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International Regime Development: Lessons from the Rhine Catchment Area*

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WATER RESOURCES AND REGIME DEVELOPMENT

Water resources are international by nature. Neither evaporation and precipitation, nor river streams respect the boundaries between states. At least 215 river basins are shared by two or more countries. These basins encompass about 47 percent of the total land area of the earth (Gleick 1993, p. 436).[1] It comes as no surprise that issues dealing with the quality of international rivers or the water quantity in international basins appeared on the foreign political agenda of many states. Many of these issues have resulted in the development of international regimes. For many issues, "social institutions governing the actions of those involved in specifiable activities or sets of activities" (Young 1989) have been created. In less abstract terms, international regimes could be defined as "arrangements that pertain to well-defined activities, resources or geographical areas," consisting of "principles, rules, norms and decision-making procedures, around which actors' expectations converge" (Krasner 1984, p. 2).

In this paper the development of the regime concerning the pollution of the river Rhine, one of the oldest of such regimes in Europe is analyzed. The paper starts with an overview of the characteristics of the Rhine catchment area. Because of these characteristics, the development of an international regime was perceived necessary. Obstacles, however, hampered the progress of the development of the Rhine regime. Many of the observed barriers have gradually disappeared in the course of time. The ways in which institutional barriers, cognitive barriers and political barriers have been dealt with are described. The now existing Rhine regime is generally considered a sophisticated regime. Generally speaking, the development of the Rhine regime was an interstate affair. States, represented by administrators and politicians are the main actors in the international political arena. However, nongovernmental organizations (NGOs) also play a role. The role of environmental NGOs in the development of the regime for the river Rhine is emphasized.

Given the fact that Thailand is part of the Mekong catchment area, the lessons of Rhine regime development are important ones to learn. This is especially true since Thailand is a downstream country, and as the subregion continues development, it is likely that problems of pollution will grow more severe.

THE RHINE CATCHMENT AREA

If we focus on the characteristics of the Rhine catchment area from a spatial point of view, changes can be perceived, both in a physical sense and in terms of the societal functions of the area. The international Rhine regime has the task of balancing the various societal demands placed on the catchment area.

The Rhine River originates on the Gotthard Massif in Switzerland, where small streams come down from a height of more than 3,400 meters. From the Gotthard Massif the Rhine River meanders over a distance of 1,320 km before discharging in the North Sea. On its way to the North Sea, the flow of the Rhine increases as a result of precipitation and the addition of water from several tributaries. At the Dutch border the average annual flow is 2,378 m^3/s, more than twice as much as at the Swiss border (Internationale Kommission zum Schutze des Rheins 1994, p.70). Its flow, length and the size of its catchment area (200,000 km^2) makes the river Rhine the most important West-European river. On a world scale however, the Rhine is actually a minor river. For instance, rivers like the Amazon (6,280 km), the Mississippi (5,985 km), the Mekong (4,500 km), the Volga (3,900 km) and the Danube (2,860 km) are much longer and have a much larger catchment area (Shiklomanov 1993, p.16).

The "riparian states" are those countries which are reliant in some capacity on the Rhine. In all, nine countries are riparian states, including Italy, Austria, Liechtenstein, Belgium, Luxembourg, Switzerland, France, Germany, and the

downstream Netherlands. The latter four are the most important as they are the most dependent on the Rhine catchment area. While crossing the territories of these four countries Rhine water fulfills different societal functions. Figure 1 indicates that from a geographical point of view an asymmetry in societal functions exists.

About 20 million people depend on Rhine water as a source of drinking water. Most of them live in Germany and in the Netherlands. The Dutch are the most dependent on the Rhine, as in the western part of their country no alternatives for drinking water production exist. Groundwater is too brackish to be used as a source for drinking water.

All over the basin, industries use Rhine water as process or cooling water. Important industrial concentrations can be found in Switzerland near Basel, in Germany around Mannheim and in the Ruhr area and in the Rotterdam port area of Holland. The Rhine catchment area is one of the most important industrial areas of the world. For instance, about 20 percent of the world production of (dangerous) chemical substances is produced in the catchment area (Huisman 1990).

A clear asymmetry in societal functions can be perceived if we focus on irrigation and hydropower. The irrigation function is especially important for the Netherlands, as half of the Netherlands is below sea level. Because of this, the Dutch always have to fight salt intrusion. Rhine water is used to irrigate the polders, so salt sea water and brackish groundwater can be kept out of the country. Although some hydropower is produced at the sluices in the Rhine in the Netherlands, steeper parts of the catchment offer the best possibilities for hydropower development. Most hydropower stations can be found in France, where ten stations operate in the canalized part of the Rhine (the Grand Canal d'Alsace). Most Swiss and German power stations are located in the steeper tributaries of the river Rhine.

