NATURAL RESOURCE MANAGEMENT FROM A CONFLICT PREVENTION PERSPECTIVE

Yoshitaro Fuwa*

Abstract

1. This article attempts to verify a hypothesis that collaboratively managing natural resource in a way to achieve a positive-sum (Win-Win) game among countries or stakeholders within a country ("collaborative natural resource management"), can facilitate confidence building and, thus, can be an important mean for conflict prevention.
2. The hypothesis is tested by examination of specific cases: international river management in Europe; Jordan/Israel Peace Treaty and water resource management; land and forest management in Indonesia and India. The results show that a collaborative natural resource management among countries or stakeholders within a country can promote a positive-sum (Win-Win) game and such process itself facilitates confidence building and conflict prevention. Collaborative natural resource management, however, is not a necessary or sufficient condition for conflict prevention. It is a facilitating factor. For conflicts to be prevented, political commitment of countries or stakeholders is indispensable and such commitment should be translated into practice by multi-faceted efforts.
3. Research institutions, donors and NGOs can play an important role in conflict prevention by providing data and information relevant to collaborative natural resource management, facilitating dialogues among countries and stakeholders, and indicating possible support, technical and financial, by presenting beneficial effects of positive-sum game that can be brought forward by collaborative natural resource management.

Introduction

India and Pakistan carried out nuclear tests in May 1998. All provisions of new grant and ODA loan assistance were suspended, except for humanitarian projects. (This measure was later cancelled following the September 11 attacks and the international reactions that followed in Afghanistan and neighboring countries.) Was it really necessary for India and Pakistan, two countries facing the same problems of poverty and the environmental degradation, to conduct nuclear tests? Have these acts (the nuclear tests) taken for the national security really contributed to the benefit of the people? Rather, the two countries should work together to tackle their common problem of poverty, and to collaborate in managing natural resources such as water and forests. In doing so, they could build confidence, cut their defense expenditures, including nuclear expenditure, and apply more of their limited human and financial resources to poverty reduction and the sustainable management of natural resources. Furthermore, couldn't the management of natural resources such as water and forests lead to the prevention of armed conflicts between and within countries? What are the conditions for the countries and people concerned to realize a Win-Win result from a positive-sum game (rather than a zero-sum or a negative-sum game) in natural resource management? What is needed in order to reach such conditions? These are the key issues addressed in this paper.

In another paper entitled "Environmental Security and Regional Cooperation: The Conditions for Confidence Building and the Role of Donors", co-authored with Yasutami Shimomura, the author

* Professor at the Graduate School of Environmental Management, Hosei University, Tokyo (at writing: Senior Economist, JBIC Institute)

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conducted a review of arguments on environmental security and concluded with the following statement: "Debates and experimental research have addressed environmental security from various aspects, but insufficient attention has been given to compiling and analyzing concrete examples in which the collaborative management of natural resources and the establishment of a positive-sum game have led to conflict prevention". (Shimomura and Fuwa, 2001). This paper will examine the examples of conflict prevention through natural resource management that were raised in the above paper, and will add a further example of forest resource management in Indonesia, to consider the conditions for a positive-sum game in natural resource management.

Natural resources include mineral resources such as oil, iron ore and diamonds, but this paper will deal with management of resources such as forests and water, which can be more easily linked to conflict prevention.

The basic hypothesis of this paper is that managing natural resources such as water and forests in a positive-sum game leads to confidence building among the stakeholders involved, be they individuals or countries, thereby preventing armed conflicts, or at least mitigating the various latent factors behind antagonism among them. Chapter 1 examines international river management in Europe and the peace treaty and water management agreement between Israel and Jordan. Chapter 2 focuses on forest management and land use in Indonesia and in India from a perspective of domestic conflict prevention.

The functionalist approach in international relations theory is useful in considering this issue. It takes the view that international cooperation in many fields leads to improved political and diplomatic relations between countries and their consolidation and thus contributes to international peace. European integration based on this approach has accumulated a number of collaborations in many sectors among former enemies, leading to its evaluation as "the most successful conflict prevention of the last half century". It is a typical success-story for the functionalist approach.

On the relationship between environmental degradation and conflict, Dokken of Oslo University points out that "international environmental degradation can not only be a source of acute conflict, but also an incentive for co-operation between states. Perception becomes a central concept. Unless politicians recognize environmental deterioration as a threat and a matter of interdependence, these problems will evolve into such a significant integrative potential". Dokken adds "the problem in developing countries is that there is mutual suspicion among the politicians and a general lack of political will. The lack of political will could of course also be explained by the lack of perception of a 'community of interests' or of a common threat".[1] Dokken's view is that countries could build cooperative relationships to address environmental constraints and problems. Sharing a same perception and conducting a joint collaboration can yield mutual benefits. Furthermore, the process of repeated dialogues to investigate the potential for cooperation can, in itself, encourage confidence building. From this perspective, the author will analyze cases in which the countries, and stakeholders within countries, have collaborated in natural resource management to realize a positive-sum game and achieve confidence building. The conditions for success in such efforts (including the role of donors) will also be examined. As seen in the EU integration process and elsewhere, this kind of approach can be applied to actions on the problems caused by global warming, and in many fields, such as science and technology, public health and trade cooperation. This paper, however, will mainly focus on water and forest resources. Furthermore, for reasons of limited time availability, the author has drawn on secondary documents from domestic and external sources to demonstrate and verify the described hypothesis. Therefore the reader should note that the analysis of individual cases below has been constrained by the lack of field visits by the author.

1 Dokken 1997

Chapter 1
International Water Resource Management and Conflict Prevention

This chapter examines water issues in Europe and the Middle East as examples of how cooperation in international water resource management has led to confidence building. Of course, only cooperating for water resource management is not, in itself, sufficient to build confidence. The author believes that, as shown in the series of processes in European union and relations with the former Soviet Union and Eastern Europe that led from the Conference on Security and Cooperation in Europe (CSCE) to the Organization for Security and Co-operation in Europe (OSCE), building collaborative relationships in many fields, including water resources, leads to confidence building[2]. This chapter will, however, focus on water resource management, which will become increasingly problematic in the 21st century and is often regarded as a zero-sum game. It is hoped to demonstrate, through examples, that collaboration is possible even in this field, and that the resulting confidence building can avoid the negative sum game of war and terrorism, which wastes land and lives and deepens mutual distrust. The positive-sum game of effective water resource management and confidence building can lead to economic progress and further confidence building.

Before looking into the case studies, an overview of the management of international water resource (river) management will be presented here.

It is estimated that there are 264 international rivers in the world with river basins shared between multiple countries. Their catchment areas occupy around 45% of the world's continental land area[3]. As of the end of 1997, there were 145 international treaties concerning the use of international rivers, of which 124 (86%) were bilateral, and 13 were between developing countries[4]. International agencies have been involved in treaties on international rivers in developing countries, including treaties concerning the Mekong, Zambezi, Indus and Ganges Rivers[5]. In developed countries, problems of international river management commonly involve cross-border river pollution, but in developing countries that kind of problem is preceded by contention over water shortages and the diversion of flow for applications such as irrigation. (See Table 1).

It is said that there has never been a real war over the use of international rivers, but as growing populations in developing countries and ongoing development will increase water demand, the use and management of international rivers is expected to become increasingly problematic. This paper will examine two cases relevant to this situation. The first is that of Europe, in which the idea of collaborative joint management of international rivers has been developed and refined over many years, and offers many lessons relevant to this paper's perspective . The second is the water issue between Israel and Jordan, in which discussions on water management helped successful conclusion of the peace accord.

2 Fuwa, 2001b
3 Swain, 2002c p1
4 Beach, H.L. et al., 2000 p47-51
5 For more details of these cases, refer to the papers by Prof. Mikiyasu Nakayama in the references.

