'Transforming Environmental and Natural Resource Use Conflicts'

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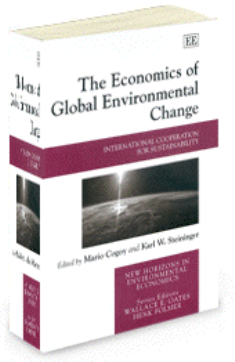


Summary of chapter:

Conflicts over the use of natural resources and the environment can be violent. Such conflicts can either be related to the direct use of resources, e.g. land and water resources for local food production, or the indirect use of resources, e.g. oil, drugs and diamonds, sold far way, yet financing armed conflicts in the regions in which they are extracted or produced. The first kind of conflict is often related to structural violence and lack of development, while the latter can be related to civil war. How can such conflicts be managed? Three schools of dealing with conflicts are examined: the 'Harvard', 'Human Needs' and the 'Conflict Transformation' approach. These schools are compared to the economic approach of dealing with conflict. Lessons from the various approaches are drawn with a special focus on their suitability to environmental and natural resource use conflicts. Based on this, some 32 environmental conflicts as well as one in-depth case (the Nile water conflict), are analyzed. Key conclusions are that greater transparency of resource production and trade are needed to prevent and transform "indirect use conflicts". To deal with "direct use conflicts", greater participation of the involved stakeholders is required. The cases indicate that negotiations assisted by an acceptable third party tend to increase the likelihood of reaching an agreement. One key measure addressing both types of conflicts is the need for more sustainable consumption patterns in the affluent countries, thereby decreasing the demand for resources that can lead to conflict. A decrease in resource conflicts would help people directly suffering from them as well as mitigate some of the global negative impacts of such conflicts.

8. Transforming Environmental and Natural Resource Use Conflicts

Simon A. Mason and Adrian Muller*

1. INTRODUCTION

'No peace will be secure unless it is grounded in equitable sharing of scarce resources or offers a sustainable future for all concerned.' In this statement, Malcom Rifkind, former British Foreign Minister, points to the links between the environment, natural resources, conflict and conflict transformation: the topic of this chapter. These links are referred to with terms such as 'environmental conflicts' (Libiszewski, 1992; Trolldalen, 1992; Gleditsch, 2001), 'environmental conflict resolution' (Trolldalen, 1992; Wolf, 1997), 'violent environments' (Watts and Peluso, 2001), 'natural resource conflicts' (Ross, 2004b), 'natural resource use conflicts' (Hagmann, 2005) or in a broader sense 'environmental security' (Barnett, 2001).

Besides academic interests, there are three reasons for people in affluent societies to study and deal with these kinds of conflicts: first, we are negatively affected by them; second, we are in part co-responsible for them through our consumption patterns; and third, humanitarian 'solidarity' motives may also play a role. We argue that economic approaches are also needed to transform natural resource conflicts peacefully, yet they have their limitations. Thus a survey of approaches in addition to the economic one is presented in section 4.

Besides asking when and how the use of natural resources and environmental systems is linked to violent conflict (the first half of this chapter), it is also important to ask how these conflicts can be managed or constructively 'transformed', how groups can use natural resources in a cooperative way (the second half of this chapter). The destructive effect of violent conflicts and war on the environment is not examined here (see ICRC, 1998).

Environmental conflicts can be caused by the indirect or direct use of natural resources. 'Indirect use' conflicts arise in connection with the production and trade of natural resources for the global market, for example, timber, fish, mineral oil or diamonds. In particular, oil and other lucrative natural resources are sometimes related to the onset, intensity or duration of

armed conflict and civil war. 'Direct use' conflicts on the other hand arise in relation to the actors directly using the resource, for example for agriculture. These kinds of violent conflicts over water and land are generally found in countries with subsistence agriculture, weak economies and political instability. While some small-scale violence may arise, for example between pastoralists and agro-industrialists over access to water (Arsano and Baechler, 2002), these types of 'direct use' conflicts are more generally related to 'structural violence' (Galtung and Hoivik, 1971), lack of development, poverty and migration.

Other criteria for a categorization of environmental conflicts have been used. For example conflicts over 'renewable' or 'non-renewable' resources (Baechler et al., 1996; Homer-Dixon and Blitt, 1998). This criterion, however, is problematic as it is often not clear what is renewable and what is not. Water is renewable when it is rainwater, but when one is using fossil groundwater (rainwater that accumulated thousands of years ago), it is considered non-renewable. Soil erosion is reversible, but only after a very long time. Should soil be considered as renewable or non-renewable? Furthermore, cultivation of the raw material for drugs such as opium or cocaine is considered to be a renewable resource, but in relation to conflict such drugs seem to have more similar characteristics to non-renewable resources such as diamonds than to other 'renewable' resources such as water, for example in a shared river basin.

Another distinction found in the literature on environmental and natural resource conflicts is between resource scarcity (Homer-Dixon and Blitt, 1998) on the one hand, and resource abundance or wealth (Collier et al., 2003; Ross, 2004a) on the other. As long as the scale of analysis is clearly stated, there is no problem. However it is important to clarify that the scale of analysis decides if a resource is abundant or scarce. Diamonds or oil, given as examples of 'abundant resources' or 'resource wealth', are abundant in the region they are located in, but on a global scale they are scarce, otherwise no one would 'fight' over them. Water is scarce in an arid region, but on a global scale there are enough water resources to feed a world population of 11 to 21 billion (Zehnder, 2002).

Thus we use the distinction between 'indirect use' conflicts, where the conflicting parties do not directly use the resource but it is exploited for global commercial purposes, and 'direct use' conflicts, where the conflict parties are directly using the resource. Both types of conflicts may have a global impact, as they can foster destabilization in the region with effects far away from the actual conflict. Collier et al. (2003) list the drugs trade, the spread of diseases (AIDS), organized crime, human trafficking and smuggling, and terrorism as some of the global negative impacts related to destabilization, which in part may be caused by resource conflicts. When it

comes to management strategies, these types of conflict also show commonalities: efficient resource use, sustainable consumption and the application of conflict transformation approaches seem to help mitigate conflicts in both cases.

To capture both types of conflict and to allow a focus on managing conflicts at all stages of escalation, we use a broad definition of an environmental or natural resource use conflict. We define an environmental or natural resource use conflict as an incompatible interaction between at least two actors over the use of natural resources or an environmental system, where one of the actors is damaged by the interaction, and the other actor intends or ignores this damage. We use the term 'conflict transformation' instead of 'conflict resolution' or 'conflict management'. This is to indicate that the aim is to transform how actors deal with the conflict, moving from hostile to cooperative means, rather than to resolve the issue permanently (which is often unrealistic) or 'manage' it in a top-down manner rather than in a participatory form.

The environmental conflict literature, especially concerning the link between scarce renewable resources and conflict, has been criticized, from positivist (Gleditsch, 2001) as well as more post-positivist and political ecology angles (Hagmann, 2005; Dalby, 2004; Barnett, 2000; Watts and Peluso, 2001; Forsyth, 2003). At times the beneficial points of these criticisms have been lost in a lack of constructive dialogue between the authors (see, for example, the dialogue between Homer-Dixon, Peluso and Watts, 2003).

The methodological criticism of Gleditsch (2001) points out that the case studies of the Toronto (for example Homer-Dixon, 1999) and Environment and Conflicts Project (ENCOP) groups (Baechler et al., 1996; Baechler and Spillmann, 1996a) were chosen without the independent variable 'environmental scarcity', or the dependent variable 'conflict', having any alternative (environmental abundance, cooperation). Thus, some sort of link between scarcity and conflict was guaranteed from the start, as all cases included referred to situations where both scarce resources and conflicts were present. This criticism is valid if one seeks correlations or even causal effects (does A lead to B?) based on statistical analysis. Schwartz et al. (2001), however, point out that many real-life problems cannot be addressed with statistical methods striving to reveal patterns in the aggregate. If one seeks to trace and understand causal mechanisms (how does A lead to B?), in-depth case-studies are needed. Schwarz et al. argue that 'process-tracing', that is, a detailed step-by-step analysis, is an effective way of understanding a causal mechanism – how scarcity or resource wealth can lead to violent conflict. More recent research has taken up some of these methodological and conceptual criticisms (for example, see Ross, 2004a, or Humphreys,

2005, on causal mechanisms in relation to resource wealth), thus attempting greater flexibility of the dependent variable, and also examining cases where environmental scarcity has led to cooperation, for example the research projects ECOMAN (Environment and Conflict Management) (Baechler et al., 2002) and ECONILE (Environment and Cooperation in the Nile Basin) (Mason, 2004) or the list of cases below (Tables 8A.1 and 8A.2 in the Appendix).

The other theoretical type of criticism, more post-positivist, is related to the 'neo-Malthusian' assumption that the 'environment' determines human behaviour, and that conflicts over scarce resources are unavoidable (Hagmann, 2005; Barnett, 2000; Dalby, 2004). Forsyth (2003) points to the danger of 'environmental orthodoxies', meaning explanations of environmental problems that are accepted 'general knowledge', even if they are wrong or at least debated. Watts and Peluso (2001) argue for not starting one's analysis based on the degree of scarcity or abundance of a resource, but rather on the political economy and questions of access, control and struggle over environmental resources. Hagmann (2005) argues that research should move on from always focusing on conflict causes, to greater focus on resource and conflict management strategies.

To take up these points, at least in part, we especially focus here on how to manage and 'transform' conflicts over natural resources. To do this we also use concepts from the social constructivist approach to conflict, such as the conflict transformation approach (Bitter, 2003; Lederach, 1995, 2005). We discuss these in relation to more mainstream neoliberal approaches that generally argue for establishing markets to solve allocation problems (see section 4). We include both a positivist focus on 'objective' aspects (for example data on resource availability) and a more psychological and postmodern focus on 'subjective' aspects (for example, perceptions, values, communication dynamics), because the literature seems to be dominated by focusing on either the one or the other aspect, and insufficiently trying to combine them.

The chapter is structured as follows: section 2 summarizes the causes and characteristics of 'indirect use' conflicts. Section 3 then presents the 'direct use' conflicts. The fourth section moves from the question of what causes environmental conflicts and how they are characterized to the second question of how to deal with them constructively. It does this by outlining some general approaches to the transformation of conflicts. Various approaches to dealing with conflicts are used to broaden economic approaches, which tend to be limited when dealing with the 'soft' psychological aspects of communication and interpersonal dynamics. In section 5, some aspects of conflict transformation are adapted in relation to the environment and natural resource use question. In section 6, these

approaches are illustrated with 32 cases in table format. Section 7 illustrates these approaches in a case-study from the Nile Basin. Section 8 concludes with some more general policy recommendations.