The Rhine catchment area also offers leisure opportunities. Amenity values are attributed to the upstream parts of the river, for instance Lake Constance and the Schaffhouse falls, the middle part, the German Romantic Rhine and the delta area in the Netherlands, where some wetlands with an international status (Ooypolder, Biesbosch, Waddensea) can be found. Several sites in the catchment area are also used for aquatic sports like swimming, sailing, and sport fishing. Professional fishing (on eel) is mainly concentrated in the Netherlands.

Due to favorable distribution of precipitation over the catchment area, the Rhine has a rather equal discharge, which made the river extremely useful for navigation. To improve the natural situation, parts of the river were canalized. Today, the Rhine is a very important inland waterway which connects Rotterdam Harbour, the largest sea port of the world, with Duisburg, the largest inland port of the world, and other industrial areas in Germany and Switzerland. Since 1992, it is even possible to go by boat from Rotterdam as far as the Black Sea. Over 130 million tons of goods a year are transported by boat on the Rhine (Huisman 1990).

Finally, the Rhine is also used as a sewer, both for industry and residentially. Important companies like Sandoz and Ciba-Geigy in Switzerland, BASF, Hoechst and Bayer in Germany and MDAP, a French potassium mining company, discharge their waste waters in the river. Also, 55 million people reside and work in the catchment, with an average population density of 250 persons per square kilometer. Their waste waters also flow into the river.

Due to the multiple functions of the Rhine catchment, conflicts arose. This biggest conflicts arose over the use of the Rhine as a sewer where the fulfillment of the sewer function in the upstream countries was perceived to hamper the downstream functions. Dead fish and pollution of the surface waters conflicted with downstream drinking water interests. In order to bring the different functions of the Rhine catchment into a balance, the governments of the riparian states, especially downstream Netherlands, initiated a process of regime development (Schwabach 1989, p.470). This process started more than 50 years ago. Over the years, progress has been impeded by various situations which have acted as barriers to smooth and efficient interstate cooperation.

In addition to barriers at the institutional level, we can make the distinction between cognitive and political impediments. It should be emphasized that this is a purely analytical distinction; in practice, the barriers are very much linked. As will be shown, many of these barriers have been resolved.

RESOLVING INSTITUTIONAL BARRIERS

Institutional barriers for regime development first show up when a framework for discussion between the relevant national governments is lacking since the absense of a framework tends to lead to communication which is unstructured and tedious. Once a project organization has been created, other institutional obstacles may still emerge and hinder a quick resolution of the problem, especially when tasks and competencies of the organization are not clearly defined. Institutional barriers also surface when there is too little administrative assistance (specifically, a

multi-lingual secretariat) assigned to the consultative body. Further, inadequate feedback mechanisms and the absence of a clear dispute resolution procedure can also lead to delays. Delays can also occur when some of the relevant parties fail to participate at the appropriate administrative or political level. A final institutional barrier that is extremely difficult to overcome in the international context is the veto power that every party can use to prevent impingement upon sovereignty and national interests. International decision-making can usually only take place if the support is unanimous.

The first institutional barrier, the absence of a framework for discussion, was perceived by the Dutch government when they wanted to consult the governments of the other riparian states. Prognoses before World War II suggested that Amsterdam would become increasingly dependent on Rhine water for its drinking-water supply (Krul 1952). So, the proposal by representatives of the French potassium mines in the Alsace to discharge waste salt water into the Rhine gave rise to anxiety among Dutch drinking-water companies. After the war—when the mines had actually begun to discharge—studies showed that horticulture in the Netherlands would also suffer from increased salinization. As a structure for debate was missing, the Dutch Ministry of Transport and Public Works decided to start consultations. An appeal was made through diplomatic channels to other riparian states to discuss the Rhine problem informally. This appeal resulted in the establishment of the International Rhine Commission (IRC) in 1950. A limited number of actors from the Rhine catchment area started to communicate in an informal and initially rather unstructured way on Rhine quality issues.

Attempts by the Dutch in the 1950's to prevent the salt load increasing any further were barred by the French and Germans. They argued that the IRC was exclusively a research organization and had no authority to discuss policy proposals. This second institutional barrier was resolved in 1963, when several years of negotiation resulted in a formalization of the tasks and competencies of the commission. According to the Treaty of Bern, the IRC was authorized carry out research into the nature, extent and origin of the pollution in the Rhine, and to propose measures and prepare international regulations (agreements). However, the Germans and the Swiss successfully opposed Dutch proposals to extend the competence of the IRC to the tributaries of the Rhine.