Table 1 International River Basins, Related Countries, Their Problems and Related River Basin Agencies

International river basin	Related countries and issues Vol.: Shortage of water volume Use: Issues of use, diversion and sharing Pol.: Pollution problems	Related river basin agencies and main international institutions involved in coordination
Jordan	Israel, Jordan, Syria, Lebanon, Palestine (Vol., Use)	Yarmouk Committee (Jordan, Syria) Orontes & South Cebir Comm. (Syria, Lebanon)
Gaza, West Bank Aquifers	Israel, Palestine (Vol., Use)	
Tigris and Euphrates	Turkey, Syria, Iraq (Vol., Use)	Tigris - Euphrates Joint Technical Committee
Amu Dar'yan & Syr Dar'ya	Uzbekistan, Kyrgyzstan, Kazakhstan (Vol., Use)	International Water Supply Coordinating Committee (concerning the Aral Sea and Kazakhstan)
Minho, Douro, Tejo, Guadiana	Portugal, Spain (Vol.)	International Committee between Portugal and Spain
Rhine	France, Germany, Holland (Pol.)	International Committee to Protect the Rhine against Pollution (ICPR)
Danube (Donau)	Hungary, Slovakia, Germany, Austria (Pol., Use)	Danube Committee (International Committee for the Protection of the Danube River)
Szamos	Hungary, Romania (Pol.)	Romania- Hungary Hydrotechnical Commission
Salwan/Nu Jiang	Myanmar, China (Vol.)	
Mekong	China, Myanmar, Thailand, Laos, Cambodia, Viet Nam (Vol., Use)	Mekong River Commission (China and Myanmar are not included), UNDP
Han	South Korea, North Korea (Use)	
Ganges	India, Bangladesh (Vol.)	Indo-Bangladesh Joint River Comm., UN
Mahakali	India, Nepal (Vol., Use)	
Indus	India, Pakistan (Vol.)	World Bank
Parana	Argentina, Brazil, Paraguay (Use)	Programme Paraguay-Parana
Lauca	Bolivia, Chile (Use)	
Great Lakes region	USA, Canada (Pol.)	International Joint Committee
Rio Grande	USA, Mexico (Pol.)	International Boundary and Water Comm. (IBWC) Rio Grande
Colorado	USA, Mexico (Pol.)	
Nile	Egypt, Sudan, Ethiopia (Vol.)	Council of Ministers of Water Affairs of the Nile Basin Countries (COM)
Sahara aquifer	Libya, Egypt, Sudan (Vol.)	
Lake Chad	Nigeria, Chad, Cameroon (Use)	Lake Chad Basin Comm. (LCBC)
Orange	South Africa, Lesotho (Vol., Use)	SADC (South African Development Community) of Orange River Basin Comm.
Zambezi	Zambia, Zimbabwe, Mozambique, South Africa (Vol., Use)	SADC Joint River Basin Committee, Zambezi River Authority, UNDP (United Nations Development Program)
Okavango	Namibia, Botswana, Angola (Vol.)	Okavango River Basin Comm.(OKACOM)
Senegal	Senegal, Mauritania (Vol.)	Senegal River Development Organization
Lake Victoria	Uganda, Kenya, Tanzania (Vol.)	Lake Victoria Environmental Management Programme

Source: Prepared by the author from Ashok 2002 d p6 Table 2, Corria 4 da Silva 1997 and theses by Nakayama cited in the references.

(1) The European Example of International River Management

There are 31 major rivers in Europe, of which 18 are international rivers flowing through two or more countries. Control of their water volume and quality, and the reliability of that control in upstream countries, have a serious impact on downstream countries.

There are four main approaches to sovereignty over international rivers.[6]

a) A country can freely use any river within its borders, regardless of the impact on other countries.
b) Upstream countries are prohibited from using water in ways that impacts downstream countries.
c) Upstream countries are permitted to use water in equitable and reasonable ways, while respecting the rights of downstream countries.
d) The co-riparian countries prepare an integrated river basin water utilization plan transcending national boundaries.

Of these, a) and b) are patterns of egocentric behavior by the countries concerned, viewing water resources as a zero sum game. The extension of this approach could lead to conflict.

Approaches c) and d) are more collaborative. If d) is followed, collaborative action on water use could strengthen confidence building, even if the amount of available water is unchanged. The preservation of good relations between countries, without resorting to conflict, can lead to stronger cooperation in fields other than water, producing a positive-sum result overall.

In this regard, it is worth reviewing the history of international river management in Europe.

International rivers such as the Rhine and the Danube started to become the subjects of conflict in the early 19th century, but the 1911 Madrid declaration of the International Law Institute put forward the idea that "rivers are joint property of all riparian countries". The International Law Association (ILA) drew up the Helsinki Rules for the rational and equitable use of water resources in 1966, and the Rules were later adopted by the Hague International Court. The 1972 European Community (EC) Summit, which took place just after the Stockholm Conference on Environment, based upon rising concern over the environment, concluded that "it is convenient to prevent activities pursued in a country from causing environmental damage in another country", and also that "important aspects of environmental policy must not, in the future, be planned and implemented individually in each country" (i.e. they should consult with their neighbors).

Between 1973 and 1977 the "International Committee to Protect the Rhine against Pollution" and the "European Convention on the Protection of International Water Resources against Pollution" were established to address the worsening problem of cross-border pollution in the Rhine. On July 25, 1977, the European Council ratified the "Convention on the Protection of the Rhine against Chemical Pollution". Germany and Austria reached an agreement in 1994, under EU auspices, for the protection and sustainable use of the Danube. When Greece, Spain and Portugal entered the EEC, it raised new problems of water quality control in international rivers. In December 1995 the EU reached an agreement to promote coherent EU water management.

Thus, European countries reached the approach d), of those above, after a period of over 80 years from the International Law Institute's 1911 Madrid Declaration. In the process, EU countries pursued a great number of discussions and negotiations, but the important thing is that, in doing so they reached an awareness that "comprehensive river basin management of international rivers yields benefits for all countries in the basins". In this sense the example of international river management in Europe can be viewed as an example of how "collaboration between multiple countries, working for a common goal within a positive-sum game, has furthered confidence building between countries, leading to conflict prevention".

The following factors have been instrumental in promoting cooperation within Europe:

6 Corria & da Silva 1997 p319

[1] Strong political commitment to cooperate.
[2] there were strong secretariats that could deal with the administrative works necessary to achieve cooperation.
[3] Scientific research systems to conduct objective study of the issues were well developed.
[4] Research results were shared between countries and agencies and thus cooperation was built on a common knowledge base.
[5] The transport and communications infrastructure was in place to facilitate effective discussions.

These are points that donors should pay close attention to in future as they provide assistance to promote similar cooperation in developing countries.

(2) Water Issues and the Israel - Jordan Peace Accord

Of the 17 environmental critical flashpoints that could lead to regional instability in the world over the next two decades six are focused on water and three of those are in the Middle East.[7]

The Jordan River basin is a classic example of such a region, where water and security are closely intertwined, and water is a central issue in Israeli-Palestinian tension. The statement by the late King Hussein of Jordan that "water is the sole cause for war between Israel and Jordan" comes to mind.

For Israel, the only sources of water are surface water in the Jordan River and groundwater from the West Bank. In the 1950s, the Johnston Plan was proposed for a comprehensive and collaborative use of the Jordan River, but mutual distrust between the four countries of the river basin (Israel, Jordan, Lebanon, Syria) prevented its realization.

West Bank groundwater accounts for around 40% of Israel's water supplies, but the Palestinians, who account for over 90% of the region's population, only use 4.5% of its water, with 95.5% going to Israel. This inequality in water use is one cause of Palestinian resentment against Israel, and a major factor behind regional instability.