2. CONFLICTS OVER THE INDIRECT USE OF NATURAL RESOURCES

Conflicts over the indirect use of natural resources are related to the commercial use of natural resources. The actors involved in mining, production and trade are not the end-users of the resources; they are 'indirect' users (we in the so-called developed countries may be the end-users, however, when we drive a car, heat our homes, wear our diamonds, use our mobile phones or eat fish, or in the unlikely event of becoming addicted to heroin). One can differentiate between intra-national and international conflicts.

2.1 Intra-National 'Indirect Use' Conflicts

Of the 25 armed conflicts with more than 1000 dead in the year 2000, all but two of them were intra-national (SIPRI, 2001). What role do natural resources play in such conflicts? According to Collier et al. (2003), there are four main risk factors that increase the probability of civil war: (1) a large dependency on the export of primary commodities (that is, natural resources); (2) an economy in decline; (3) a low per capita income; and (4) an unequally distributed income. Ross (2004b) shows how oil resources go hand in hand with a higher probability of civil war. 'Lootable' resources such as diamonds and drugs may prolong existing civil wars, rather than being a key factor in initiating them. According to Ross, legal agricultural products for global trade, such as coffee, sugar or cacao, are not related to a greater risk of civil war. Examples of primary commodities that are related to civil wars – either to their onset or their prolongation – are oil (Sudan, Nigeria), diamonds (D.R. Congo), timber (Cambodia), copper (Papua New Guinea) and coltan (D.R. Congo) (Ross, 2002).

Five possible reasons why natural resources play a role in civil wars are outlined here. First, the military costs of the government or opposition can be funded by lucrative natural resources. If the resources have a high value per weight unit, for example diamonds and drugs, it is easy to transport, smuggle and trade them, and they can thus easily be transformed into financial assets to fund a war (Collier et al., 2003). In contrast to this looting hypothesis, Ross (2004a) indicates that there is no clear evidence that the looting of resources by rebels or extorting money from resource firms is related to the onset of civil wars, even if it may prolong them once started. Second, the power of a government is not dependent on taxes and therefore

the will of the people, but it can use the revenues from the natural resources ('rentier state'). Thus there is no check and balance, and the interests of society are neglected (for example oil in Sudan or in the Middle East) (Münkler, 2003). Third, if a resource, such as oil, is located in one region of a country, this may give rise to separatist conflicts, with the government or opposition seeking to keep control over the resource-rich region (for example Angola) (Collier et al., 2003). A government may also repress rebel movements that may interfere with resource exploitation in such an area (Ross, 2004a). Fourth, resource wealth may lead to intervention by a foreign state that supports the rebel group in the country with resource wealth (for example Sierra Leone and the second D.R. Congo war) (Ross, 2004a). And fifth, the sale of future exploitation rights to resources may also contribute to the onset of a civil war (for example in Sierra Leone and the second D.R. Congo war) (Ross, 2004a).

Oil is one example of a resource that can lead to violent conflict, a separatist war (control of an oil-rich territory, repression of a rebel movement in this territory) or civil war in general. Oil wealth may be mismanaged, either intentionally in the form of corruption, or more in line with the reasoning behind the 'Dutch disease', where other sectors and thus the general economic development of a country are neglected. If a civil war is already under way, acts of sabotage on pipelines or taking oil personnel as hostages are ways of funding opposition forces, thus prolonging a conflict (Collier et al., 2003; Le Billion and El Khatib, 2004; Wheeler et al., 2001).

Another example is coltan – columbite-tantalite – a mineral that is found in D.R. Congo (besides Australia, Canada and Brazil) and used in condensers in electronic equipment (for example mobile phones). Coltan was seen as one of the key factors that led to instability and prolonged the civil war in D.R. Congo. International investments in rebel groups mining and controlling these resources seemed to have played a key role (Montague, 2002).

It is estimated that 95 per cent of global opium production (heroin) is based in countries with a civil war or in regions that are not fully controlled by an internationally recognized government. Storage and trade are also often organized from such regions. Examples are Columbia for cocaine, and Afghanistan and Burma/Myanmar for opium (Collier et al., 2003).

Finally, it is important to point out that there is no direct link between resources and conflict. Countries with functioning institutions such as Botswana may use the revenues from the available natural resources for the country's development. Countries like Sierra Leone, on the other hand, with a weak political system, may decline into chaos despite or because of their resource wealth (Collier et al., 2003). An inability to harvest the benefits from resource wealth, be it because of the 'Dutch disease', rent-seeking or

bad institutional and political choices, is a recognizable pattern in what is often referred to as the 'resource curse'.

2.2 International 'Indirect Use' Conflicts

International wars are rare since the end of the Cold War, although the distinction between international and intra-national (or civil) war is often difficult in practice, as civil wars tend to spill over into the surrounding regions. International wars in relation to the indirect use of natural resources are therefore also rare in a post-Cold War era, oil being the main resource in this context. At a much less escalated level, international fish conflicts have occurred, as summarized in Table 8A.2 in the Appendix.

Oil has often been mentioned in relation to the two Iraq Wars. Officially it has been negated as a reason, for example by Donald Rumsfeld (CBS News, 14 November 2002) or Tony Blair (*The Times*, 15 January 2003). One of the main interests of the USA in the stability of the Middle East is to be viewed in terms of security considerations. US interest in the stability of the region is, however, also to be seen in relation to the Middle East's rich oil reserves (Palast, 2005). According to the Energy Information Agency, the net oil import of the USA in the year 2004 was 58 per cent of demand (EIA, 2006). The Energy Information Administration (EIA) estimates that the dependency of the USA on oil imports in the year 2030 will lie at 62 per cent of demand (it has to be noted that these projections are subject to considerable variation, for example due to the oil price development; EIA (2006) projects 60 per cent of demand to be covered by oil imports for 2025 while this has been projected to be 68 per cent in the report from 2005). Much more important is the general stability of the global economic system, which relies heavily on oil as a source of energy.

Concentration on the oil and gas resources in the Middle East and Russia is likely to increase in the coming years, as the largest reserves are found there (with about 71 per cent of the global conventional oil reserves and 69 per cent of global gas reserves; BGR, 2003). The oil reserves in the USA and Europe will decline first. There are different estimates as to when global oil production will peak, after which the demand is likely to surpass the supply, and prices may rise. However, many more factors influence prices, and the recent price increases point to the complex interplay between expectations, supply security and resource availability. Pessimists estimate the peak to be reached by 2010, optimists suggest that it is not likely that peak oil will be reached before 2030, and a mid-field of experts view the peak as likely somewhere between 2015 and 2020 (BFE, 2003).

Fish-related conflicts do not fit well into the categorization of direct and indirect use conflicts, as local 'direct' fishermen are often in conflict with commercial 'indirect' fishermen, who sell fish on the global market. Some

fish conflicts are also connected with the protection of fishing sites and pollution. This is a form of environmental conflict that is considered in the following section. Fishery conflicts must be viewed in the general global trend of overfishing. The Food and Agriculture Organization of the United Nations (FAO) estimates that already 44 per cent of the large fish populations are strongly or totally depleted (Gross, 2001). The key problem regarding international fish conflicts is found in the international waters outside the Exclusive Economic Zones (EEZs). In the EEZs coastal states have sovereign rights in a 200-nautical mile zone from their coasts with respect to natural resources and certain economic activities, and exercise jurisdiction over marine science research and environmental protection. Examples of fishery conflicts are the 'Cod War' between Great Britain and Iceland, or the 'Turbot War' between Canada and Spain (see Table 8A.2 in the Appendix for more examples). Fishery conflicts may involve direct violence (in contrast to structural violence; Galtung and Hoivik, 1971), for example when shots are fired, but they are of a very much lower escalation level than the oil conflicts mentioned above.

3. CONFLICTS OVER THE DIRECT USE OF NATURAL RESOURCES

Conflicts over the direct use of natural resources can again be differentiated between intra-national conflicts and international conflicts. As opposed to 'indirect use' conflicts, most 'direct use' conflicts are of a lower escalation level, and more related to structural violence. Nevertheless, the detrimental impact of such conflicts should not be underestimated. The International Federation of Red Cross and Red Crescent Societies (IFRC, 2003) estimates that there are at present millions of 'environmental' refugees, in part related to the issues discussed below. Developments in the global management of climate change (see Finus, Chapter 6, and Eyckmans, Chapter 7, this volume) will be crucial in relation to an increase or decrease of environmental conflicts and migration.

3.1 Intra-National 'Direct Use' Conflicts

Intra-national environmental conflicts can be differentiated into three groups: (1) conflicts between users of the same economic sector (agriculture, industry, municipal); (2) conflicts between users of different economic sectors, for example when water resources are transferred from the agricultural sector to industry; and (3) conflicts over large projects, where residents may be displaced, and beneficiaries often live far from the project site, for example large dams.

Conflicts over land and water within one economic sector often involve

violence when they are found in countries where subsistence agriculture dominates, and poverty is prevalent (Baechler et al., 1996). Famines can also be viewed as a form of structural violence, resulting from failed policies. Between 1997 and 1999 some 777 million people suffered worldwide from malnutrition (FAO, 2002). Especially in relation to land, clarity about property rights (often a combination of state, private and communal rights) is crucial in order to enable development and mitigate conflicts (see also Fraser and Hubacek, Chapter 3, this volume). Drinking water conflicts may occur when public drinking water facilities are privatized (Perry et al., 1997). Combined with other factors, this may lead to riots, such as in the case of Cochabamba, Bolivia (Mason and Muller, 2004). Conflicts in the industry sector are often found in relation to large-scale projects (see below), as well as in relation to pollution and land use.

Worldwide, about 70 per cent of all freshwater withdrawn from natural systems is used for irrigation purposes (UN, 1997b). Because agriculture has a low economic return per invested water unit in comparison to other uses, there are many regions where water is being transferred from the agricultural sector to other sectors, for example industry, tourism or for drinking water. This reallocation can cause conflicts between farmers and non-farmers. The issue of water as a private economic good on the one hand, and water as a public economic good on the other hand, is important here (Perry et al., 1997).

Conflicts over large projects are often between the resident population that is harmed by the project, and the state as a representative of the general population that hopes to benefit from it. Examples are large dams, river diversions, drainage of swamps, construction of nuclear power plants or industrial complexes. The World Commission on Dams estimates that during the past 50 years 40–80 million people were relocated due to the construction of dams (WCD, 2000).

Generally intra-national environmental conflicts are due to the marginalization of a part of the population, or in economic terms, the failure to internalize external costs of the respective activity. This indicates how to transform such conflicts: the people directly affected need to be involved in the decision-making processes, and external costs need to be internalized.

3.2 International 'Direct Use' Conflicts

Three types of international 'direct use' conflicts can be differentiated: (1) international freshwater conflicts; (2) conflicts in the context of global environmental protection issues (for example climate change, ozone depletion); and (3) other conflicts related to the use of environmental resources and systems (for example over genetic patenting, biodiversity).