A third institutional barrier, the existence of an inadequate feedback mechanism, was also resolved by the 1963 Treaty of Bern. The formal structure of other international organizations was copied by the riparian states. The IRC was put under the leadership of a president who was appointed for three years. The IRC president was responsible for chairing a plenary conference which would take place once a year. During these plenary meetings, delegates from the states along the Rhine must reflect on IRC policy and elaborate this policy. In addition, it was formally agreed that information on different aspects of Rhine pollution could be exchanged in the context of working groups.

According to the Treaty of Bern, an official permanent and multi-lingual secretariat at the Bundesanstalt für Gewässerkunde in Koblenz would provide support for the commission and would, among other things, compile their annual reports. The costs of the IRC secretariat would be apportioned according to a fixed factor to the four riparian states and the European Community (EC), which joined the IRC in 1976.

Another institutional barrier was perceived by the Dutch camp around 1970. Technically speaking, the IRC was highly qualified. However, because of inadequate government supervision, it was said to operate in a vacuum. As the Dutch saw it, the delegations lacked the 'political skill' to get concessions from the various state governments. Given the increase in pollution the Dutch government decided that the time was ripe to convene a special ministerial conference on Rhine pollution. By making a number of diplomatic moves, they were able to convince the other riparian states that such a conference was important. Since 1972, ministerial conferences on Rhine pollution have been held periodically.

However, not all institutional barriers could be resolved. Although the Dutch government tried several times to change the veto rule, all delegations still have veto power so recommendations are hindered by the requirement for unanimity in decision-making. After negotiation the only concession allowed to the Dutch by the upstream countries is that abstention from voting by a party doesn't affect unanimity.

Today, most of the institutional barriers to regime development have been resolved. Many cognitive barriers have disappeared as well.

RESOLVING COGNITIVE BARRIERS

Barriers at the cognitive level will arise if those involved draw different conclusions about the seriousness or the causes of a problem. In water pollution problems, there can be a lack of agreement on the exact effect certain concentrations of particular materials have on the water system because within the "vast chain of things" a multiplicity

of relationships can be drawn (Clarenburg 1990). Cognitive barriers may also emerge if there is uncertainty about the possible ways of reducing pollution. For instance, there may be inadequate understanding of the nature of the production processes carried out by discharging industries and insufficient information about available purification technology. In addition, the actual cost which will eventually be attached to reducing discharges may be unknown. This implies that the social costs and benefits of the options identified should be gathered.

The cognitive barriers which appeared during the negotiations on the Rhine regime can be classified in four categories. At first, general knowledge concerning Rhine water quality was limited. Secondly, a difference in perceptions between the riparian states on the effects of chloride discharges occured. A third category of cognitive barriers emerged when the Rhine was said to be polluted by a 'cocktail' of chemicals. Finally, cognitive hurdles dealing with the ecology of the catchment area existed.

Initially, in the early 1950's, no data were available that could give an indication of the severity of the Rhine pollution. For this reason, the IRC put emphasis on making an inventory of pollution problems in the widest sense. Their first move was to harmonize a number of measuring procedures and to set up an international monitoring network. In the four riparian states, nine monitoring stations were set up, at even increments across the catchment area. The measurement results were annually published by the IRC, so insights became more widely distributed (Internationale Kommission zum Schutze des Rheins gegen Verunreinigung 1965, pp. 8-10). Trend analysis of the data led to some concern, as it was established that the Rhine, particularly in its lower reaches, was under heavy pressure. Industrial centers such as the Ruhr Valley, the Moselle River, the potassium mines, and the German state of Baden-Württemberg were identified as the main sources of pollution.

In 1954, the Dutch IRC delegation requested that there should be no further increase in the chloride load. This caused considerable disagreement. The French contested the definition of the problem developed by the Dutch, which identified the French potassium mines as being primarily responsible for the elevated salt load. The French contended that the potassium mines were not the only source of chloride discharge in the catchment area. In addition, the French suggested that the problems the Dutch ascribed to chloride discharge stemmed from the fact that the Western Netherlands lay below sea level, so the main cause of salinization was intrusion of salty ground water. The Dutch IRC delegation reacted to this by elaborating their argument and by trying to underpin it more effectively. After lengthy discussion, the arguments presented by Dutch hydrologists to try and influence the French point of view led to a French proposal that IRC working groups should be set up to study the problem. Research eventually showed that the potassium mines were in fact the main source of pollution in the catchment area, but that soda works in France and Germany, coal mines in the Ruhr and communal discharges originating in the catchment area as a whole also made significant contributions to the salt load as measured at the Dutch border.