Israel and Palestine are still far from reaching a peace agreement, and hatred breeds hatred through Palestinian suicide bombings and Israeli retaliation. The negative impact of this situation extends to the economies of both sides, reinforcing a classic negative-sum game.[8] In contrast, Israel and Jordan have managed to avoid such a situation by reaching a peace accord, of which collaborative water management was a central pillar. The relationship between Jordan River water resource management and the peace treaty between the two countries will be considered below.[9]

The Jordan River basin is one of the regions with the lowest per-capita water availability in the world, and its water problems tend to be seen as a classic zero-sum game. This situation has been exacerbated by years of Arab-Israeli antagonism. However, Israel and Jordan, in a state of war under international law since the first Arab-Israeli war in 1948, concluded a peace treaty, including a comprehensive bilateral water supply regime, on October 26, 1994.

According to the functionalist school of international political science, countries can cooperate in "low politics" fields such as resource management even when they are politically antagonistic, and the resulting increase in interdependence of welfare of the nationals of the two countries leads to conflict prevention. That view was the theoretical basis of the Johnston Plan in 1955, and the US-mediated series of talks based on that proposal in the 1970s and 1980s, but the process failed in the face of fierce political antagonism.

This experience led researchers of the realist school of thought to assert that cooperation on the low politics level, for economy and welfare, including water, is not feasible unless the antagonism at the high politics level of war and armed conflict will be solved.

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7 DAC/WPDCF p39

8 It is not directly related to the management of natural resources, but the establishment of Middle East and North Africa Development Bank was agreed on to assist the Israel-Palestinian peace process, based on the Oslo Accords. The subsequent deadlock and deterioration of the peace process meant that it never went into operation, and it can be viewed as an example of the negative-sum game. This case was examined in more detail in Fukuda 2001.

9 This section draws heavily on Libiszewski, S. (1997), and on the Israel - Jordan Peace Treaty (which can be accessed from the Israeli Foreign Affairs Ministry homepage as shown in the references).

However, none of the direct political attempts to resolve Arab - Israeli conflict in the Middle East achieved success, except for the peace reached between Israel and Egypt in the late 1970s. The successful conclusion of the Israel - Jordan Peace Treaty thus suggests an important potential of a new approach.

The above mentioned 1955 Johnston Plan presented to Israel and Jordan (and also to Syria and Lebanon, i.e. other riparian countries) water allocation plan as shown in Table 1 "The 1955 Plan", with a view to comprehensive development and integrated water usage in the riparian countries of the Jordan and Yarmouk River. The technical committees set up in each of the countries concerned reached agreement, but all of these countries but Israel felt that acceptance of the plan would be tantamount to an acceptance of the existence of a Jewish state. They also felt that it was overall relatively more favorable to Israel. Thus, the plan was not implemented. In 1967, during the Six-Day War, Israel destroyed a dam Jordan was building on the Yarmouk River. At the same time it took the Golan Heights, gaining control of the upper reaches of the Jordan River and northern shore of the Yarmouk, including the area facing the water intake for the King Abdullah Canal. Since then, Israel has come close to practically monopolizing the water of the Upper Jordan. Despite the fact that the Johnston Plan would have granted Jordan the use of 100Mm3 of water, it was excluded from use of water from the Jordan River. This situation continued until the peace accord was signed between the two countries in 1994. (Table 2). On the Yarmouk River, Jordanian efforts to improve water supply to the King Abdullah Canal by building a reservoir, were impeded by frequent shelling by Israel, in occupation of the Golan Heights. Israel has also occasionally disrupted maintenance work on the water intake for the King Abdullah Canal.

After negotiations lasting approximately three years, Jordan and Israel signed a peace treaty on October 26, 1994, marking a highlight in the current

Table 2 Water Distribution Between Israel and Jordan

Units: million m^3 (Mm^3)

	Israel	Jordan	Timing of implementation etc.
<Jordan River>			
Values proposed in '55 (Note 1)	375	100	
Before the peace treaty	550	0	
After the peace treaty	550		
		+10	Desalinated springs around Lake Tiberias. (Immediate implementation)
		+20	Dam on the Lower Jordan. (Long term)
		(+40)	From Lower Jordan. (Timing of implementation not yet determined. Long term)
		(Note 2)	
<Yarmouk River>			
Values proposed in '55 (Note 1)	25	377	
Before the peace treaty	70	130	
After the peace treaty	25-70	130	Existent
		+20	Lake Tiberias (Exchange/immediate implementation)
		(+25)	By existing facilities(Immediate, amount insecure).
		(+50)	From planned dam. (Long term, amount insecure)
<Arava Valley>			Not considered in the '55 plan.
Before the peace treaty	8	4	
After the peace treaty	8-18	At least 4	Within five years.
<Additional water resources to be developed after the peace treaty>		+50	Sources yet to be defined. Very long term, highly insecure.
<Totals>			(Israel - Jordan total)
Before the peace treaty	628	134	762
After the peace treaty	593-638	At least 349	942 ~ 987

Note 1: "Values proposed in '55" are the average annual water usage values proposed in 1955 by special envoy Eric Johnston, appointed by the US president in the early 1950s and aimed to build confidence by drawing up a comprehensive development and water use plan for the countries of the Jordan River basin.

Note 2: Figures in parentheses are not explicitly mentioned in the treaty. They are based on declarations of Jordan's chief water negotiator Munthir Haacin quoted in the Jordan Times dated 18th of October 1994.

Source: Prepared by the author with some calculations based on Libiszewski, S., 1997, p390 Table 2.1 and p397 Table 4.1.

Middle East peace talks. The solution of the water problems between the two countries was of central importance to the treaty. In the treaty text, the water issue (Article 6) comes first among a series of specific fields (economy, refugees, access to historically and culturally important sites, cultural and academic exchange, transport, tourism, energy etc.). Article 6 is based on the view that the water subject can form the basis for advancement of cooperation between the two countries. It called for a joint undertaking to ensure that the management and development of their water resources do not harm the interests of either country (Clause 2), regional-level development of new and existing water resources to cope with water shortages, the prevention of pollution, and joint research and information sharing (Clause 4). Annex II to the treaty, which determined details of water allocation, provided that neither country would engage in projects, without prior agreement, that could change flows in the Jordan or Yarmouk Rivers (Annex II, Article V), and stipulated to establish a Joint Water Committee to promote implementation of the treaty (Article VII).

Under the terms of the treaty, as shown in Table 2, Jordan's water share from the Jordan River increased while Israel's share remained the same. Israel's allocation from the Yarmouk was reduced and Israel dealt with the loss by better water management taking into account seasonal water demand. Overall, in a simple comparison, the water availability for Israel was reduced by the peace treaty. This means that Israel chose the larger benefit of peace and security by ceding some water allocation. Furthermore, building dams and reservoirs necessary for bilateral water management are conceived in the treaty, as deliberately constructing a relationship of interdependence to help consolidate the foundation of the peace between the two countries. This is an approach yielding a positive-sum game through measures such as joint construction of dams and desalination plants.

The key to reaching the peace agreement between Israel and Jordan was the existence of parallel second track negotiations, in which practical works on low politics issues such as water resource management, refugees, environment and regional development went alongside the high politics of mutual recognition, land and security. The progress in the former, such as water, positively affected the advancement in the latter, leading to the successful signing of the treaty. . It was important that the negotiations on the second track included multilateral collaboration and support, with the participation of many actors. For example, the second track negotiations in low politics fields, begun in January 1992, over two years before the treaty, had the participation of US Secretary of State Baker,, Middle Eastern and North African countries and donors from the US, EU, Japan and Northern Europe. These parties were involved in seven rounds of multilateral talks. For the sake of confidence building, representatives of Jordan and Israel also participated together in study tours on Colorado River basin management and regional training programs (integrated water management based on international law, campaign methods to raise public awareness about water, etc.). Efforts included studies of the region's water-related laws and institutions,, desalination technologies, regional water demand and supply analysis, and a joint Israeli-Jordanian feasibility study on the construction of a canal between the Red Sea and the Dead Sea. These were all intended to nurture a vision of common benefits, and they made a substantial contribution to the peace negotiations by bringing tangible benefits to be derived from these projects into the horizon of negotiators at the high politics level. Thus many of these projects, which were deliberated on in multilateral discussions proceeding in parallel with the peace talks, showed the participants in the talks the specific and concrete benefits that could be achieved in peace, thereby indirectly promoting the peace negotiations. In this process, the support of the international community, such as donors, NGOs, scholars from developed countries and international agencies, played an important role in offering ideas and assisting multilateral talks..