Worldwide, economically available, renewable freshwater resources are

estimated at 9000–15 000 km^3/year (Zehnder, 2002). On a purely vegetarian diet, about 21 billion people could be fed with these water resources. On a diet in which 20 per cent of the calories are provided by meat, 11 billion people can be fed (Zehnder, 1997, 2002). This shows the great impact of consumption patterns on the question of resource scarcity, and that on a global level there are actually enough water resources. On a regional level, however, some 450 million people live in countries that suffer under water scarcity (less than 1700 m^3 per year per person), and by the year 2025 this will increase to 3 billion people (Spillmann, 2000). Water-scarce countries are found in North Africa, the Middle East, and Central and South Asia.

Water scarcity, combined with shared water resources such as an international river, may lead to conflict between upstream and downstream users. About 45 per cent of the global land surface is covered by an international river basin, and there are about 260 international rivers (UN, 1997b). Examples of international rivers that have experienced conflict as well as cooperation efforts are the Nile, Jordan, Euphrates/Tigris, Indus and Mekong. Generally water quantity problems (water withdrawal for agriculture, for example the Nile) are more likely to lead to tensions than pollution and water quality problems, where technological fixes can 'clean' the water (such as in the Rhine).

The reason why international river conflicts do not lead to war can be seen in the option of a water-scarce country importing food (Allan, 1997). 'Virtual water' describes the fact that a lot of water is embedded in food that can be far more easily transported around the world than water. A kilogram of bread, for example, requires about 1000 litres of water to produce, whereas 1 kg of beef requires 15 000 litres of water to produce (Yang and Zehnder, 2002). It is expected that the global food market in the year 2025 will have an equal economic value to the present oil market (US$450 billion/year), and that about 25 per cent of this will be driven by water scarcity and the need for water-scarce countries to import food (Zehnder, 2002). Allan (2003) therefore argues that the Integrated Water Management Approach (see Kluge, Chapter 5, this volume) only makes sense if it also takes virtual water into consideration. Egypt, for example, imports about 40 per cent of its cereals, which is equivalent to about 15 km^3/year, or 30 per cent of the water it is presently using (Mason, 2004). A basin-wide approach to water management without considering the physical (water and food) and non-physical (political processes, economic flows) linkages between the sub-national, regional and global water system falls short of reality, and may lead to faulty conflict mitigation measures (Mason et al., 2005).

Although international river conflicts and water scarcity do not lead to war, they may however lead to political instability, lack of development and sub-national violence (Wolf, 1998). They can therefore have generally

destabilizing effects on a region or country. While there exist many bilateral agreements on sharing international rivers to mitigate conflicts, there is no globally accepted norm on how to share these resources. The UN Convention on the Law of Non-Navigational uses of International Watercourses is not accepted by many countries. In addition it only outlines general principles such as the obligation of 'equitable use' between all users, and the 'no significant harm' principle (Charzournes, 2003). An overview of international river conflicts is given in Table 8A.1 in the Appendix.

Besides freshwater conflicts, the second type of 'direct use' international environmental conflict concerns global environmental protection questions. Climate change is the most prominent example (see Finus, Chapter 6, this volume). Here a 'low-level' conflict can be discerned between those countries that seek effective measures to reduce climate gas emissions, and those countries that are trying to block these measures. Climate change has impacts in various areas, such as rising sea levels (South Pacific Islands), changes in vegetation zones, or greater climatic fluctuations (drought and floods). In turn, these changes may cause sub-national conflicts. Since the developing countries are in general more vulnerable to the negative impacts of climate change, but the developed countries are still the main cause of greenhouse gas emissions, there is a latent conflict between these two groups.

The third type of 'direct use' international conflict is a collection of other conflicts over the protection of environmental systems or the use of natural resources. Examples are conflicts over air pollution in Europe in the 1960s (Trolldalen, 1992), conflicts over access and rights to patents over genetic resources, conflicts between people for and against protection of biodiversity or other environmental protection measures (Table 8A.3 in the Appendix).

4. APPROACHES TO DEALING WITH CONFLICTS

General approaches to dealing with conflict can be subdivided into coercive (for example police, military peace enforcement, peace-keeping) and non-coercive conflict management, which in its turn can be divided into two broad areas: those dealing with legal and institutional frameworks, and those involving cooperative negotiations and interactive conflict management. The latter approach directly addresses the interests, needs and values of the involved parties, and the dynamics of conflict and cooperation affecting the relationship between them.

The three forms of conflict management, police/military, legal/institutional and interactive, give greatest importance respectively to the aspects of power, law and mutual interest satisfaction, elements that are

present in all conflicts and negotiations (Ury et al., 1988). Military or police intervention is often needed in highly escalated conflicts where mutual destruction may only be avoided by outside intervention. As this high form of escalation is rare for international environmental conflicts, the military form of management will not be discussed here. The more legal/institutional and policy-oriented branch will also be left out, as other chapters in this book deal with it (for example Friedl, Gebetsroither and Getzner, Chapter 4; Fraser and Hubacek, Chapter 3; or Kluge, Chapter 5). The economic regulation approach – which can be viewed as one example of the institutional approach – is presented here in order to discuss how it fits with and differs from the interactive conflict approach; also because it plays a dominant role, as it builds the basis for the development work in the spirit of the 'Washington Consensus' still put forward by institutions such as the World Bank (Rodrik, 2006). The different forms of conflict management are complementary. After a constructive change in communication and the development of a solution that takes the different interests, needs and values of the parties into account, the points agreed on have to be formulated in a legal document and the relationship institutionalized. In other words, negotiations should lead to institutions and legal frameworks, and these need to be enforced. Thus, before presenting the 'interactive' approaches to conflict, some key aspects of an economic approach are introduced to enable comparison at the end of this section. The economic and conflict approaches discussed below are very broad, in the sense that they show a worldview. To make these worldviews more operational, we will carry some key aspects of each approach to the later sections of this chapter, to structure the analysis.

4.1 Economic Approach

To set an admittedly extreme reference point, we present the ideal market case, which nevertheless builds the stylized basis for economic approaches to conflict resolution. The economic approach to preventing or managing conflicts focuses on the individual actor and strives toward the ultimate ideal of a complete market. This is characterized by the absence of external costs, by complete property rights (everything is owned by somebody, and there is a market for everything), complete information (especially complete information on the consequences of all actions undertaken, no asymmetric information, no transaction costs), absence of market power of a single producer or consumer (all participants face the same prices that they cannot influence), or of a group of such, that is, absence of collusion, absence of dynamics (there are no potentially painful adjustments while reaching the equilibrium), and possibility for free entry and exit (any new producer can decide to enter or leave the market at any time). A competitive equilibrium is characterized by maximization of the profit of each producer,

maximization of the utility of each consumer and a market clearing condition.

The First Fundamental Welfare Theorem then states that such a situation is Pareto-optimal, that is, that nobody can be made better off without making at least someone worse off. This is the famous 'invisible hand' of Adam Smith. 'Pareto-optimality' does not address questions of distribution and equity. The Second Fundamental Welfare Theorem states that for any Pareto-optimal choice of utility levels of the consumers, wealth transfers are possible that lead to a competitive equilibrium with these utility levels. A central authority could achieve any Pareto-optimal allocation it is interested in by wealth transfers among consumers. These results hold true for considerable generalization, but some assumptions are essential, in particular the presence of a competitive market. The welfare theorems indicate that there is no conflict in this highly idealized theoretical setting. In a competitive market, producers and consumers are driven to interact in a perfectly compatible way, resulting in the equilibrium situation. Neither market participant has the power to force his position onto others. This goes along with increased efficiency as an overall goal.

The shortcoming of the complete market is its highly stylized nature. If all the necessary assumptions are not met, the results fail to hold and the hitherto optimal outcome is no longer optimal. This is always the case in reality – real markets are incomplete. There are negative externalities, weak property rights, transaction costs and asymmetric information, there is market power, collusion takes place, there are painful adjustment processes, and market barriers can make free entry impossible. These shortcomings are widely admitted, but nevertheless this stylized ideal can serve as a guideline for some aspects, and much of the goal of an economic approach is to reduce any market failure present. This can be by the establishment of stable property rights, for example, which are seen as one historically important factor for success or failure in development (Acemoglu et al., 2001), or the reduction of power and information asymmetries. The purely economic approach (for example the Washington Consensus) has been enriched by a whole catalogue of further institutional necessities, but only recently, based on analysis of success and failure of development strategies in the 1990s, has the insight into the importance of individual, case-specific factors emerged (Rodrik, 2006). As we proceed, the key aspect from the economic approach that we will carry forward for the analysis of environmental conflict transformation is the focus on efficient resource use, that is, avoidance of wasteful practices in resource exploitation and consumption.

4.2 Interactive Approaches to Dealing with Conflict

We now move from the economic approach, as one example of an

institutional approach to managing conflicts, to the 'interactive' conflict approach. 'Multi-track diplomacy', 'alternative dispute resolution', 'unofficial conflict management', 'conflict transformation' and 'interactive problem-solving' are some of the names found in the literature describing different aspects of this field of cooperative, interactive conflict management. The leading question is not who is right or wrong (law), not how to get closer to ideal markets (economic approach) and not who is more powerful (military approach), but whether there are ways of transforming the conflictive relationship and finding consensual 'win–win' solutions that can satisfy the interests and needs of all the parties involved. Some of the main principles of these cooperative conflict management approaches are summed up below. Three main schools can be distinguished in this field (Bitter, 2003): the 'Harvard' approach (Fisher et al., 1991), the 'human needs' approach (Burton, 1990) and the 'conflict transformation' approach (Lederach, 1997, 2005).

The Harvard approach

The 'Harvard' approach from the Programme on Negotiation at Harvard is a form of interest-based conflict management that focuses primarily on specific interests (why people want what they want), rather than on positions (what people say they want). It uses negotiations to find a mutually accepted settlement to the different interests. Alternatively it seeks mutually accepted criteria for assessing solutions. It tends to be content- and output-oriented, and is based on an individualist worldview (Fisher et al., 1991). The smaller the power asymmetry between the parties, the smaller each party's best alternative to a negotiated agreement (BATNA) is (that is, if one does not have good alternatives, one is more likely to negotiate); and the greater the actors' perception is that one can gain from cooperation, the better the chances are that negotiations will lead to success. 'Win–win' solutions are mutually acceptable solutions whereby the interests of both actors A and B are satisfied. In contrast, legal or power-based solutions to a conflict often result in 'win–lose' or 'lose–lose' solutions.