From the mid-1960s, research was done on how to reduce the discharge of chlorides from the French potassium mines. Although a reduction of these discharges was considered the best solution to the problem, about 20 years of research had to follow concerning the methods on how to do this. Multiple options were studied. First, research concentrated on assessing the possibility of storing salt in the Alsace. Subsequently, the feasibility of selling salt to a soda works and of solving the problem by transporting it to the North Sea were studied. The fourth option involved laying a pipeline to the Channel. And the final option was to discharge the salt into the River Doubs in France. The Dutch actively participated in some of the subsidiary studies in an attempt to speed up the process. It took five years, however, before the message came from France that storing the salt was in principle the most favorable option, but that research had to be done concerning the exact location of the stacks. Disagreement between France and Germany about proposed locations, however, resulted in two new research projects. For another eight years injection of the waste salts in the sub-soil was reconsidered. Also the feasibility of marketing the salts by a salt factory was studied. Cognitive barriers concerning chlorides could only disappear when the riparian states were willing to cooperate. The fact that the feasibility of all methods to resolve the problem was intensively studied by IRC working groups contributed to the acceptance of a Dutch proposal to solve the problem. This proposal could be perceived as being the most efficient way of dealing with the chloride problem.

Even before the chloride issue was resolved, the combination of the growing environmental awareness at the end of the 1960's and the accidental discharge of the pesticide endosulphane, which resulted in great number of dead fish, made the riparian states more aware of the vulnerability of the catchment area. The general perception which arose was that the river was heavily polluted with harmful substances and the question was raised on how to approach this problem. New cognitive barriers emerged concerning the presence, harmfulness and origin of the substances. These cognitive barriers were resolved in a very pragmatic way. The Oslo Dumping Convention had just come into force, and this provided a context for a Dutch proposal for a convention on chemical substances. For that convention, priority lists were compiled of groups of substances. These so-called 'black' and 'grey' lists contained a number of substances that were thought to be either toxic or hazardous. Both lists were adapted slightly and added to the Rhine Chemicals

Treaty. In order to stimulate the progress of the discussions further, the Dutch delegation again put forward proposals to specify the 'black' and 'grey' lists, because—with the exception of mercury and cadmium—only groups of substances had been selected for normative definition. These Dutch proposals were also developed pragmatically as on pure scientific grounds a selection could not be made. The proposals were intended to stimulate further research within the framework of the IRC. Cooperative IRC research resulted in a consensus on which of an anticipated 1500 substances should be considered for further normative definition. Specific guidelines were developed on the basis of the research reports submitted by the riparian states, and grateful use was made of reports from external researchers commissioned by the EC. These reports helped in reaching a consensus on the degree to which a particular material was toxic, persistent or bio-accumulative. In addition, the reports established whether a particular material was produced or used in the Rhine catchment area. In particular, it was determined whether the substance was discharged into the Rhine. The result of these research efforts was a list of 46 priority substances. Cognitive barriers disappeared, as the vague idea of a Rhine water being a 'chemical cocktail' was now dispensed with.

Finally, multiple perceptions concerning the ecology of the catchment existed. Research was required and done to establish a reference situation for a more ecologically sound catchment area. The fragmented knowledge that existed on this topic at several research institutes in the Rhine catchment area was assembled by a special IRC working group. These efforts resulted in an ecological masterplan, Salmon 2000, which not only gave an outline for a more ecologically sound catchment, but also outlined the obstables to achieving this. These hindrances concern not only water quality, but also the hydrology and morphology of the catchment area.

It should be noted that cognitive consensus is an important condition for the successful resolution of international environmental problems. It is not a sufficient condition, however, because ultimately those involved must be ready to engage in substantive action.

RESOLVING POLITICAL BARRIERS

An absence of political will on the part of the governments involved to actually acknowledge that there is a problem and to try to adopt adequate measures forms a third barrier that must be overcome (Wettestad 1988; Saetevik 1988). Governments are not always willing to accept policy proposals dealing with an abatement of water pollution. First of all, national sovereignty restricts the number of proposals which are acceptable. Secondly, proposals might be considered too expensive. Upstream countries with less interest in stringent policies than countries that lie downstream will be more ready to point out the undesirable effects of an expensive and restrictive regime (List and Rittberger 1992, pp. 90-106). Possible tax increases that government would impose on industry or the increased demand that the suggested measures make on the government's budget will be said to cause the greatest concern, especially if a slump in the economy puts budgets and jobs under pressure. Further, proposed measures may be opposed if the problem involved has a 'not in my backyard' characteristic, for instance, where waste water discharges are justified by the argument that they cannot be avoided because reducing discharge would mean that contaminants would have to be stored or processed elsewhere in the catchment area, which merely means moving the problem.