(3) Summary

A number of lessons can be drawn from these examples of Europe and the Middle East.

[1] The agreements to protect the Rhine and Danube against pollution deliberately created relationships of mutual dependence among riparian countries based on a common vision that "integrated river basin management of

international rivers will benefit all riparian countries". In this process it is important to see the concept of a positive-sum game in the joint management of natural resources, and back it with political commitment to pursue that kind of cooperation.

[2] As the Israeli-Jordanian peace process showed, political-level talks over the high politics issues such as mutual recognition, land and security between antagonistic countries can proceed in parallel with talks in low politics fields, such as water resources. Studies can be conducted for identifying and promoting specific projects of benefit to both countries. The results of the studies, if properly fed back into the high political talks, can contribute positively to a success in the high politics field, i.e.: reaching a peace treaty.[10]

[3] In examples [1] and [2], the process of conducting researches, sharing the findings, deliberation on specific policies and joint monitoring of implementation will, in itself, lead to confidence building.

[4] International society, i.e., donors, NGOs, scholars from developed countries and international agencies, have an important role in proposing ideas on fields and specific projects for collaboration, and providing technical and financial assistance for their implementation.

[5] The process of collaboration requires large amounts of time and effort, so it is important to support capacity building for those involved in the process.

[6] The development of transport and communications infrastructure is important to allow the collaboration process to move forward efficiently.

It should be emphasized that these points are also applicable to the following discussion of domestic natural resource management and conflict prevention.

Chapter 2
Domestic Natural Resource Management and Conflict Prevention

(1) The Significance of Examples

So far we have examined examples of cooperation that have centered on international water resource management, and seen that collaboration for the sustainable use of water resources can lead to inter-state confidence building. Can the same approach be applied to an intrastate conflict prevention in developing countries?

A wide array of actors are involved in internal conflicts in developing countries. There are entanglements among various interests, and numerous conflict factors, such as national borders and social relationships set up in the colonial era, population increase, poverty, and differences of ethnicities, languages and religions. This chapter will focus on natural resources such as forests and land, on which the rural people representing the majority of the poor in developing countries crucially depend in their daily livelihoods. The questions of who manages these natural resources and how they are managed are important for conflict prevention.

The examples covered here have not experienced serious armed conflicts. They were rather selected from a natural resource management perspective to identify factors which prepare the grounds for conflict and illustrate what can be done to remove those grounds. Thus even regions that appear, on the surface, to be living in peace, can contain inequalities in the undercurrents of society, in aspects such as access to land and forest resources. When these are linked to ethnic problems and changes in structures of governance (i.e.; shift from a centralized power structure towards decentralization or an introduction of democracy, etc.), trivial incidents can trigger explosive and violent conflicts. This process was observed in the ethnic cleansing of Madurese by Dayaks on Kalimantan, Indonesia at the start of 2001.[11]

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10 Even if water resources are described as "low politics", it is a highly important field with a gravity close to that of high politics. In this paper, however, it is positioned as low politics.

11 Shiraishi (2002) analyzed this superbly with reference to the natural resource management aspects of ethnic and religious conflicts in Kalimantan and Maluku, Indonesia,.

This paper will examine the natural resource management that can become one of the root causes of such explosive conflicts, and see whether a collaboration towards a positive-sum game is possible. Such collaboration could overcome short-term conflict of interests among the stakeholders and secure their long-term coexistence and improved living standards, while preserving natural resources. Success in one community may be replicated in others. While caution is required, if the parties concerned jointly work in this direction, sharing information and conducting patient discussions, and arrive at a solution that will bring benefit to a broad range of parties, such solution, implemented with the assistance of donors if necessary, will build confidence among stakeholders and it will have a far-reaching influence beyond the community directly concerned. This is what is suggested throughout the examples considered below.

(2) Example of Environmental Management in Nusa Tenggara, Eastern islands of Indonesia

[1] An overview of Nusa Tenggara region

In the second half of the 1990s, a group including Professor Larry Fischer of Cornell University spent over three years studying natural resource management in the islands of Nusa Tenggara in eastern Indonesia, and the related conflicts.[12]

The islands, lying southeast of Bali in Indonesia and north of Australia, has long been called Nusa Tenggara. Administratively it has been divided into three regions, Nusa Tenggara Barat, Nusa Tenggara Timur and East Timor, which is a former Portuguese colony and which has now become an independent country (see Figure 1). It has a population of 8.12 million, composed of various ethnic groups with over 50 languages. Remote and lacking infrastructure, Nusa Tenggara has been one of the poorest and least developed regions of Indonesia. Income levels are one third of the Indonesian national average, and rates of infant mortality and illiteracy are the highest in the country. The economy is centered on agriculture, growing crops such as rice, maize and cassava, together with pasture for water buffalo, horses, goats and other livestock. Crops such as timber, coffee, cocoa and tamarind are important sources of cash income, and micro-scale industries such as coastal fishing, food processing, textiles and leather, together with tourism, are becoming an increasingly important sector.

[2] The nature of the problems

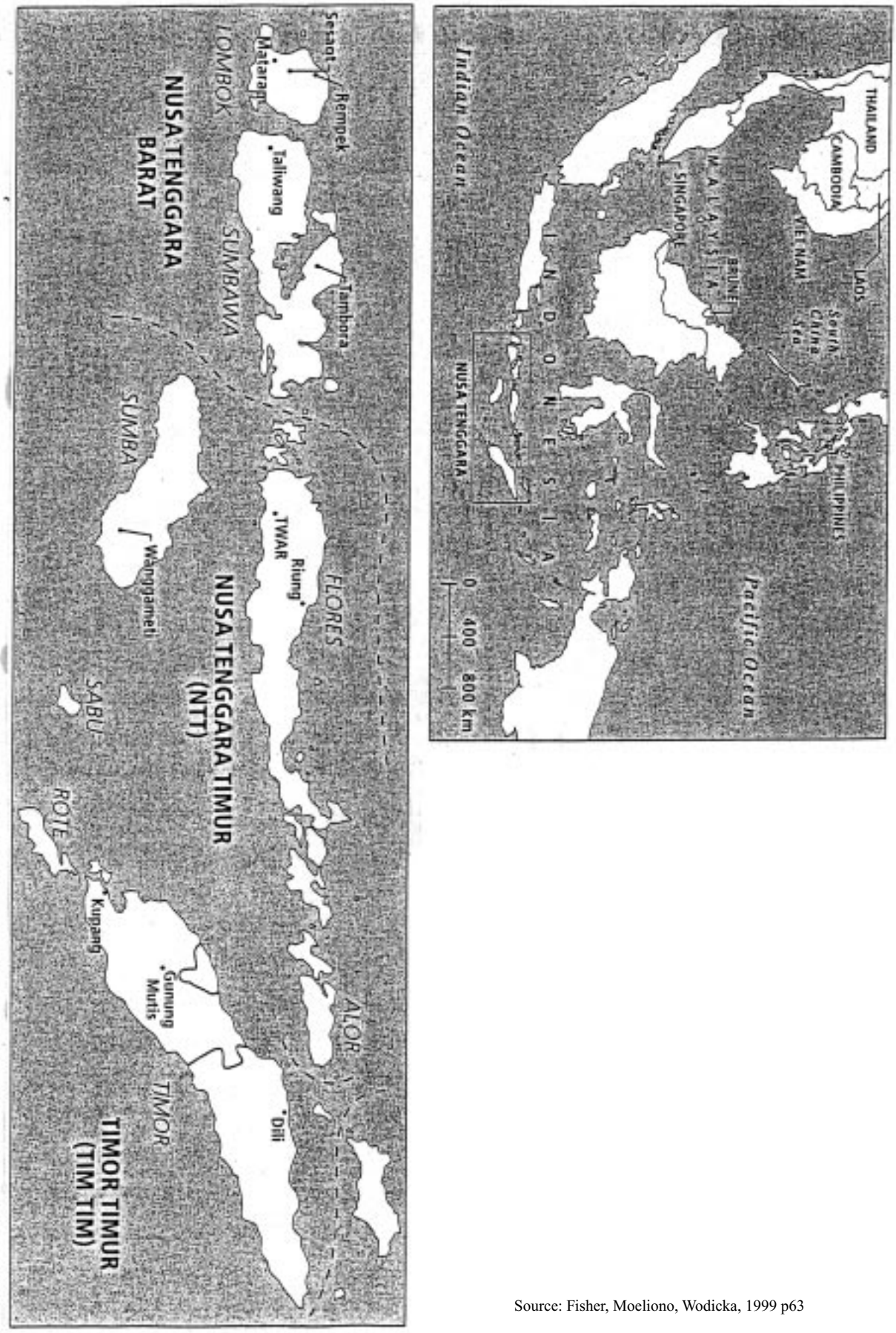
Since the early 1980s, the UN Food and Agriculture Organization (FAO) and the Indonesian Ministry of Forestry, joined later by international environmental NGOs, have been studying the biodiversity of the Nusa Tenggara region, and preparing conservation plans and education. These efforts have revealed the rich biological, cultural and ethnic diversity of the region, but at the same time the chronic poverty of the region was recognized as a major task for natural resource management. In the forests and other natural reserves there are many communities with traditional values and customs, and groups whose livelihood depend on specific ways of using the land and forests. There were permanent struggles over land and forest usage.