The human needs approach

The 'human needs' approach is a needs-based approach to (permanently) resolve the root causes of a conflict. It argues that some issues cannot be negotiated and no conflict can be dealt with in a sustainable way if the basic needs (for example recognition and identity) of the conflict parties are not satisfied. 'Universal' needs are also seen as a bridge between different conflict parties. This approach analyses a problem and can be output-, process- or relationship-oriented (Burton, 1990; Rosenberg, 1999). The human needs approach calls for a non-adversarial framework, an analytical approach and a problem-solving orientation. In the human needs approach,

it is not just official actors who are called on to analyse and resolve unmet needs. Multi-track conflict management focuses on the synergies between conflict management by officials (track one) and by non-official, informal representatives of society (track two), and efforts at the grass-roots level (track three). The advantages of each track are used in order to develop and implement solutions that are accepted by all levels of society. Non-official experts who meet each other in an informal setting are often more flexible about developing and brainstorming management options, as they do not need to defend fixed official policies.

The conflict transformation approach

The 'conflict transformation' approach is a relationship-focused approach that views conflicts as culturally constructed realities. Conflicts are not just conflicts of interests, but also of values that take place in a specific context. Conflicts can be motors of social change. Understanding the 'language', the terms of reference, the values, is important to empower conflict parties and to support recognition between them. It is a process-oriented approach (Lederach, 1995, 2005; Bush and Folger, 1994; Bitter, 2003, pp. 25–8). A conflict is transformed from a hostile to a cooperative mode through a change of perception and relationship between the involved parties. If a third-party facilitator gets involved to support conflict transformation, they must take the cultural reality into consideration. The subjective perception (Spillmann and Spillmann, 1997) and cultural context (Bitter, 2003) of the involved parties is also a 'reality' that influences a conflict, not just the 'objective' issues.

Discussion of the interactive approaches

The three schools of dealing with conflict are complementary. While the Harvard approach is useful within the Western culture it was developed in, it has limitations in other settings. The human needs approach has the advantage of giving greater priority to social justice than some of the other approaches that may seek 'peace at all costs'. It has some difficulties in defining universal basic needs (see, for example, Max-Neef, 1991; Rosenberg, 1999), however, and how they are framed in various cultures (Bitter, 2003). We therefore argue that a conflict transformation approach may be the most promising approach for dealing with environmental conflicts in different cultural settings.

We carry four key aspects from these approaches onward to structure our analysis of environmental conflict transformation. First, the focus on interests, needs and values, instead of positions. The different conflict approaches give different weight to interests, needs and values, but they all agree that focusing on positions alone is insufficient. A focus on perceptions and 'subjective' factors is as important here as 'objective' facts. 'Ultimately,

however, conflict lies not in objective reality, but in people's heads. … Fears, even if ill founded, are real fears and need to be dealt with. Hopes, even if unrealistic, may cause war. Facts, even if established, may do nothing to solve the problem' (Fisher et al., 1991). The second aspect we will carry forward is the focus on participatory processes, an inherent aspect of all three interactive approaches to dealing with conflict. Those directly involved in the conflict need to be involved, or at least represented, in dealing with it. There are also generally three phases to such processes: pre-negotiation (talks about the talks), negotiations and post-negotiation (implementation). Stakeholders need to be involved in all phases, and not just in the implementation phase. A gender-sensitive approach and greater inclusion of women on all levels of decision-making tends to make efforts more effective, network-like, less hierarchical and therefore more sustainable. Third, above a certain escalation level, that is, increase in tension between the conflict parties, third-party assistance can mediate or facilitate the participatory process. Mediation is one form of third-party assistance:

> Mediation is generally defined as the intervention in a negotiation or a conflict of an acceptable third party who has limited or no authoritative decision-making power but who assists the involved parties in voluntarily reaching a mutually acceptable settlement of issues in dispute. In addition to addressing substantive issues, mediation may also establish or strengthen relationships of trust and respect between parties or terminate relationships in a manner that minimizes costs and psychological harm. (Moore, 2003, p. 15)

Facilitation has a less explicit mandate from the conflict parties, and is often less forceful in its intervention style. One of the key tasks of a mediation or facilitation is to assist the exchange of perceptions. Only when actors have 'walked in each other's shoes' for a while can they really understand the other actor's perception of a situation. The fourth aspect we will carry onward is a sensitivity to power and power asymmetry between conflict parties. The conflict transformation approach argues that conflict parties need to be empowered in order to express their needs and find ways to satisfy these needs through peaceful means. Experience from mediation and negotiation also show that a certain degree of power symmetry is required for these approaches to work: if one actor is much more powerful, they will dominate the weaker actor.

4.3 Comparison of the Economic and Interactive Approaches

In the following we discuss how the economic approach can be complemented by the above-discussed approaches to dealing with conflict. We then apply some of these concepts to environmental conflicts in the next section. The interactive approach deals with the 'soft factors' that are often

dealt with only unsystematically or even partly neglected in the economic approach, as it lacks a consistent set of concepts to address these issues systematically. A key argument of the first two interactive approaches is to distinguish between positions (what I want), interests (why I want what I want) and basic needs. In a market context, on a formal, theoretical level, however, no distinction is made between positions, interests and needs. The 'what' question is answered by 'I want to maximize my profit, my utility' and the 'why' question is also answered by 'Because I want to maximize my profit, my utility.' In the formal market context, therefore, positions and interests are essentially the same. For a formal economic analysis in this context, the basic needs by definition take the same form as well – 'Because I need to maximize my profit, my utility' (Mason and Muller, 2004).

The role of language and values, key in the conflict transformation approach, also points to the danger of economic 'discourse hegemony'. The introduction of other conflict concepts enriches the language that can be used in such situations. The multiple actors in a conflict no longer need to feel pressed to use only economic concepts, as is the case if only economics provide the 'legitimate' concepts to be used to assess a certain situation – as is frequently the case. This helps to distinguish actions performed in best economic practice and in line with cooperative behaviour from actions that should be considered aggressive but fall under the cover of wise economic strategy. Conflict analysis adds a value, a moral component to the discussion. This might seem unscientific, but it is unavoidable if one wants to deal with the real problems of our societies (Mason and Muller, 2004).

'Power' is crucial in driving outcomes in any incomplete market. In the market context it mainly refers to economic issues and is a means to hold positions or to achieve any goal formulated. This ultimately signifies power to influence the prices – be it directly or by capturing the political authorities to set advantageous rules, or by other channels. In the interactive approaches, however, power is a much broader concept, also involving psychological aspects. It can even develop a certain dynamic of its own and become a goal in itself, not only a means to fulfil positions, interests and needs (Mason and Muller, 2004). This comparison of the economic and interactive approaches is summarized in Table 8.1.

In summary, there are three basic approaches to dealing with conflict: coercive, legal/institutional and interactive/cooperative. The economic approach as an example of an institutional approach may be used when dealing with conflicts, for example to internalize negative externalities or to strengthen and establish property rights (in general to increase efficiency by creating a situation that is closer to an ideal market setting). However, the economic approach has grave limitations. The interactive/cooperation approaches focus more on the 'soft' psychological dimensions of interaction

between actors' groups when dealing with conflicts. These approaches can broaden our understanding of the dynamics at hand, and help us in facilitating such negotiation processes. When they are successful, they should end in some form of mutually accepted institution or legal framework.

Table 8.1 Schematic comparison of the economic approach and the interactive (Harvard, human needs and conflict transformation) approaches

Criteria for comparison	Economic approach	The three interactive approaches
Factors causing the conflict	Economic factors only (market failures): asymmetric information, transaction costs, market power, collusion, dynamics.	Psychological, political, economic, social and cultural factors interacting with each other.
Suggested management	Create a situation that is closer to a market situation (as a whole or regarding specific parameters).	Bring the parties together to interest-based negotiations. If need be, use a third party. Form of intervention should fit level of escalation.
Tools for management	Market-based policy instruments, focus on economic incentives to operate efficiently.	Focus on interests and needs, rectify power symmetry, legalize/codify negotiated outcomes.
Assumption of 'internal' motivation	Individual utility maximization, '*homo oeconomicus*'.	Satisfaction of interests and needs, combined with empathy for the other, '*homo socialis*'.

Source: Mason and Muller (2004).

5. TRANSFORMATION OF ENVIRONMENTAL CONFLICTS

We understand the transformation of environmental conflicts as referring to all kinds of interventions in a conflict over the use of natural resources and the degradation of the environment with the aim of solving the problems as

perceived by the involved actors, transforming the hostile relationship between the actors into a cooperative relationship, and enhancing ecological sustainability.

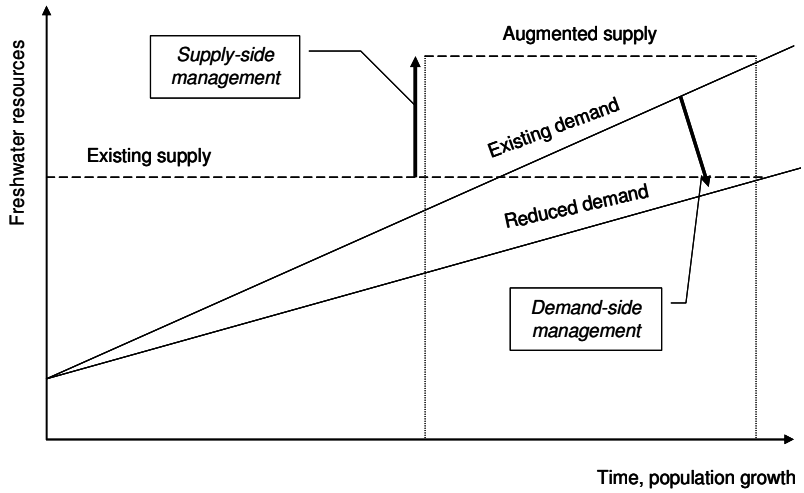
The management or 'transformation' (as the term 'management' is often associated with a top-down controlling nature) of environmental conflicts is often characterized by the application of general conflict approaches to an environmental conflict. There are, however, some important differences. We focus on two key aspects: first, the systemic, linkage approach, and second, the sustainability and relative adaptive capacity aspect.

5.1 The Systemic, Linkage Approach

The linkage approach argues that both physical (for example water, food) and non-physical (political processes, economic flows) linkages between sub-national, national and international levels or 'systems' need to be taken into consideration in a systemic manner (Jervis, 1997; Mason et al., 2005). The stability of world market prices for cereals, for example, has an influence on water development policies of water-scarce countries, as it may affect such countries' policy decisions as to whether to produce or import food. Cooperation on an international level between countries of an international river basin has an influence on local water development projects, for example when dams are built or rivers diverted. If these linkages are not considered, a 'sound' conflict transformation measure at one level may cause unforeseen conflict at another level. This also requires awareness of the 'system' boundaries that one sets, and the relationship of this 'system' to its environment (that is, super-system). Besides the actual environmental conflict, other conflict issues and 'framework' conditions (for example the end of the Cold War) are crucial in how environmental conflicts are carried out. There is no one and only 'best' system boundary; even the Integrated Water Management Approach with its focus on natural river basins (that is, watersheds) is limited if food trade and other linkages are not considered (Allan, 2003; see also Kluge, Chapter 5, this volume). Thus for each question the adequate spatial or 'system' boundary needs to be reflected, and revised if necessary.