A lack of political will is a hurdle that must not be underestimated in dealing with cross-border pollution and the creation of an international regime. An absence of political will can have repercussions at the institutional and cognitive levels. Although Dutch delegations tried several times to give the IRC a more supranationalistic character, upstream countries succeeded in opposing this. Formally, the IRC has no authority over the tributaries of the Rhine. In practice, however, IRC-working parties also discuss conditions in tributaries. And, as mentioned above, the countries upstream also refused to allow some flexibility in the unanimity requirement attached to making recommendations. Decision-making on the basis of a majority was only acceptable to the Dutch. Furthermore, calls for extra research may mask the absence of political will and might delay the process of regime development as in the case of chloride pollution, where a lack of political will in the upstream countries to accept Dutch policy proposals resulted in requests for extra research. Upstream countries were also the most reluctant to accept the Dutch proposals concerning chlorides and chemical pollution and concerning ecological recovery.

THE ACTUAL REGIME CONCERNING THE POLLUTION OF THE RIVER RHINE

During more than 40 years of intergovernmental negotiations many institutional, cognitive and political barriers have disappeared. International negotiations resulted in a dynamic, steadily growing regime. The actual Rhine regime is generally considered a sophisticated regime as it is well-defined, specific and ambitious.

Interaction was structured. Consultation on the pollution of the river at the international level began as discussions among a small group of experts. Now it involves an inter-governmental organization with a large number of working

groups and regular ministerial meetings.

The riparian states also coordinated their permit policies toward discharging industries. Two steering strategies were incorporated in the regime. The Rhine Chemicals Treaty was elaborated in protocols dealing with separate chemical substances and industry specific standards. In sum, over the period 1979-1990, the IRC made recommendations with concrete emission norms for ten materials from the 'black' list—mercury, cadmium, aldrin, dieldrin, endrin, carbon tetrachloride, chloroform, endosulfan, hexachlorobenzene, and hexachlorobutadiene. Emission norms were also proposed for chromium, which appears on the 'grey' list. In regard to the other recommendations, an appeal was made to prevent further increases in pollution, to enforce a strict policy, to deal with diffuse sources of pollution, and to monitor certain materials closely. The Rhine Action Programme (RAP) harmonized the targets of the policies of the riparian states. As a part of the RAP, the annual load for fifty materials was specified for each country along the Rhine, apportioned to the industrial sectors discharging these substances. The harmonization of emission norms was achieved, along with an agenda for reducing emission levels of identified pollutants.

Beside this, internationally financed measures were taken concerning chlorides pollution, both in France and in the Netherlands. It was agreed that salt would be temporarily stored in the Alsace if the chloride concentration at Lobith rose above 200 mg/l for a period of more than 24 hours. After the 31st December, 1998, the date when the potassium mines were expected to close, the stored salt would gradually be discharged into the Rhine. Further, the salt water that percolates into one of the Dutch wells for drinking water would be piped to the Wadden Sea. With this policy mix, the salt issue was deleted from the IRC agenda.

Since 1987, ecological recovery of the catchment has been the major issue for the riparian states. A more holistic and ecological way of looking at water quality is focused on an inspiring ideal. The return of previously indigenous species like the salmon is the target of the RAP. By the year 2000, salmon must be restored to the Rhine catchment area. This implies that the program's definition of the problem is wider in scope than that of the Rhine Chemicals Treaty. The latter concentrated on the gradual clean-up of structural point sources of pollution. The RAP, however, aims at rapidly reducing structural pollution from point sources as well as diffuse sources. Within the context of the RAP, the IRC also formulated measures to reduce the chance of accidents and improve the hydrology and morphology of the Rhine. For instance, riparian states must help migrating fish bypass the dams more easily by building fish ladders, and spawning areas must be laid out upstream. The program also draws attention to the contamination of the river bed.

If we evaluate the progress of the regime based on Young's criterion (i.e., the degree of goal attainment, implementation of the regime and the behavior of discharging industries) (Young 1994), the results have been positive. Concentrations of organic pollution, chlorides, micro pollutants, and nutrients have declined. Radical reductions of heavy metals have been achieved. Also the effort to restore the indigenous salmon to the Rhine is hopeful (Van Wijk 1992, pp. 24-26, Perdok 1992, p.44). Upstream spawning grounds have been restored as some salmon have reportedly returned from the sea to these spawning grounds. National laws and permit policies conform to international agreements and discharging industries have invested in treatment facilities.

Compared to other regimes for transboundary rivers in Western-Europe, the Rhine regime is a sophisticated regime. The success of the development of the Rhine regime has been recognized internationally. It therefore came as no surprise that other international bodies are inspired by the Rhine approach. The Treaty of Helsinki calls for establishing IRC-type structures in other European catchment areas (Nollkaemper 1993, p. 16) and the European Commission considers catchment specific action programs the most promising approach (Commission of the European Communities 1996). Catchment organizations have been set up now for other transboundary rivers like the Meuse and the Scheldt as well.