Table 3 describes the main problems and their countermeasures in several zones. The diverse actors and problems identified in each region can be broadly grouped into four problem patterns.

The first is the problem of coordination among the interested parties. The Ministry of Forestry has a comprehensive authority over forests, but its authority is also entwined with other central government agencies in areas such as agriculture, tourism, public works and agricultural development. This situation makes it difficult to draw up comprehensive and consistent plans and implement them down to the smallest elements of regional government. In some cases adequate coordination between the parties and effective decision-making are impossible in matters such as forest boundary lines, land usage and forest conservation activities. The second problem concerns implementation schemes. Policy formulation and project implementation are under central control, and therefore they do not fully reflect local conditions. Those involved at the local level lack information and

12 Fisher, Moeliono, and Wodicka 1999

Figure 1 The Nusa Tenggara Region and Priority Conservation Area



Source: Fisher, Moeliono, Wodicka, 1999 p63

Table 3 Problems and Countermeasures in Natural Resource Management in Areas of Nusa Tenggara

[Nusa Tenggara, Lombok Island, Sesaot Village]

Problems	Solutions
A change in the status of the forest (from limited protection forestry to protected forestry) made it impossible to cultivate coffee and vanilla. The change was made because an irrigation project was planned for an arid region in the south of the island and the regional government decided that the forest should be protected as the water source for the project. Coffee cultivation in a buffer zone is taxed at 50%. Gathering of firewood and construction materials is also restricted.	A participatory study in April 1993 by LP3ES (a local NGO) developed relationships with village leaders. As a result, community development activities, involving irrigation construction, farmers' working groups and consumer cooperatives were conducted, and a forest conservation partnership was formed to prevent theft from the forests, and corruption and harassment by officials.

[Nusa Tenggara Timur, Sumba Island, Wanggameti National Park]

Problems	Solutions
Slash-and-burn agriculture had reduced the island's forested area by 10%, putting its function as water source forest at risk. Nine species of wild birds in the national park were unique to the island, and were in danger of extinction due to habitat loss, hunting and trade. Two villages inside the park and 15 more around it depended on the forest for firewood, building materials, dyes and medicinal plants. The latter villages also grazed livestock extensively. The mountain in the reserve is sacred ground with strict traditional restrictions on its use, but there was the possibility of development within the park to promote tourism in Nusa Tenggara and build road and communications infrastructure. Tree planting by the forest service failed due to poor soil, drought, forest fire and opposition from local people. When the regional government forcibly relocated some of the villages, it provoked severe criticism and a resistance movement by other villages and local and foreign NGOs.	To respond to criticism and avoid escalation of violence, participatory studies and collaborative planning were introduced from 1993. A natural resource management coordination team from the NTCDC served as facilitators between June 1996 and July 1997, helping government and civil researchers, NGOs and others to conduct surveys and debates in ten villages around the park. The information and recommendations gained from these studies and public debates led to the holding of a regional meeting in July 1997 with the participation of a more diverse range of stakeholders. As a result, the Wanggameti Conservation Area Forum was established as a union of the various agencies and stakeholders involved, and recommendations were adopted for land usage and management, nature conservation activities and coordination with government-related agencies.

[West Timor, Gunung Mutis Reserve]

Problems	Solutions
There were two villages inside the reserve and 14 around it. The soil in the reserve was rich and its rainfall was suitable. Grazing of livestock in the reserve impeded forestry conservation. The WWF and the Department of Forestry's Centre for Natural Resources Conservation (BKSDA) proposed the prohibition of grazing within the reserve. No comprehensive management plan had been drawn up for the reserve, and coordination between the stakeholders was inadequate. The local government prioritized development, while the national government prioritized nature conservation.	The BKSDA and the local forestry agency carried out education and extension programs, community development and tree planting activities to involve the local villages in forest conservation. The WWF conducted a survey of biodiversity and socio-economic conditions, drew up maps of land boundaries and usage, monitored forest fires and organized farming villages. A participatory survey is planned that will involve all stakeholders related to livestock grazing and land use in the reserve.

Source: Prepared by the author from Fisher, Moeliono, Wodicka, 1999, p65~70.

cannot influence decision-making processes. This, coupled with the above-mentioned coordination problem, means that the programs by the Ministry of Forestry and NGOs are sometimes too limited in scope, without the ability to consider various elements and make an integrated response. Local governments should really be in charge of coordination, but in many cases they are not backed by sufficient authority, implementation capacity and experience. The third problem is the contradiction between environmental conservation and people's livelihoods. Despite various regulations and educational outreach programs, the local people practiced encroachment by farming, illegal logging, collecting of non-timber forest products, and raising livestock The fourth problem consists of social and cultural issues. Indigenous forest management systems based on traditional culture and values stand in stark contrast to more recent government efforts to determine forest boundaries and classify forest zones based on primarily technical considerations.

[3] Countermeasures and their characteristics

New measures have been tried since the second half of the '90s to address these problems. All have been characterized by the involvement of the Nusa Tenggara Community Development Consortium (NTCDC), which pursues persistent discussions with local people and other stakeholders, and painstaking investigations, building up a history of dialogue. The NTCDC is a

network of government agencies, NGOs, research agencies and local communities. They use tools such as regional workshops to raise awareness through all parts of the community about specific measures to be taken in future, their characteristics and the kinds of cooperation needed to carry them out. They also have high officials of central government make field visits and participate in panel discussions to deepen their understanding of the nature of problems, so that central-level policy can reflect those problems. Sharing the results of accurate surveys gives the stakeholders an awareness of the complexity of situations, which can lead them away from stubborn adherence to their own interests towards a broader perspective on dealing with the issues and openness to considering creative solutions. Through this kind of process, the work of the NTCDC has succeeded in building confidence among government officials, community leaders, NGOs, researchers and others. NGOs have also moved away from positions of simply protecting the interests of single groups to work as facilitators, helping all stakeholders to reach consensus, and, thus assisting the progress of collaboration.