5.2 The Sustainability and Relative Adaptive Capacity Approach

The sustainability approach argues that environmental systems need to be managed with a long-term time horizon in mind, and within the limits of their (relative) adaptive capacity. Since natural resources are finite, the sustainability paradigm argues that demand-side management (that is, increase in efficiency through greater return per unit of resource used) is in the long term superior to supply-side management (that is, increase in the primary available resources) (see Figure 8.1).



Source: Arlosoroff (2002).

Figure 8.1 Comparison of demand- and supply-side management

Demand-side management can happen through reuse of the natural resource, or reallocation of the resource from sectors with low return to those of high return, or through a change in consumption patterns, where less of the resource is needed. Supply-side management can happen through dams, stopping water from flowing into the sea, or drying up swamps. Even if this is done most efficiently, there are finite limits on the supply side: rainfall is limited, and desalinization is too expensive for agricultural purposes. Also, in line with strong sustainability (that is, that natural resources cannot be fully substituted by economic assets or human-made capital; see Ayres et al., 1998, for a discussion of strong and weak sustainability), it seems more promising to deal with conflicts over scarce resources through demand-side management rather than supply-side management – at least in the long term.

5.3 Seven Key Aspects to Transforming Environmental and Natural Resource Use Conflicts

From the previous discussion, we now have seven key aspects to structure our analysis of an environmental conflict transformation effort:

1. Focus on interests, needs and values. Actors can better explore mutually acceptable options when dealing with a conflict if they focus on these underlying motivations than if they only focus on positions (what they want, fixed ideas of how to deal with the conflict).

2. Participatory processes: because solutions found this way are more easily implemented and supported than if they are imposed in a top-down manner by external experts. As Nicolas 'Fink' Haysom, an international mediator, once phrased it: 'The right answer in the wrong process sinks like a stone.' The 'answer' may be perfect from an external or content point of view, but if it arises in a process that is viewed as unfair and unacceptable, it is much less likely to be implemented later on. The differentiation between the process and the content is important.
3. Third-party support: experience shows that once conflict parties are caught in the dynamics of a conflict, when tension has reached the point where communication is difficult, then third-party support can help to facilitate communication as well as guide the process (Glasl, 2002; Bercovitch, 1996).
4. Sensitivity to power asymmetry: negotiations require a certain degree of power symmetry if they are to lead to mutually acceptable solutions. If one actor is far more powerful, it may well impose its interests. Power, however, is not fixed; it changes depending on the situation, and the questions being asked. Gandhi (in Iyer, 1986) indicates that peaceful non-cooperation is a form of 'power' for the 'powerless'.
5. Efficient resource use: this is the focus of the economic aspect, and speaks to the primal importance of avoiding wasteful use and exploitation practices regardless of if, and which, assumptions of the complete market framework are partly met or violated. One way to achieve efficient resource use is to provide the necessary information on true costs and benefits of the practices involved, for example by internalizing external costs. One factor related to aspects 4 and 5 is a focus on information. From an economic point of view there are wide information requirements to move closer to an ideal market situation. Information is also intimately connected with power, and from a conflict point of view information is decisive to support power symmetry between actors.
6. Systemic, linkage approach*:* this points to the interdependent nature of human and environmental interactions. Without being aware of this interdependence and 'web'-like nature of life on earth (Lederach, 2005), any effort to transform a conflict may go wrong. Thus awareness of the 'context', those aspects that are not directly at the heart of the conflict being looked at, is also necessary. Ropers et al. (2006) argue for alternating between simplifying a conflict (to make it operational) and complexifying a conflict (to avoid missing other aspects of the system). Lederach (2005) points out the need for intuition and even artistic skills (such as drawing and poetry) to grasp the essence of a conflict beyond

reductionist simplification or getting lost in detail.

7. Sustainability and relative adaptive capacity*:* humans have shaped nature and the planet, yet the sustainability approach argues that this has also had negative impacts on humans (climate change, ozone depletion and so on). Humans would benefit in the long run by considering the relative adaptive capacity of nature.

6. EXAMPLES OF ENVIRONMENTAL CONFLICT TRANSFORMATION

We are aware that it is extremely complex if all factors discussed above are taken into account in the analysis of our examples. We have to live with a certain level of imperfection and we will use the seven principles in the 32 cases in Tables 8A.1–8A.3 (in the Appendix) in the form of a number of obvious factors only: (1) involvement of third-party actors in dealing with the conflict; (2) the geographical (upstream/downstream) and economic (GDP – gross domestic product) power of a riparian actor, as well as the political environment; and (3) the context dimension of seeing if there are also non-environmental conflicts involved. A more in-depth analysis using all the seven aspects is then carried out on the Nile Basin in the following section.

According to Bercovitch and Houston (1996), mediation has a higher rate of success in solving a resource conflict (70 per cent chance of success) than it does in other types of conflict (ethnicity disputes: 67 per cent; ideology disputes: 50 per cent; sovereignty disputes: 45 per cent; security disputes: 41 per cent chance of success). What do such management efforts look like in practice, and who acts as a third party? What is the role of power asymmetry in such conflicts? Does the political system and/or other non-environmental conflicts play a role? Tables 8A.1–8A.3 seek to answer these questions. Some examples of international freshwater conflicts and their management are given in Table 8A.1, fishing conflicts in Table 8A.2, and some other environmental conflicts are listed in Table 8A.3 (explanations in the notes to the tables).

Other than some fish and timber conflicts, we do not list any efforts at dealing with 'indirect use' conflicts, such as over oil and diamonds, in the tables. We do, however, come back to suggestions on how to deal with these conflicts on a global policy level in the last section of the chapter.

Tables 8A.1–8A.3 are far from covering all environmental conflicts, and specifically focus only on international ones. No management efforts dealing with oil, mineral resources or drugs were listed. There is a selection bias through our choice of publications and internet sources that list the examples. Nevertheless, in order at least partially to reduce selection bias

once we had chosen our publications, all international freshwater conflicts from ENCOP Volumes II and III (Baechler et al., 1996; Baechler and Spillmann, 1996a, 1996b), Inventory of Conflict and Environment (ICE) Case Studies (reports accessed February 2002) and Barandat (1997), as well as all fishing conflicts from Gross (2001) and Suliman (1999) and all 'other' conflicts from Trolldalen (1992) were included in Tables 8A.1–8A.3. Selection followed the criteria that all cases have an international dimension and include efforts at non-coercive or legal conflict management. Management or 'transformation' efforts include legal steps (international or domestic) and third-party assisted or self-managed negotiations.

Of the 32 management efforts listed in Tables 8A.1–8A.3, four (12 per cent) used legal resources from domestic or international courts; three of these legal efforts were in the category of fishing conflicts, as listed in Table 8.2. In 13 of the 32 efforts (40 per cent), international organizations were involved. Only three of these were mediated by a foreign country (the USA in the Jordan dispute, Norway in the Cod War and Djibouti in the Ogaden War). Sixteen of the 32 efforts (50 per cent) were bi- or multilateral negotiations between the parties involved, and 11 of these fall in the category of freshwater conflicts. In four cases, two types of management efforts were used at the same time. Eight of the 32 efforts were very effective (25 per cent), 16 were partially effective (50 per cent) and eight were unsuccessful (25 per cent). Three of the four legal efforts were effective or partially effective. Eleven of the 13 third-party efforts (85 per cent) and 11 of the 16 self-managed negotiations (70 per cent) were very effective or partially effective.

It is obvious that a different choice of cases would lead to different results, and that judgements of 'effectiveness' are influenced by our subjective opinion concerning the effectiveness of a process. Nevertheless, the idea here is to create an initial overview. Ideally, a fully effective management effort would have a positive impact on three levels: international, intra-national and ecological. It seems that third-party assisted negotiations or legal efforts are generally more successful than self-managed negotiations. The dominance of legal management in international fishing conflicts in comparison to international freshwater conflicts indicates that the legal framework is less developed in the management of freshwaters. This is not likely to change soon. Out of the 11 international river basins (Table A8.1), only one basin (Colorado River) has all the countries of the basin in favour of the 1997 Convention on the Law of the Non-Navigational Uses of International Watercourses (UN, 1997a). A key aspect of the Convention was to try and balance the 'Obligation not to cause significant harm' (favoured by downstream countries) with the principle of 'equitable and reasonable use' (favoured by upstream countries). It is unlikely that this

Convention will solve river conflicts, because at least one member of most of the large basins has abstained, was absent or voted against it. Nevertheless, the Convention may help to clarify which points need to be discussed on a basin-by-basin basis.

The Freedom House Index of political rights and gross national income per capita index were included in the assessment in order to shed light on the importance of the political and economic context. Interestingly, according to these examples, there is no great difference in the effectiveness of management efforts in the context of economically developed and politically 'free' countries compared to those carried out in less developed countries.

7. WATER CONFLICT TRANSFORMATION IN THE NILE BASIN

The 32 cases presented in Tables A8.1–A8.3 give a broad overview that third-party assisted negotiations can be beneficial. To illustrate the seven principles outlined in the section above in more detail, the case of the Nile Basin is described in more depth. We focus on the Eastern Nile (Egypt, Sudan, Ethiopia and Eritrea) as the main sub-basin of the Nile from a water quantity point of view.

First, the background of the Eastern Nile freshwater conflict. About 86 per cent of the Nile's water flow, measured at Aswan, originates from the Ethiopian highlands. Egypt, the country furthest downstream in the Nile Basin, has been dependent on irrigated agriculture for thousands of years, and more than 95 per cent of its water resources stems from the River Nile, that is, from rain that falls outside of its territory. The countries of the Nile have a population growth rate of 2–3 per cent. Approximately 85 per cent of the water withdrawal in the Nile Basin is used in the agricultural sector. Plans for expanding irrigated agriculture in order to increase food security will increase the demand for water. All of Egypt and the north of Sudan are arid; further south in the Nile Basin, rain-fed agriculture is predominant. Rainfall is often erratic, however. The main issue of the Nile conflict concerns water allocation between the upstream and downstream countries. Egypt is concerned about any projects upstream that could decrease the water flow to Egypt, and Ethiopia is concerned about Egypt preventing it from developing its water resources. Sudan is in the middle, located between the two countries, thus sometimes in the role of an upstream country, and at other times acting as a downstream country. The Nile flow from Eritrea is not very large, so that it is not of great importance for this country. There is no basin-wide agreement that is accepted by all parties. Since 1999, however, there is a basin-wide cooperative forum, the Nile Basin Initiative

(NBI) (Mason, 2004). As an example of an environmental conflict transformation effort, this initiative is analysed below. We now assess this conflict surrounding the Eastern Nile in the light of the seven key issues identified above.