By 1995, the issue of Rhine pollution had largely been brought under control. Further, discussions on the international level concerning further improvement of the quality of the catchment have continued. The IRC has taken up new problems, like the reduction of diffuse sources of pollution and the relation between ecological recovery and water quantity issues, which demonstrates continued commitment to the ecology of the Rhine catchment area.

THE ROLE OF THE NONGOVERNMENTAL ORGANIZATIONS

In addition to senior officials, politicians and political parties, NGOs were involved in the development of the Rhine catchment area regime. The Dutch waterworks (a quasi nongovernmental organization) and the Dutch environmental movement were especially instrumental in helping to resolve institutional, cognitive and political barriers to regime development.

The initiatives of the Dutch government to set up an informal consultative body and to stimulate ministerial involvement resulted from appeals made by Dutch waterworks. Deteriorating water quality prompted the Rijncommissie Waterleidingbedrijven (RIWA)—the organization representing the interests of those Dutch drinking-water companies that were dependent on Rhine water—to contact the Dutch government with proposals for action. To improve contacts with other governments the RIWA joined forces with fellow organizations in the Rhine catchment area. Through the Internationale Arbeitergemeinschaft der Wasserwerke im Rheineinzugsgebiet (IAWR), attempts have subsequently been made to sway the governments of the other riparian states. In its Rhine Memorandums the IAWR proposed extensive packages of demands to the governments of the riparian states along the Rhine. Beside this, waterworks were also able to influence policies because of the fact that representatives of the drinking-water companies held administrative and political jobs.

Waterworks and the environmental movement were involved in fact-finding activities which influenced perceptions in the catchment area. Waterworks provided the states with data concerning the pollution of their sources. Environmental organizations like the Dutch Stichting Reinwater (Clean Water Foundation) and Greenpeace started monitoring campaigns on the river to clearly identify specific point sources of pollution. Both succeeded in influencing perceptions concerning the Rhine quality. The publication of a report by the German Sachverständigenrat für Umweltfragen, in which the German contribution to Rhine pollution was explained, also raised the awareness of the issue in the German part of the catchment area.

Some political barriers to further regime elaboration could also be resolved as a result of NGO- initiatives. The environmental movement ensured that upstream governments and industry were kept under continual pressure, for instance, through legal proceedings against polluters. The legal proceedings Reinwater started, together with some market gardeners, against the French potassium mines were very successful. After 14 years of proceedings an out-of-court settlement was achieved between the gardeners and the mines. The MDPA would pay Dfl. 3.75 million as compensation and in exchange, market gardeners would abstain from further legal action. During the proceedings some important decisions were taken. The Court of Justice of the European Community, in accordance with the 1968 EC Convention on Jurisdiction and Enforcement of Judgements in Civil and Commercial Matters, found that courts at both the site of damage and at the origin of damage had jurisdiction. Further, the District Court found that the discharge of waste salts was unlawful and that the MDPA had to pay for that part of the damage which corresponded to the contribution of the MDPA to the salinity of the water used by the plaintiffs. These successes at court inspired Dutch drinking-water companies and other victims of pollution problems to start other successful proceedings in France in administrative and criminal courts.

Beside this, the successes offered the Dutch government the opportunity to change its strategy in international negotiations. The Dutch refused to accept French proposals for a temporary reduction of the chlorides discharges. This stance was partly due to the fact that the parties bearing the brunt of the chloride discharges—horticulturists and drinking-water companies—seemed likely to get compensation for damages. In addition, technical developments made horticulturists less dependent on Rhine water. So the Dutch government preferred to spend the money on the elaboration of the RAP. However, pressure from the drinking-water companies forced the Dutch government to revise its standpoint. If the French proposals were not to be carried out, the danger existed that provincial waterworks would be unable to use a water-softening installation that was under construction. In making this investment, it had been assumed that softening Rhine water by exchanging calcium ions for natrium ions would be possible without overstepping the norms for natrium in drinking water. However, if the reductions were not implemented, there would be no decrease in the chloride and natrium content of Rhine water, and the natrium content of the drinking water might exceed the legal maximum. The idea to bring the chlorides problem to an end by a package deal of measures both in France and in the Netherlands was introduced by the Noord-Holland waterworks. The drinking-water interests of the province of Noord-Holland could eventually be accommodated by introducing a policy mix costing significantly less than the original French proposal.

NGO policies also had an impact on the issue of chemical pollution. Publicity campaigns influenced environmental awareness of industries, governments and mobilized public opinion in the catchment area. Through buying shares in polluting companies, the Dutch Stichting Reinwater tried to influence the decision-making of these companies. Major polluters of the Rhine were confronted with the results of monitoring campaigns in the so-called water tribunal, a non-official court by which they were condemned. Reinwater also published its arguments in newspapers, did grassroots work by educating kids at schools and had contacts with ministers and political parties. These activities resulted in a growing willingness to adapt discharges to environmental standards. Industries intensified treatment of their waste waters. In response to these efforts concentrations of heavy metals on the Dutch border decreased and an international agreement on specific standards could easily be reached, for—generally speaking—it was in line with technological improvements (whereby emissions had already decreased) that had resulted from NGO grassroots strategies.