[4] What the examples suggest

The above examples suggest four points. First, to prevent conflicts over natural resource management, it is important to involve all the stakeholders, not just those involved locally, so that they can all share common and objective perceptions of the problems and reach a common vision and direction on how to solve them. Donors can contribute in this regard. Second, it should be recognized from the beginning that painstaking participatory research made with the participation of local people, sharing the findings, and involvement of all stakeholders in dialogue is a long process. Third, a dynamic and flexible support system is needed to ensure that the skills, expertise and funds (note) are delivered whenever they are needed. Such a system must be constructed to allow the participation of local NGOs and foreign and domestic researchers. Fourth in addition to providing ODA for conflict prevention it is important to make sure that conventional aid projects do not have inadvertent effects that promote conflict.

(Note) Local people and other stakeholders should be compensated for travel expenses and opportunity costs, to encourage them to attend panel discussions and other events that do not give them any direct and immediate benefit.

(3) Forest Management and Conflict Prevention in Kalimantan, Indonesia

In Indonesia, approximately 40 million people depend on the forests for their livelihoods, either directly or indirectly (World Bank 2001b), but all natural resources, including forests, have been under government control since independence. The 1967 Basic Forestry Law, and the 1999 New Forestry Law that revised it, both prohibit the development of forest resources without permission. Under the law, forests are divided into five categories:

[1] Protected forestry (mainly for watershed protection).
[2] Conservation forestry (national parks and other areas for nature conservation).
[3] Limited production forestry.
[4] Production forestry (for sustainable commercial logging).
[5] Conversion forestry (for management as plantations etc.).

Tree felling for commercial logging or plantation management is legally permitted in categories [3]~[5], but the law did not consider the custom-based forest ownership and usage rights of local people, who have a long-held tradition of slash-and-burn agriculture. Furthermore, the new law on regional devolution (Law 22/99) left categories [1] and [2] under central government jurisdiction, but moved [3] to [5] to local government jurisdiction.

Deforestation has been going on since the 1970s, and the Indonesian government began to realize the necessity of conserving forest resources in the mid 1980s. In 1992 it decided to work towards meeting the provisions of the Target 2000 forest conservation guidelines of the International Tropical Timber Organization (ITTO). Since then it has been looking

for more sustainable forestry policies that would give more consideration to ecological balance. This approach was the basis for the South and Central Kalimantan Production Forestry Project (SCKPFP), which began in 1999 with EU technical assistance. The project aimed to develop and replicate a sustainable forest management model, with full stakeholder participation over a seven-year period, which would meet the Target 2000 guidelines.

The site for the SCKPFP is on several concessions that have been provided in production forests in South and Central Kalimantan. In South Kalimantan, the concessionaire is PT. Aya Yayang Indonesia, which has a 55-year concession on 85,000ha in Tabalong district. The company does not use it for simple commercial logging. Instead it practices rehabilitation forestry in areas of degraded forest with a view to commercial logging in future. There are five villages (Panaan, Dambung Raya, Hegarmanah, Salikung and Kumap) in or around the concession area, and the majority of the villagers are farmers who practice traditional slash-and-burn agriculture. The farmers take the view that the forestland has been inherited from their ancestors, but the government does not recognize such customary land ownership.

Conversely, it is hard for the farmers to permit tree felling for commercial logging or plantation operation in the forests they have used for generations. For the farmers, the forests are the source of rattan, resin, fruit, honey, birds and other forest products that enriches their daily lives and provides them with cash income. Therefore excess logging erodes their livelihood base. The forests are also important for securing water sources.

The main aim of the SCKPF project was to introduce a mechanism to coordinate between the differing interests of the local people, the concessionaire and the Indonesian government. Two things have been done in the concession area for Aya Yang. The first was to draw up maps on the land use customs of the local people, with the participation of local NGOs, farmers, the staff of the SCKPF and related government agencies. The maps were then distributed to the Ministries of Forestry, Agriculture, Livestock, Fishery, local government agencies, the concessionaires and local NGOs. The second was, shortly after the maps were completed, to collect data on local traditional law and community organization, and a meeting called a Muyawarah was held with the participation of the traditional leader (adat) and community leaders. The meeting discussed solutions including the problems of slash-and-burn agriculture itself (the problem of sustainability under growing population, etc.). The aim was to achieve recognition of traditional methods by both the government and the concessionaires.

Several meetings were held with the participation of all stakeholders, leading to the solution described below, which yields a win-win situation.[13]

<Solutions>

[1] Tree felling by the concessionaires is monitored by SCKFP project staff to ensure that it does not menace the farmers' livelihood, and is limited to only western slopes.

[2] Concessionaires build roads within the region and improve market access for the farmers.

[3] Farmers support conservation of eastern forests and address the problem of illegal logging.

In this example, all stakeholders shared the same objective information, produced by careful participatory studies, discussed the solutions, made concessions to each other and searched for solutions that would ensure the survival of and benefits to all parties in the long term.

(4) Joint Forest Management in Madhya Pradesh, Central India

Madhya Pradesh has the largest land area of India's states, but economically it belongs to the poorest group. Joint Forest Management (JFM) is an attempt to form a partnership between the Department of Forestry and local communities and manage forests with shared aims. JFM was introduced in four villages in the state. Based on an analytical research[14] using the participatory rural appraisal method, the process

13 Tus. Th., 2001

14 Kant, & Cooke, 1999

and outcome of JFM introduction is reviewed below from a perspective of conflict prevention and forest conservation.

[1] The introduction of Joint Forestry Management (JFM)

Timber commercialization progressed in India during the colonial era, with increased destruction of forests, leading to the introduction of natural reserves. These two factors reduced forest access for local people. After independence in 1947, the Indian government promoted commercial timber logging, and forest access for local people continued to worsen. From the mid 1980s there was a growing awareness that forestry policies that excluded local people were intensifying animosity between the people and the forest officers. The National Forest Policy (NFP) was submitted to parliament in 1988. The basic thrust of the NFP was to seek a way to use participation by local people to solve their antagonism with the national goal of forestry conservation. In June 1990 the Ministry of Environment and Forestry issued a circular that JFM should be adopted by all states. The most crucial aspect of this circular was that the decision to place people's needs above those of commercial interests, which had previously been emphasized.

[2] The state of the target villages

The case-study targets examined by Kant and Cooke were four villages (Kundwara, Tikaria, Roriya and Jamuniya) in an area around 60km from Jabalpur, one of the major cities in the state (see Table 4). Bagaraji, a few kilometers from Jamuniya, is a large town and commercial center. The distances between the villages do not exceed 15km.

[3] The nature of the problem

The basic background to the problem is that population growth in Jabalpur and Bagaraji was increasing demand for firewood and timber. Forest near the two centers was being felled to satisfy their demand for timber, forcing people to go further afield to get timber. In the 1970s and '80s, Kundwara became the main source for timber supplies and illegal logging was rampant, reducing the forest.

Rather than buying timber from the Department of Forestry through proper channels, the timber traders of Jabalpur began obtaining it illegally from the Kol tribes who had tree felling skills, and from the Baigas tribes, traditional collectors of firewood. The Gonds were traditionally farming people who needed the forests to maintain the soil, conserve groundwater and provide nutrition. As the forest area diminished, there was growing antagonism between the Kol and Baigas tribes who profited from firewood collecting and tree felling, and the Gonds, who needed forests. A majority of the non-tribal people was economically better off landowning farmers for whom the forest was used for grazing cattle. They did not object to felling forest trees because it expanded the area available for grazing, and for pasture inside the forest.

Forestry resources were officially under the control of the state government, but in practice they were used as an open resource. As a result, the problem of forest destruction came to the attention of the villagers and the Department of Forestry officials from the mid 1980s.