7.1 Focus on Interests, Needs and Values

One can argue that the conflict over fixed quotas of water and incompatible legal principles are positions. When, as of 1999 in the NBI framework, the riparian states began talking about their concrete interests (for example for water resource development projects such as dams for hydroelectric power or irrigation schemes), a step forward was possible. The NBI process shows the simultaneous nature of discussion of positions, interests, needs and values. While the legal questions are still being discussed, projects on the ground are moving ahead. The shared vision of the NBI, 'To achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin resources' (NBI, 2005), expresses to some extent the shared value that the countries have.

7.2 Participatory processes

Frequent meetings between the parties have helped bring about a change in perceptions and relationship. The involvement of civil society has partly been made possible through the nine annual Nile 2002 Conferences, where scientists, politicians, journalists and so on met in a non-official conference setting. Also in a smaller, informal Dialogue Workshop series, various stakeholders were able to participate in shaping and exchanging perceptions (Mason, 2005; Amer et al., 2005). The participatory process has gone a long way in giving room to subjective factors by allowing perceptions, fears and hopes to be expressed, besides purely technical details. Worries have been raised, however, that projects developed on the international level have not yet sufficiently considered the interests and needs of those people directly affected by water development projects.

7.3 Third-Party Support

The World Bank, United Nations Development Programme (UNDP) and the Canadian International Development Agency (CIDA) have acted as a facilitating third party. This has frequently been viewed as greatly supporting the cooperation process in the Nile Basin, both from a financial and from a communication point of view (Amer et al., 2005).

7.4 Sensitivity to Power Asymmetry

Ethiopia as an upstream country is geographically more powerful; Egypt as

the downstream country, but with great economic and diplomatic resources, is economically and politically more powerful. In sum there seems to be a balance that supports cooperation.

7.5 Efficient Resource Use and Information

There is a great potential to increase the efficiency of water use in the Nile Basin. According to El Quosy and Tarek (1999), an additional 20 km^3 of freshwater per year (which equals about 30 per cent of the water being used in Egypt at the moment) could be made available in Egypt through the reuse of water, changing irrigation techniques, and using water-efficient crops and cropping patterns. Markets only function if the necessary information is available (for example on the true costs and benefits of resource exploitation and consumption). The Nile conflict is far from using market forces to allocate water, although on the national level ideas of infrastructure cost recovery are being discussed and partly implemented. Nevertheless, the information aspect is also essential for other reasons. Data exchange between the countries on hydrological dynamics is essential to prepare for floods and deal with droughts. Information and transparency on planned projects between the countries as well as between the state and civil society is key to any participatory process. The NBI has created enough trust for the information and data exchange aspect to be greatly enhanced. There are now NBI offices in most of the Nile countries with experts from the other countries that ensure joint ownership and flow of information.

7.6 Systemic, Linkage Approach

The agreement of 1959 between Egypt and Sudan that followed negotiations between these countries did not take the spatial unity of the watershed into account, and it can therefore only be viewed as partially effective in managing the conflict. There is unanimous agreement that a basin-wide approach, a 'cooperative framework', to the management of the Nile Basin is of utmost importance. In 1999 the Nile Basin Initiative (NBI) was launched, with nine out of ten riparian countries being active participants in this legally non-binding transitional forum. For the first time in history, Ethiopia became an active member of a basin-wide initiative. Eritrea expressed its wish to become an active member at the 2001 NBI meeting. The criterion of adapting the management of resources to their natural system boundaries is therefore at least in part met in the case of the NBI. The systemic approach of taking the links between local, national and international systems into account, on the other hand, still needs further development. Otherwise international cooperation may lead to local water conflicts, situations where projects are agreed on between the states, but the people directly affected by the projects have no say (Mason et al., 2005).

Another important 'triggering' context factor in the case of the Nile was the end of the Cold War. During the Cold War, Egypt and Ethiopia were on opposing sides. Thus the end of the Cold War was a key factor in enabling cooperation between the countries.

7.7 Sustainability and Relative Adaptive Capacity

Due to the short time period in which the NBI has been active, its effect on sustainability is difficult to assess. The stark needs of economic development may well lead to development priorities that forsake ecological sustainability. The NBI has envisioned both supply- and demand-side projects. While Egypt has to mainly focus on demand-side projects, as all its renewable water resources are already used, some supply-side projects to increase the primary available water (for example through diversion of water and drying up swamps) are envisioned.

7.8 Summary

Applying the seven principles as a structuring tool to analyse the Nile case provides us with a mixed picture. On the one hand, steps toward greater cooperation can be identified, for example in relation to the basin approach, inclusion of multiple actors in a participatory process, assistance of a third party, and change in context and power symmetry. On the other hand, questions are also raised, for example concerning ecological sustainability, impact of international projects on local populations, and the effectiveness of the planned supply-side management projects.

8. MEANS TO TRANSFORM ENVIRONMENTAL CONFLICTS

Five key policy measures are drawn from the previous sections in order to answer the original question of this chapter: how can environmental conflicts be transformed, how can groups cooperate over the use of scarce resources? These are: (1) transparency; (2) third-party support; (3) interactive approaches to dealing with conflict (merging the three principles of focus on interests, needs and values; participatory processes; and awareness of power asymmetry); (4) systemic linkages; and (5) sustainable consumption. These follow the seven principles outlined above, yet on a more general, policy level.

8.1 Transparency

Following the focus on the importance of information, from both an economic and a non-economic point of view, transparency and access to

information turn out to be key aspects in the transformation of environmental conflict.

The transparency aspect is central in dealing with 'indirect use' conflicts, such as over diamonds and oil (Collier et al., 2003). Basically two types of measures to increase transparency are suggested. First, measures to increase the transparency over revenues stemming from the production and trade of natural resources. This needs to be carried out both at the state level and in companies engaged in these activities. Reliable and accessible information about profits and payments of governments and companies can make them accountable to the people living in these countries. An example of these kinds of measures is the Extraction Industries Transparency Initiative launched by Tony Blair (DFID, 2003). Other measures in this field are outlined by the NGO Global Witness (2006).

Second, measures need to be taken to exclude illegal actors from resource markets, to hinder them from making money that could finance conflicts. This also includes measures to create incentives for consumers to buy clean 'conflict-free' resources. Examples are the Kimberley process for diamonds, whereby raw diamonds are certified as stemming from conflict-free zones. By 2006 some 45 countries accounting for 99.8 per cent of rough diamond production have joined this process (KP, 2006). Another measure is labelling products so that consumers can choose 'clean' and 'fair' products; examples are the various labels for organic and fair trade products, such as 'Max Havelaar', or the 'Forest Stewardship Council'. Green and socially sensitive criteria for investments are another means to channel financial resources into sustainable and conflict-free activities. One business approach in this field is the World Business Council for Sustainable Development (WBCSD), with some 130 transnational firms aiming at sustainable development.

8.2 Strengthen Regional Third-Party Assistance

The examples listed in the tables, and in particular the case of the Nile Basin Initiative, show that international governmental organizations (IGOs) have an important role to play as third-party facilitators in the transformation of international environmental conflicts, and that they are often more effective in helping resolve conflicts than when the countries try to manage the conflicts by themselves. Regional IGOs should thus expand their conflict management capacity. This includes approaches such as supporting efficiency increase, demand-side management, and facilitating negotiations. In doing so, however, IGOs need to support the involved actors without taking over ownership of the process or outcome – a difficult balance.

8.3 Interactive Approaches

Interactive approaches need to be used to overcome the economic 'discourse

hegemony' and its focus on efficiency that marginalizes questions of equity, in both the analysis and the implementation of measures dealing with environmental conflicts. The interactive approaches also provide minimal boundaries to the introduction of a market or to a liberalization process, if this is a chosen measure. If these boundaries are not met (that is, if fulfilment of basic needs is not guaranteed, the power asymmetry is too great or there is a minimally escalated conflict already present), introduction of a market or a liberalization process is unlikely to be successful. Identification of these boundaries can support cooperation between potential opponents and proponents of such policies. The interactive approaches make these – the 'soft' aspects of conflicts – an explicit topic. They support the identification of the limitations of markets and suggest ways to mitigate these. This would not be possible if only economic concepts were used, as the interactive approaches help to find out in advance whether market-based instruments may be successful. A pure focus on 'objective truths' also exerts hegemony on the perceived situation and tends to devalue subjective truth. Not acknowledging this can hinder conflict transformation. Thus the need to acknowledge that there are always legitimate different perceptions of a given situation.

8.4 Systemic Linkages

The linkage approach argues that environmental conflicts always deal with physical and non-physical dimensions, and that we need to be aware of these links if the conflict transformation measures are to be effective. If such linkages are ignored, there is a danger of shifting problems from the international to the national or local level. For water and land resource conflicts, the concept of 'virtual' land and water is helpful to trace the physical linkage throughout their entire 'life cycle'. People 'eat' virtual land and water when they consume food. This can be part of the solution, that is, in physically water-scarce countries that import food and therefore have less pressure on national or international river resources. On the other hand, it can also be problematic, when the production or marketing of food is related to conflicts that are ignored because the food is consumed far away from its source of production, and moral disengagement compromises consumers' willingness to accept responsibilities (see Bandura, 1999). For resources such as oil, gold, coltan or diamonds, the actual resource can be traced from its mining, transportation and marketing to its eventual consumption, which often takes place in the affluent countries. Labels can help to clarify 'clean' resources. The socio-economic and political linkages that go hand in hand with the physical linkages are often harder to trace. Political participation of people directly affected is needed to shape the physical linkages: be this in the case of the Nile as a pastoralist in South Sudan, a highland farmer in

Ethiopia, a city dweller in Khartoum, a peasant farmer in North Egypt, or a high-tech farmer in the US (see also Mason et al., 2005).

8.5 Sustainable Consumption

A shift to sustainable consumption patterns in affluent developed countries is perhaps the most difficult but also the most effective measure to deal with many of the 'indirect use' environmental conflicts. This is because increasingly sustainable consumption patterns actually deal with the basic root causes of the conflicts. This shift can potentially also be the most effective measure for dealing with some scarcity-driven 'direct use' conflicts, as for example in the case of general trade-offs such as water availability for basic needs and water use for meat production. Sustainable consumption requires that we extend the range of responsibility that comes with consumer freedom in such a way as to include into our consumption decisions the consequences of inefficient and wasteful resource exploitation in the source countries (compare the transparency discussion above). Such measures would also have to consider changes in our entire lifestyle, for example regarding mobility and other resource-intensive consumption (such as the great increase in the demand for coltan fuelled by the boom in electronic devices such as mobile phones). In general the sustainable consumption paradigm calls for distinguishing between which basic human needs are to be satisfied through material goods (for example food, shelter), and which human needs can be better satisfied through non-material means (for example relationship, creativity).