Finally, negotiations concerning ecological recovery of the catchment were also influenced by NGO activities. The successes in the civil proceedings of Reinwater improved the position of the Dutch government in the negotiations with Germany. The Dutch delegation threatened to support the municipality of Rotterdam, which wanted to start proceedings as well. Rotterdam Harbour was polluted with contaminated sludge and upstream discharging industries were held responsible for the costs Rotterdam had to bear for a correct removal and storage of this sludge. This made the Germans more eager to accept the Dutch proposals.

So, a mix of strategies made NGOs successful actors in the Rhine catchment area (Van Noort 1987). They persuaded other actors, provided them with information concerning discharges, started legal proceedings and captured mass media attention.

CONDITIONS FOR SUCCESSFUL NGO PARTICIPATION

NGOs could only be successful actors because the conditions in the Rhine catchment area were favorable. Characteristics of the political and legal system, characteristics of NGOs and industries and finally the characteristics of the problems contributed to the positive results of NGO intervention.

The openness of the political system in the Rhine catchment area made governments receptive to the ideas of the NGOs. An open dialogue exists between NGOs and the governments. In the Netherlands this openness is probably the most far-reaching with Dutch governments supporting their own opposition. Environmental organizations like the Stichting Reinwater are partly funded by the government (Van Leeuwen 1992). Public involvement is also stimulated by the French government, which started a foster parents plan for salmon. Recently, NGOs obtained an observer status at the IRC. Beside this, the national political systems are integrated. Apart from the contacts within the IRC, many other contacts between the riparian states exist on political, business and cultural levels. Feelings of deep animosity do not occur.

The NGOs could only be successful because of their high levels of professionalism and internationalism. Both the waterworks and the environmental movement employed professionals. The waterworks have their own laboratories and the environmental movement had the possibility to start monitoring campaigns and succeeded in identifying point sources of pollution. At the international level, networking resulted in international agencies representing the waterworks, the IAWR, and the environmental movement, the Internationale Rijngroep.

Another factor explaining the successes is the fact that enterprises in the catchment area expressed a growing environmental awareness and had the financial resources to invest in more environmentally sound technologies.

Finally, the characteristics of the perceived problems allowed for progressive regime development. Disasters like the accidental discharges of the pesticide endosulphane and the accident at Sandoz, where large amounts of chemicals entered the water, raised public awareness of the risks of industrialization in the catchment area. However, these problems also had some friendly characteristics as technological possibilities to solve the problem (end of pipe technology, process integrated technology) became available and could be integrated without disturbing industrial processes.

CONCLUSION

In cases of asymmetrical pollution, it will often be difficult to reach a solution that is satisfactory to all parties involved. Regime development, in which there is invariably an asymmetrical environmental load, is difficult to achieve. The results are largely dependent on the initiatives taken by the downstream countries. This article showed that both governments and NGOs can contribute to a progressive and successful regime development. The combined efforts of governments and NGOs resulted in the gradual development of the regime and the improvement of environmental conditions in the catchment area. In the future, as diffuse sources of pollution form a growing part of the Rhine pollution issue, however, consultation at higher levels will become more important. In the context of the European Union, regulations for pesticide use must be introduced, and pollution originating from European-wide atmospheric deposition must be put on the other European agendas.

If we examine the strategies adopted by the downstream Dutch government, it becomes apparent that open conflict was generally avoided. Within the context of the IRC, the Dutch government was persistent in its attempts to work with the country's upstream neighbors. Political maneuvers and the submission of memorandums and other policy proposals were the most important strategies used by the Dutch to overcome barriers. In this way it was possible to create a formal consultative body with several working groups and to convene ministerial conferences. This made it

easier to continue negotiations and to resolve cognitive and political barriers.

As in the Dutch case, the downstream governments of the developing Mekong area will have to take the initiative in building a workable regime with their neighbors.

Now is the time for Thailand to plan ahead and begin to build a workable regime with her neighbors. Within the Mekong River Commission, brainstorming sessions could be started.

In the Rhine case, NGOs like the waterworks lobby and the environmental movement put pressure on both governments and industries, both on a national and an international level. Most importantly, the initiation of judicial proceedings against the potassium mines was the result of NGO actions and these proceedings had a positive effect on the willingness of the parties involved to take steps, not only in this case, but also in other cases. The ability of NGO activities to result in changes in perceptions and behavior rested on the openness of the political and legal systems, the high degree of professionalism, and the willingness of business to respond to pressure as NGOs became shareholders. The Rhine case emphasizes that NGO policies will only be effective if the conditions for an open dialogue are met, thus the importance of openness in water quality decision-making is stressed.