Table 4 Summary of Villages Near Jabalpur in Madhya Pradesh State in India

	Kundwara	Tikaria	Roriya	Jamuniya
Population	248	624	312	286
Tribes	Gonds (traditionally farmers). Only seven non-Gonds	Baigas (a tribe that traditionally collected firewood. In addition, 125 non-tribal people).	Gonds (Also 9 non-tribal people).	Kol (a tribe that traditionally fells trees. 20% of the population is from other tribes or non-tribal).
Forest area (ha)	303	300	70	303
Agricultural land area (ha)	88	383	182	93

Source: Prepared by the author from Kant, & Cooke, 1999, p85-86

[4] Solution: The introduction of Joint Forestry Management

In 1989 acute resource shortages caused by a large forest fire at Roriya brought together village elders to confer on the problem and out of this came a "self-initiated" forest protection committee. The Department of Forestry became aware of this step taken by Roriya, and the Ministry of Environment and Forestry issued a directive dated June 1, 1990 calling for the introduction of JFM in all states. The state directive on the introduction of JFM from the state government of Madhya Pradesh caused JFM to be introduced in the region. Between 1992 and 1994, JFM was also introduced in Tikaria and Jamuniya, with the establishment of Forest Protection Committees (FPC) or Village Forest Protection Committees (VFPC). The Madhya Pradesh Forestry Project began in 1995, with support from the World Bank and leading donor countries. Later, the above-mentioned committee in Roriya was formalized as a VFPC, and an FPC was established for Kundwara.

[5] The substance and results of Joint Forest Management (JFM)

Forest Protection Committees (FPC) and Village Forest Protection Committees (VFPC) are established by state ordinance, and Department of Forestry staff and community members work together to protect the forest (prohibiting commercial logging, preventing forest fires, prohibiting livestock grazing in the forest) and manage non-timber forest products. The state government sets guidelines for management rules, but villages are permitted to set their own rules to suit their local conditions. For example, in Jamuniya the committee does no enforce a ban on the commercial harvest of firewood[15]. The aim is to set forest management rules that will be acceptable to the widest possible range of the local people, and thorough discussions between all interested parties, including the local people, serve to promote mutual understanding.

The income of FPC/VFPCs comes from membership fees, payments from the Department of Forestry for forestry protection work, fines collected from rule breakers and charges paid by those who collect non-timber forestry products and sell it to merchants. Income is pooled and used after discussions among the people. To date the money has been used for purchases such as musical instruments, microphones and amplifiers, seating mats and cooking utensils for meetings, and other equipment. These purchases have helped to strengthen community bonds. The money has also been used as a seed-money for micro-finance, which provides loans at lower interest rates than usurious village loans. These loans are often used for ceremonies such as weddings and funerals, medical expenses for sudden illnesses, and the purchase of farming materials. Loan sizes are determined taking account of the borrower's earning and repayment capacity. Even though the loans do not reach the extremely poor, the credit scheme is widely used among ordinary poor farmers.

Thus the pooling and use of funds lifts the community's pride in itself, strengthens its bonds, and local people increasingly appreciate the legitimacy of the FPC/VFPCs. Both committees are becoming active in fields beyond tree planting, and they are starting to functions as forums for discussing various issues in village life. Thus the social trust within the villages was enhanced and the number of drunken fights has decreased.

[6] What the example suggests

Under Joint Forest Management (JFM), the community bears the responsibilities and shares the benefits of forestry management. The crucial factor in JFM is coordination between the State Department of Forestry (forest managers) and the community, and among stakeholders within a single community and in different communities.

The examples of the villages reviewed above presents four benefits.

[1] Villagers and the Department of Forestry worked together to devise improved forest management systems and advance forest conservation in the face of many constraints.

[2] The win-win effect of improving people's lives

15 In Jamuniya, 65% of households are involved in the sale of firewood. Since the FPC was set up in Jamuniya, illegal logging has declined and the pace of forest destruction has slackened.

and reducing poverty has been observed .

[3] Social trust, as seen above, has also been enhanced.

[4] Put in a broader perspective the JFM has contributed to the fight against global warming to a certain extent, compared to cases where such actions were not taken..

For the JFM to sustain its effects, the following points among others need to be addressed:

[1] To increase the transparency and information sharing by disclosing memorandums of understanding between the Department of Forestry and the two committees..

[2] To further raise the confidence of villagers by enhancing the accountability of the Department of Forestry and the two committees through holding regular meetings.

[3] To give a greater consideration to gender equality.

The fundamental problem in these examples is the growing demand for firewood and building timber in Jabalpur and Bagaraji. Therefore, broader policy measures such as switching to gas for fuel and alleviating population concentration are also required. The question of how to link the improvement in these policies from macro-level to micro-scale measures for natural resource management and conflict prevention, as seen in these examples, merits further examination, but it is beyond the scope of this paper.

(5) Summary

Cases in Indonesia and India reviewed above suggest that there is a scope for confidence building despite multiple constraints, which opens the possibility for pursuing simultaneously environment conservation, conflict prevention and poverty reduction. For this to happen, however, there are a number of conditions that must be met.

First, in view of coherently considering natural resource management and conflict prevention within a country, it is crucial to have an objective knowledge regarding the complex circumstances and backgrounds surrounding the stakeholders. This requires detailed and impartial studies with the participation of all stakeholders, including the local people. Second, the findings of the study must be shared with the local community, the regional government and the central government. This information sharing should be achieved through tools such as workshops and seminars. Third, incentives must be given to guide the stakeholders towards a common vision and encourage collaborative action among them. The stakeholders must be convinced that this is truly a positive-sum game and not a zero-sum or negative-sum game.

Conclusions and Tasks for the Future

Table 5 compares the above examples with reference to the following perspectives:

- What kind of positive-sum game is available?
- Under what conditions can it be achieved?
- What is needed to fulfill those conditions?
- What would happen if the stakeholders (or countries) do not collaborate to achieve a positive-sum game?

This cross-sectional comparison of the examples reveals the following points, together with implications and ideas for donors to consider in future.

1. The nature of a positive-sum game in natural resource management:
   In cases where it is evident that all stakeholders will gain, there is nothing to consider. But often some of those involved will suffer some kind of disadvantage, at least in the short term. (Less freedom in devising water use plans, reduced water rights, etc.). In such cases, those involved must be well informed of the long-term benefits of collaborative natural resource management, or of the undesirable effects which will arise in the absence of such collaboration (conflict, less sustainability of natural resource etc.).
2. For this matter, all stakeholders must share objective information with respect to the specific natural resources involved, such as water, and consult together.
3. In the case of Jordan and Israel, the latter sacrificed some of its water rights in the short term, but it gained the larger prize of peace. Collaboration in the low politics field of joint water resource management provided effective feedback into the

high politics of peace negotiations, leading to the peace treaty. This approach, in a different form, also achieved a success in the Indonesian cases. Discussions based on the objective findings of studies concerning each side's position, context and customs led to solutions that allowed all stakeholders the long-term benefits of forestry management, in the forms of conflict avoidance and business sustainability, even if some stakeholders had to sacrifice their short-term interests to some extent.

4. The keys to achieving such collaboration are as follows:
   [1] Increased net benefits for stakeholders in the long term, to be achieved through cooperation.
   [2] Information on the counterpart's intent to cooperate.
   [3] The political determination to weather short-term disadvantages.
   [4] Support for such determination from the public and interested parties.