9. CONCLUSIONS

Lack of international cooperation over internationally shared environmental resources does not usually lead to large-scale direct violence and military conflict when the conflict actors are also directly involved in the use of the resources. Rather these kinds of 'direct resource use' conflicts are related to structural violence and a lack of sustainable development. This, in turn, can lead to poverty, migration, and on the intra-national level to violent conflicts. While political and economic contexts do not seem to have much influence on the effectiveness of specific management efforts, they do have an influence on the impact of these conflicts on society, as poor and unstable states are less resilient. 'Direct resource use' conflicts may lead to direct violence on the intra-national level, but this is normally on a small scale, for example between different land users.

As opposed to 'direct resource use' conflicts, 'indirect resource use' conflicts refer to situations where conflict actors are not directly using the natural resources, but are involved in producing, mining or trading them for

commercial purposes on the global market. These conflicts are more likely to lead to direct violence. In the case of some resources such as oil, diamonds and drugs, they may even increase the risk of starting or prolonging civil wars.

Measures to be taken to transform such conflicts can be divided into coercive (for example policing or military peace-keeping, peace enforcement in the case of civil war) and non-coercive measures. The latter type can again be differentiated into legal/institutional measures, and interactive, cooperative measures. The examples in this chapter indicate that greater transparency of resource production and trade are needed to prevent and transform the 'indirect use' type of conflicts (for example oil, drugs and diamonds). For the 'direct use' conflicts (for example over water and land), greater participation of involved stakeholders, at times facilitated by an omni-partial third party, seems to facilitate cooperation. The use of concepts beyond pure economic approaches, for example with a greater focus on interests, needs and values, seems to be key in enabling such participatory processes in an effective way.

Perhaps the most difficult but also the most effective measure to prevent many 'indirect use' and some 'direct use' environmental conflicts in the long run lies in the hands of those of us residing in affluent countries. By changing our lifestyle, we can minimize wasteful resource consumption, thereby not only helping people directly suffering from environmental conflicts, but also helping to mitigate all the negative indirect impacts (organized crime, spread of diseases, drug misuse, terrorism, human smuggling and trafficking).

This chapter has focused on short- and mid-term factors that can be influenced by a conflict transformation effort. Power-based interactions still predominate, however, and long-term structural problems underlie most environmental conflicts (for example global trade patterns; see Sen, 2004, and van Beers, Chapter 2, this volume). Nevertheless, these few examples indicate that humans can cooperate over scarce resources and, in the words of Malcom Rifkind, move a step closer to peace and a sustainable future for all human beings.

ABBREVIATIONS

ADR	alternative dispute resolution
BATNA	best alternative to a negotiated agreement
CIDA	Canadian International Development Agency
ECE	UN Economic Commission for Europe
ECOMAN	Environment and Conflict Management

ECONILE	Environment and Cooperation in the Nile Basin
EEZ	exclusive economic zone. Coastal States have sovereign rights in a 200-nautical mile exclusive economic zone (EEZ) with respect to natural resources and certain economic activities, and exercise jurisdiction over marine science research and environmental protection.
EIA	Energy Information Administration
ENCOP	Environment and Conflicts Project
EU	European Union
GDP	gross domestic product
GNI	gross national income
GTZ	German Development Agency
HEP	hydroelectric power
HEPG	hydroelectric power generation
ICE	Inventory of Conflict and Environment. A web-based collection of some 100 environmental conflict case-studies.
ICJ	International Court of Justice
IFRC	International Federation of Red Cross and Red Crescent Societies
IGO	international governmental organization
MAP	Mediterranean Action Plan
NATO	North Atlantic Treaty Organization
NBI	Nile Basin Initiative. Transitional cooperative framework initiated by the Nile countries to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources.
NCCR North–South	National Centre for Competence in Research North–South, Research Partnerships for Mitigating Syndromes of Global Change
NGO	non-governmental organization
OAU	Organization of African Unity
UNO	United Nations Organization
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural

	Organization
WBCSD	World Business Council for Sustainable Development

NOTE

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APPENDIX

Table 8A.1 International freshwater conflicts (explanations after the tables)

Title (period of conflict analysed)	Parties: Country	Parties: Political Rights Index [1]	Parties: GNI per capita US$ [2]	Parties: Political stance on Convention [3]	Environmental interests	Conflict issues (non-environmental)	Conflict management effort and date	Conflict management effort: Legal	Conflict management effort: 3rd party IGO [8]	Conflict management effort: 3rd party state	Conflict management effort: Negotiations	Success/failure: Effective	Success/failure: Partial	Success/failure: Unsuccessful	Relations prior to first conflict management: Cooperative	Relations prior to first conflict management: Neutral	Relations prior to first conflict management: Hostile	Relations prior to first conflict management: Armed conflict
						Africa												
Nile Basin (1959, 1998–2002) [e]	Burundi	7	160	Ag	Egypt: irrigation Sudan: irrigation, flood control, reduction of sediment load, HEPG [4] Ethiopia: irrigation, minimize erosion, HEPG [4]	Egypt: regional hegemony Ethiopia, Sudan, Egypt: stop foreign support of internal opposition	Sudan–Egypt Nile Agreement (1959), not accepted by other upstream countries				X		X				X	
	D.R. Congo	6	150	Ab														
	Egypt	5	870	A														
	Eritrea	6	180	Ab														
	Ethiopia	4	110	A														
	Kenya	6	240	F			Nile Basin Initiative (NBI): nine countries (1999). Eritrea expressed wish to join NBI (2001). NBI is supported by World Bank, UNDP, CIDA		X		X	X						
	Rwanda	6	140	A														
	Sudan	7	270	F														
	Tanzania	6	160	A														
	Uganda	6	190	Ab														
		(-1990)	(-1994)															

Table 8A.1 continued

Title (period of conflict analysed)	Parties: Country	Political Rights Index [1]	GNI per capita US$ [2]	Political stance on Convention [3]	Environmental interests	Conflict issues (non-environmental)	Conflict management effort and date	Conflict management effort: Legal	3rd party IGO [8]	3rd party state	Negotiations	Success/ failure: Effective	Partial	Unsuccessful	Relations prior to first conflict management: Cooperative	Neutral	Hostile	Armed conflict
America																		
Colorado River salinity problem (1960s–1973) [h]	Mexico	5	1 480	F	Mexico: irrigation water that is not too saline		'Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River' (1973)				X	X			X			
	USA	0 (-1972)	8 169 (-1975)	F	USA: discharge drainage flow into Colorado River													
					USA: discharge drainage flow into Colorado River													
Asia																		
Aral Sea (1991–95) [a, d]	Afghanistan	7	-	Ab	Kyrgyztstan, Tajikistan: HEPG[4] and irrigation	Oil and pipeline transportation of oil	Aral Rehabilitation Agreement (1992)				X			X		X		
	Kazakhstan	6	1 380	F														
	Kyrgyztstan	5	470	-	Uzbekistan, Kazakhstan, Turkmenistan: irrigation													
	Tajikistan	7	270	Ab			Declaration of Nukus (1995) UN support		X				X					
	Turkmenistan	7	720	Ab														
	Uzbekistan	7	710	A														
	Iran	6 (-1993)	2 300[5] (-1997)	F														

Asia														
Ganges River system (1955–82) [g]	Bangladesh India	4 2 (-1974)	200 190 (-1975)	F A	India: reduce siltation in Hooghly River and Calcutta port Bangladesh: secure sufficient flow in dry season		Temporary agreement (1975) Five Year Ganges Water Agreement (1977), UN support	X	X X	X	X	X		
Indus River (1947–70) [d]	India Pakistan	2 3 (-1972)	110 170 (-1970)	A A	Access to water for irrigation	Sovereignty over Kashmir	Indus Water Treaty (1960), facilitated by World Bank	X	X			X		
Mekong Basin (1970s–2000) [c]	Cambodia China Laos Myanmar Thailand Vietnam	7 6 7 7 3 7 (-1985)	200 410 290 - 2 130 170 (-1993)	F Ag F Ab F F	Thailand: water Laos: HEPG[4] Cambodia: fishery Vietnam: reduce salt water intrusion		Mekong River Commission (1995) (China and Myanmar are not active members)		X	X		X		
Europe														
Danube River, Gabcikovo-Nagymaros dam (1977–97) [a]	Czech Republic Hungary Slovakia	1 1 2 (-1985)	3,55 3,88 2,54 (-1994)	F F F	Hungary: HEPG[4], prevent environmental degradation, navigation Slovakia: cheap HEPG[4], navigation		London Protocol (1992) between Slovakia and Hungary, mediated by EU 1997 ICJ Court Ruling	X X		X	X	X		
Rhine basin (1950–2002) [d]	Austria Belgium France Germany Holland Italy Liechtenstein Luxembourg Switzerland	1 1 1 1 1 1 1 1 1 (-1992)	23 600 22 220 22 600 24 670 22 410 19 950 - 40 420 37 130 (-1993)	F A A F F F F F -	All: navigation, renaturation. Holland, Germany: reduce pollution, flood control. Upstream countries: minimize costs.		International Commission for the Protection of the Rhine (1950) Chloride Convention (1976) Rhine Action Programme (RAP) (1987)		X X X		X			

Table 8A.1 continued

Title (period of conflict analysed)	Parties: Country	Parties: Political Rights Index [1]	Parties: GNI per capita US$ [2]	Parties: Political stance on Convention [3]	Environmental interests	Conflict issues (non-environmental)	Conflict management effort and date	Conflict management effort: Legal	Conflict management effort: 3rd party IGO [8]	Conflict management effort: 3rd party state	Conflict management effort: Negotiations	Success/ failure: Effective	Success/ failure: Partial	Success/ failure: Unsuccessful	Relations prior to first conflict management: Cooperative	Relations prior to first conflict management: Neutral	Relations prior to first conflict management: Hostile	Relations prior to first conflict management: Armed conflict
Middle East																		
Euphrates-Tigris Basin (1980–90) [a]	Iran	5	3 520	F	Syria, Turkey, Iraq: irrigation water	Iraq, Turkey: Kurdish problem	Joint Technical Commission (1982): Iraq, Syria, Turkey				X			X				X
	Iraq	7	2,40	-	Turkey: HEPG[4]	Syria, Iraq, Turkey: regional hegemony												
	Syria	6	1,67	F														
	Turkey	3	1,32	Ag														
		(1985)	(1985)				Protocol on Matters Pertaining to Economic Cooperation (1987): Turkey, Syria				X		X					
Jordan River (1967–94) [a]	Israel	2	11 490	A	Israel and Jordan: securing freshwater	Jordan: historical right to land												
	Jordan	5	1 120	F														
	Lebanon	5	1 340	Ab														
	Syria	6	980	F		Israel: self-preservation	Peace Treaty (1994): Jordan and Israel, brokered by USA			X		X						X
		(1990)	(1991)															