It is the combined effort of governments and NGOs that can contribute to more sustainable watersystems.

REFERENCES

Clarenburg, L.A. 1990. *Een schakel der onafzienbare keten...., Een beschouwing over samenhangen in de problematiek van de grensoverschrijdende milieuverontreinigingen.* Utrecht: Inauguratierede Milieukunde.

Commission of the European Communities. 1996. *European Community Water Policy, Communication from the Commission to the Council and the European Parliament*, Brussels, 21-2-196, COM (96) 59 final.

Dieperink, C. 1995. "Between Salt and Salmon, Network Management in the Rhine Catchment Area." In *Managing Environmental Disputes*, P. Glasbergen (ed.). Kluwer.

Dogterom, J. 1992. *De waterkwaliteit in de grote rivieren en randzeeën van Europa*, Amsterdam, 17 Januari 1992, Rede uitgesproken bij de aanvaarding van het ambt van bijzonder hoogleraar in de milieuchemie aan de Vrije Universiteit te Amsterdam.

Gleick, P. 1993. *Water in Crisis, A Guide to the World's Fresh Water Resources*. New York: Oxford University Press.

Huisman, P. 1990. Human Interference in the Rhine Basin. Paper presented at the Workshop Rhine-Danube, Delft, 9-11 October.

Internationale Kommission zum Schutze des Rheins. 1994. *Aktionsprogramm Rhein, Bestandsaufnahme der punktuellen Einleitungen prioritärer Stoffe 1992.* Koblenz.

Internationale Kommission zum Schutze des Rheins. 1994. *Zahlentafeln*, Koblenz.

Internationale Kommission zum Schutze des Rheins gegen Verunreinigung. 1965. *Tätigkeitsbericht.* Koblenz.

Jansen J.H., and R.H. Dekker. 1984. "Vertaling van EG-richtlijnen in internationale verdragen." Pp. 213-218, in H_2O.

Krasner, S.D. 1984. "Structural Causes and Regime Consequences: Regimes as Intervening Variables." Pp. 1-22, in *International Regimes*, S.D. Krasner (ed.). Ithaca: Cornell University Press.

Krul, W. 1952. *Voorgeschiedenis nationaal en internationaal overleg inzake de Rijn*, 's-Gravenhage, 17 April 1952, Brief no. 143/24 van het Rijksinstituut voor Drinkwatervoorziening aan de leden van de Rijncommissie.

Leeuwen, R. van. 1992. *De actieradius van Both Ends in het Noorden.* Amsterdam: Both Ends.

List, M., and V. Rittberger. 1992. "Regime Theory and International Environmental Management." Pp. 85-109 in *The International Politics of the Environment*, A. Hurrell and B. Kingsbury. Oxford.

Nollkaemper, P.A. 1993. *The Legal Regime for Transboundary Water Pollution: Between Discretion and Constraint.* Dordrecht: Martinus Nijhoff Publishers.

Noort, W.J. van. 1987. "Actievoeren: strategieën en tactieken." In *Protest en pressie, Een systematische analyse van collectieve actie,* W.J. van Noort e.a. Assen: Van Gorcum.

Perdok, P. 1992. *Schone Rijn of schone schijn?* Scriptie Landbouwuniversiteit Wageningen.

Saetevik, S. 1988. *Environmental Cooperation between the North Sea States, Success or Failure?* London: Bellhaven Press.

Schwabach, A. 1989. "The Sandoz Spill: the Failure of International Law to Protect the Rhine from Pollution." *Ecology Law Quarterly* 16: 443-480.

Shiklomanov, I.A. 1993. "World Fresh Water Resources." Pp. 13-24, in *Water in Crisis, A guide to the World's Fresh Water Resources*, P. Gleick (ed.). New York: Oxford University Press.

Wettestad, J. 1988. "The Outcome of the 1987 North Sea Conference: Science Counts, but Politics Decides?" *International Challenges* 8 (2): 31-35.

Wijk, W. van. 1992. "Het Rijnactieprogramma levert nog wel zalmen op." *ROM-bulletin* 11: 24-26

Young, O.R. 1989. "International Regimes: An Institutional Perspective." Pp. 11-30, in *International Cooperation, Building Regimes for Natural Resources and the Environment*, O.R. Young. Ithaca: Cornell University Press.

Young, O.R. 1994. "The Effectiveness of International Governance Systems." Pp. 140-160, in *International Governance, Protecting the Environment in a Stateless Society*, O.R. Young. Ithaca: Cornell University Press.