   If the stakeholders get correct information and recognize that the situation can become a positive-sum game, it will be easier to achieve collaborative behavior between the parties and build confidence among them.
5. The question of how to propagate the information and awareness of the potential for establishing a positive-sum game is crucial. The donors and research institutes of developed countries and international agencies, together with NGOs, have an important role in this field, with actions such as:
   [1] Proposing right actions that could be subject to cooperation (such as dam construction on the Jordan River).
   [2] Estimating the benefits that would be yielded to both sides.
   [3] Explaining the opportunity costs of failure (or of non-action).
   [4] Conveying the counterpart's intention to cooperate (or, in the case of natural resource management, providing forums for joint debate and negotiation among the stakeholders).
   [5] Cooperating in providing various related information towards conclusion of the negotiations.
   [6] Preparing the financial and technical assistance that will be needed at the implementation stage, showing its availability at an early stage and using it to encourage the parties to talk.
   [7] Mediating in problems that arise at the implementation stage.
6. Education and training activities are crucial to diffuse conflicts and help extend to the countries involved and to all segments of their populations the concept that the collaborative natural resource management can bring a positive-sum game, overcoming short-term disadvantages and, yielding long-term benefits of preventing conflict and achieving environmentally sustainable development. This kind of peace and environmental education should be supported by ODA and NGOs in collaboration.
7. Examples of natural resource management within countries revealed that information must be collected on the stakeholders, their situations, constraints, customs, traditional values and ways of life, and that information must be used as the basis of patient dialogue. Local NGOs and research institutes must cooperate in this grass-roots fact finding. Horizontal studies for cross-sectional comparison and study of cases in various countries should also be reinforced.
8. Finally, needless to say collaborative natural resource management is only one means of conflict prevention. It should be emphasized that action is required in a wide range of fields beyond natural resource management if actual conflicts between and within countries are to be prevented. The more channels for dialogue and collaboration are open, the better scope for flexible responses and concessions will be found. Whether in natural resource management or any other field, the key point is for the stakeholders and countries involved to look forward to a positive-sum game, so that they can pursue dialogue and collaboration backed by political commitment to peace and conflict prevention. That is when the vicious circle of hatred and retaliation is broken and a virtuous circle can begin.

Table 5 Natural Resource Management and Conflict Prevention (Conditions for achieving a positive-sum game)

Main stakeholders	Long-term benefits (positive-sum-gameness)	Constraints on the realization of a positive-sum game (disadvantages for some of the stakeholders)	Conditions for a positive-sum game and measures for achieving them	Notes (Situations that could arise from non-collaboration among the countries and groups involved, etc.).
<Example 1 International River Management in Europe>				
Riparian	[1] Integrated water use reinforces interdependence and confidence among the riparian countries. [2] Conflict prevention due to the above.	[1] Less freedom in planning countries' own water use plans. [2] Reduced water availability compared to the level owned by each country in isolation.	[1] Political commitment to work towards collaboration. (← support from all parts of the population ← importance of education and raising public awareness). [2] Benefits to be gained by collaboration must outweigh the costs (← objective analysis of information on water use and sharing between countries (transparency)). [3] Steady implementation of water use plans (← coordination between countries, preparation of guidelines etc. and joint monitoring). [4] Existence of secretariat with the human and financial capabilities necessary to carry out the above work (Intergovernmental, and within each country's government). [5] Infrastructure for the transport and communications etc. necessary to carry out the above work.	Each country determining its own water use without collaboration may lead to disputes between countries over water, which erode confidence and could, by extension, cause conflicts.
<Example 2 The Israel-Jordan Peace Treaty and Water Resource >				
Israel and Jordan	[1] Joint development and use of water resources reinforces interdependence and confidence between the two countries. [2] Peaceful coexistence through the peace treaty enabled by the above. [3] Resulting conflict prevention and economic development.	[1] Reduced water rights on the Israeli side (covered by better water demand management).	[1] Broader benefits (peace, economic development etc.) that outweigh the disadvantages in the area of water right ([1], left) for Israel. [2] Joint development of additional water resources, a large advantage for Jordan. (← Support from donors). [3] Timely talks at the low and high politics levels (← Discussions in the low politics field on the benefits to be gained by collaboration, such as additional water resources, proceeded in parallel with high politics talks. Thus, the negotiators on the high politics were aware of the benefits to both countries that would follow peace. ← Mutual understanding and information sharing between the low and high politics tracks, both between the countries and within each country). [4] Nurturing awareness of the "common benefits and vision" in the water usage field by implementation of measures such as training in integrated water resource management attended by representatives of the two countries, and joint studies on water supply and demand and desalination. (← Support from donors).	The continuing terrorism and retaliation between Israel and the Palestinians, who have not succeeded in collaborative natural resource management, clearly demonstrate the negative-sum game that results from failure to collaborate.

<Example 3 Environmental Management in Nusa Tenggara, Indonesia>				
Central and local governments, local people, NGOs.	[1] Deepened common perceptions and mutual understanding between stakeholders concerning natural resource management (including protection for biodiversity) and development, leading to confidence building and subsequent community development. [2] Resulting conflict prevention. [3] Sustainable use of resources.	[1] Constraints on local people's land ownership and usage rights in conservation reserves and protected forests.	[1] Gain common understanding among the stakeholders on nature conservation and land use. (← NGOs, research institutes and government officials should work together to conduct social and economic studies, with local people's participation, on biodiversity, protected forest boundaries, land use maps and other data, in order to provide the stakeholders with objective information. Workshops and seminars should then be used for dialogue, education and extension activities with local people. ← This kind of research, investigation, consensus forming, education and extension should be supported by central and regional governments, research institutes, NGOs and donors). [2] The above objective information should be used as the basis for sustainable community developments, such as irrigation cooperatives. (← Supported by central and local governments, research institutes, NGOs and donors).	[1] Local people subjected to forcible removal from the forests where they have lived, in the name of nature conservation, can become destabilizing factors in society. [2] If the living patterns of local people do not change, there is the danger that population increase will lead to the extinction of rare species and destruction of forests. That could, in turn, become an indirect destabilizing factor in society.
<Example 4 Forest Management in Kalimantan, Indonesia>				
Commercial logging concessionaires, traditional slash-and-burn farmers who believe they have inherited the land from their ancestors, central and local governments.	[1] Sustainable commercial logging of the forests by concessionaires while recognizing the forest use rights of the farmers. [2] Resulting conflict prevention and sustainable forest management.	[1] Concessionaires have to reduce logging from the volume they initially planned. [2] Farmers must accept some constraints on their forest use rights.	[1] Collection and sharing of objective information, such as mapping of local people's traditional land use. Recognition by the government and concessionaires of custom-based forest use rights. (← Participation of local NGOs, farmers, and staff of relevant government offices in mapping. Copies of the maps produced should be kept by the Ministry of Forestry, Ministry of Agriculture, Ministry of Livestock, Ministry of Fisheries, regional government agencies, concessionaires and local NGOs). [2] The planned solution arrived at by the compromise between concessionaires and farmers should be agreed to by all interested parties. (← A. Concessionaires limit tree felling to some western slopes respecting farmers' traditional ownership rights in the commercial logging zone. Also, construction of roads in the concession area to improve farmers' market access. B. Farmers work on the conservation of eastern forests and address the problem of illegal logging).	[1] Government and concessionaires do not recognize local people's long-held traditional values and ignore their opposition, potentially causing social destabilization. [2] Commercial logging of the forests by concessionaires menace the basis of farmers' survival, pushing the interests of farmers and loggers into intensifying antagonism.

<Example 5 Joint Forest Management in Madhya Pradesh State, India>				
Central and local governments (particularly State Department of Forestry), local people (farming tribes, logging tribes etc.), NGOs.	[1] Sustainable forest management decided and implemented with the participation of local people and various stakeholders. [2] Resulting conflict prevention and poverty reduction.	[1] Short-term income reduction for local people who fell trees for a business.	[1] Consensus building among stakeholders regarding forestry conservation and the management of non-timber forestry products. (← Establishment of Forestry Protection Committees with the participation of Departments of Forestry and local people). [2] Implementation of the matters agreed upon. (← Local people participate in decision-making in the above committees. Support from central and local governments). [3] Visible benefits for local people (← Forestry Protection Committee membership fees used to support village activities and provide micro-finance).	[1] Population increase raises demand for firewood and timber. → Deforestation by illegal logging. → Soil depletion and groundwater reduction → Intensified antagonism between farming tribes and logging tribes, at the same time the logging tribes themselves lose the basis of their livelihoods. Such a negative-sum game will go on. [2] (In a broader context, policies to avoid population concentration and convert cities to other fuels are required).

Source: Prepared by the author from Correia F.N. & da Silva J.F. (1997), Fisher L., Moeliono I., and Wodicka S. (1999), Kant S. and Cooke, R. (1999), Libiszewski, S. (1997), and Yus.Th., (2001)

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