Table 8A.2 International fish conflicts

Title	Parties: Country	Political Rights Index[1]	GNI per capita US$[2]	Environmental interests	Conflict issues (non-environmental)	Conflict management effort and date	Conflict management effort: Legal	3rd party IGO[8]	3rd party state	Negotiations	Success/failure: Effective	Partial	Unsuccessful	Relations prior to first conflict management: Cooperative	Neutral	Hostile	Armed conflict
Cod War (1974–76)[e]	Great Britain	1	15 180	Iceland: extension of exclusive economic zone, secure its fish resources and avoid resource depletion England: secure fish resources	Iceland: public opinion against NATO[9] military bases on Iceland	United Nations Security Council brokerage (1975)		X					X			X	
	Iceland	1	23 150			NATO and Norwegian brokerage (1976)		X	X		X						
		(-1975)	(-1989)														
Exclusive Economic Zone (EEZ) between Greenland and Jan Mayen (1977–93)[e]	Denmark	1	23 430	Denmark, Norway: expand EEZ to 200 sea miles. The distance between Greenland (Danish) and Jan Mayen Island (Norwegian) where fish were found is less than 400 sea miles.	National security	Negotiations lead to total ban on fishing in 1982 and 1983				X		X				X	
	Norway	1	25 470			Denmark approaches the ICJ, which then decides the conflict, accepted by both parties (1993)	X				X						
		(-1985)	(-1990)														
Morocco and Spain: fishing rights (1995)[a]	Morocco	2	1 12	Morocco: preserve fish resources Spain (EU): access to fish resources	Morocco: protecting expanding local industry Spain: faced with similar problem in Canada causing severe financial losses	Euro-Mediterranean Conference (1995): Morocco, EU, Mediterranean States		X			X					X	
	Spain (EU)	1	14 37														
		(-1995)	(-1995)														

Table 8A.2 continued

Title	Parties: Country	Political Rights Index[1]	GNI per capita US$[2]	Environmental interests	Conflict issues (non-environmental)	Conflict management effort and date	Conflict management effort: Legal	3rd party IGO[8]	3rd party state	Negotiations	Success/failure: Effective	Partial	Unsuccessful	Relations prior to first conflict management: Cooperative	Neutral	Hostile	Armed conflict
Pacific Salmon Treaty (1985–99) [e]	Canada	1	19 800	Protection of Salmon, fish quotas		Pacific Salmon Treaty I (1985)				X		X		X			
	USA	1	23 560			Multi-track negotiations:				X	X						
		(-1990)	(-1990)			Pacific Salmon Treaty II (1999)											
Trawling in Southeast Asia (1960s–1980s) [f]	Indonesia	5	810	Protect own small-scale fishermen in 3 km coastal zone, expand large-scale fish trawling intruding in foreign 3 km coastal zone.	Ethnic tensions between immigrant Chinese and indigenous Malays or Indonesians	Malaysia initiates measures to prohibit trawlers, partial ban (1980s)	X					X			X		
	Malaysia	3	3 190														
	Myanmar	7	-														
	Thailand	3	2 130														
	Vietnam	7	170				X				X						
		(-1975)	(-1993)			Indonesia: full ban on trawling in waters of Java and Sumatra (1980)											
Turbot war (1995) [e]	Canada	1	19 880	Canada: protection of Turbot		Agreement is accepted by Northwest Atlantic Fisheries Organization		X		X	X					X	
	Spain	1	14 370	Spain: access to fish in 'Grand-Bank'													
		(-1995)	(-1995)														

Table 8A.3 Other international environmental conflicts

Title	Parties: Country	Political Rights Index[1]	GNI per capita US$[2]	Environmental interests	Conflict issues (non-environmental)	Conflict management effort and date	Conflict management effort: Legal	Conflict management effort: 3rd party IGO[8]	Conflict management effort: 3rd party state	Conflict management effort: Negotiations	Success/failure: Effective	Success/failure: Partial	Success/failure: Unsuccessful	Relations prior to first conflict management: Cooperative	Relations prior to first conflict management: Neutral	Relations prior to first conflict management: Hostile	Relations prior to first conflict management: Armed conflict
Air pollution in the ECE[10] region (1960s-1980)[g]	Countries of Europe			Northern countries (Scandinavia) net importers: reduce effects from foreign pollution Southern, Central Europe, net exporters (e.g. UK and France): prove that pollution was not the main cause of acidification		Accumulation of scientific data, countries agreed on Geneva Convention (1979). Ratification (1983)		X			X			X			
Coastal based pollution of Mediterranean (1970–2001)[g]	Albania	3	660	North: protection from coastal outlets, EC standard. South: avoid additional production costs, include river and airborne pollutants	Conflicts e.g. Italy–Tunisia over median line in sea; Turkey–Greece over Cyprus; Libya–Tunisia over oil; Lebanon–Syria–Israel conflict	Mediterranean Action Plan (MAP, 1975) e.g. including the Land-Based Sources Protocol (1980). MAP phase II (1995). Facilitated by UNEP[11]		X			X				X		
	Algeria	6	1 590														
	Cyprus	1	11 520														
	Egypt	6	990														
	Ex-Yugoslavia	6	-														
	France	1	24 700														
	Greece	1	10 900														
	Israel	1	14 960														
	Italy	1	19 090														
	Lebanon	6	2 590														
	Libya	7	5 670[6]														
	Malta	1	8 400														
	Monaco	2	-														
	Morocco	5	1 120														
	Spain	1	14 370														
	Syria	7	1 210														
	Tunisia	6	1 820														
	Turkey	5	2 810														
		(-1995)	(-1995)														

Table 8A.3 continued

Title	Parties: Country	Political Rights Index[1]	GNI per capita US$[2]	Environmental interests	Conflict issues (non-environmental)	Conflict management effort and date	Conflict management effort: Legal	3rd party IGO[8]	3rd party state	Negotiations	Success/failure: Effective	Partial	Unsuccessful	Relations prior to first conflict management: Cooperative	Neutral	Hostile	Armed conflict
Ethiopian–German access to genetic resources, (1985–87)[g]	Ethiopia W. Germany German Development Agency (GTZ)	7 1 (-1986)	120 24'670 (-1993)	Ethiopian gene bank financed by GTZ, in return for duplicates Ethiopia: sovereignty over its botanical resources Germany: economic interest in Ethiopia's barley		Two years of negotiations that failed, GTZ officials left Ethiopia (1987)				X			X		X		
Mount Nimba: impact of iron ore mining on World Heritage Site[g] (1992–93)	Guinea Ivory Coast Liberia Transnational companies	6 4 7 (-1992)	520 790 490[7] (-1992)	Guinea, Liberia: mining revenues Transnational companies: mining iron ore UNESCO: intact boundary of World Heritage Site NGOs:[13] environmental protection Locals: protect subsistence farming	Influx of refugees from Liberian civil war into Guinea and Ivory Coast part of Mount Nimba	Expert mission recommends a revised boundary, accepted by Guinea (1993), UNESCO[12] World Heritage Committee		X			X				X		
Ogaden conflict (1963–64)[i] (1977–78)	Ethiopia Somalia	5 7 (-1972)	140 110 (-1983)	Somali pastoralists live and move in Kenya, Ethiopia and Djibouti: rights to grazing and water. Ethiopia: security of its frontiers	Access to oil, territorial dispute. Ogandeni uprising against Ethiopian government in 1963, supported by Somalis.	Ceasefire is mediated by OAU[14] only after several hundred are killed (1964) Djibouti mediated after Somaila was defeated (1978)		X 		 X	X X						X

Explanations of Tables 8A.1–3:

Environmental interests: A country's interest in the natural resource in dispute.
Conflict issues: This column depicts non-environmental issues under conflict. Where the column has been left empty it denotes a purely environmental conflict.
Conflict management effort: Not all management efforts during the period analysed are discussed; representative examples were chosen.
Legal: Is used to cover all legal recourses taken through an international or domestic court, or through legislation. Negotiations leading to a legal agreement are included in the categories below.
3rd party IGO: International organization that either facilitated or mediated the conflict according to the following criteria: 'third-party involvement involves a relationship between the conflicting parties and the third party; third-party behaviour of some sort, within a context, and outcomes consequent to that behaviour that have an affect on the parties, their interaction or the context of the conflict' (adapted from Bercovitch, (1996, p. 3).
3rd party state: A mediating state that is a decisive ingredient in a mediation effort.
Negotiations: Either bilateral or multilateral negotiations initiated on the parties' own initiative.
Success/failure: 'We define mediation as successful when it has made a considerable and positive difference to the management of a conflict and the subsequent interaction between the parties. It is defined as being of limited success when it has achieved a cease-fire or a break in the hostilities only. We contrast this with a second outcome category, failure, which is defined as occurring when mediation has had no discernable or reported impact on the dispute or the parties behaviour.' (Bercovitch et al., 1991; in Bercovitch, 1996). Success is never absolute, so we have adapted this to the categories: effective, partial success, and unsuccessful.
Relations prior to conflict management: This depicts the state of relations between the various parties during the period of conflict analysed and prior to the management effort. In the case of two or more management efforts discussed it depicts the state of relations up until the last management effort.

a. ICE Case Studies (reports accessed 17.04.2002)
b. TED Case Studies (reports accessed 17.04.2002)
c. The Water Page (2000)
d. Barandat (1997)
e. Nile: Mason (2004), Fish: Gross (2001)
f. Fairlie (1999)
g. Trolldalen (1992);
h. Marty (2001)
i. Soviet Foreign Ministry (1977)
1. Freedom House Index (10.04.02). Except if marked otherwise (data availability), data are from the year in brackets for all the countries so as to make a rough international comparison possible – even if the figure changes during the period. Using a scale from one to seven, with one representing the highest degree of freedom.
2. Gross national income per capita, World Bank (2001). Except if marked otherwise (data availability), data are from the year in brackets for all the countries so as to make a rough international comparison possible – even if the figure changes during the period.
3. UN (1997c) Vote on the Convention on Law of Non-Navigational Uses of International Watercourse. Key for the symbols used: F = In favour; Ag = Against; A = Abstain; Ab = Absent.
4. Hydroelectric power generation
5. Statistics from 1992
6. Statistics from 1989
7. Statistics from 1987
8. IGO: international governmental organization
9. NATO: North Atlantic Treaty Organization
10. ECE: UN Economic Commission for Europe
11. UNEP: United Nations Environment Programme

12. UNESCO: United Nations Education, Scientific and Cultural Organization
13. NGOs: non-governmental organizations
14. OAU: Organization of African Unity