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States and Common Pool Resources

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Introduction

In the neo-institutionalist literature it is argued that the collective action problems involved in managing common pool resources can be successfully handled by voluntary agreements (Ostrom 1990; Keohane & Ostrom 1994). We wish to state our reservations to this argument in relation to states as players with the tragedy of the Baltic Sea as a concrete example. The neo-institutionalist approach claims that states overcome the so-called tragedy of the commons by creating and implementing an international regime preventing the rational overexploitation, depletion and possibly destruction of the pool resources (Young 1982, 1989).

The neo-institutionalist theory about states and the management of common pool resources entails that the voluntary introduction and enforcement of institutions resolves the problem of dissipation of rents. The theory is based upon a few assumptions about state actors and their preferences that need to be examined at length (Wildavsky 1987). If alternative assumptions about states and state preferences are chosen, then the prediction about the possibility of resolving the collective actions problems involved will be entirely different. States can overcome the failure of collective action by finding and implementing an institutional regime that counteracts the free rider problem in the management of common-pool resources only under special conditions.

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Below we examine the theoretical assumptions of the neo-institutionalist model of common-pool management in relation to the interaction between

states as well as enquiring into an empirical case in order to highlight which alternative set of assumptions about state players is more plausible for the real world. First, we look briefly at the case, i.e. predicament of the Baltic Sea.

The Common Pool of the Baltic Sea

The Baltic Sea, a semi-closed area of about 415,000 km^2, is the largest body of brackish (low salinity) water in the world and is distinguished by its division into a series of basins of varying depths. Traditionally, there has been much fishing in various parts. Its ecologic importance is without doubt immense for the nine countries that share its coastline, harbouring some 80 million people. In addition, the catchment area of the Baltic Sea is much larger, as some of the rivers of Belorussia, the Ukraine and the Czech and Slovak Republics end in the Baltic Sea. The major rivers that are connected with the Baltic Sea include: the Neva (Russia), the Vistula (Poland), the Kemi and Kymi (Finland), the Daugava (Belorussia, Latvia), the Neman (Ukraine, Belorussia, Lithuania, Russia) and the Oder (Czech Republic, Poland, Germany). These seven rivers deliver about half of all the fresh water that runs into the Baltic Sea. In addition, there are some 37 other rivers that flow into the Baltic Sea. These rivers flow through a land area four times the size of the Baltic Sea itself. In combination with the stagnation of the deeper water, the pollution of the Baltic Sea may now be described as a threat to its living resources (Helsinki Commission 1992, 5/3).

The parts of the Sea affected by pollution have increased, particularly along the coasts of the industrialized countries. Moreover, the types of pollutant have changed considerably, as industrial and agricultural wastes came to contain more toxic substances. Most coastal areas are now as seriously affected as some heavily polluted inland waters. The various airborne pollutants creating background contamination in most of the oceans of the world have seriously affected the Baltic Sea (Hanson & Rudstam 1990; Hjorth 1991, 1992).

The main threats to the Baltic Sea are the high concentrations of nutrients, the decline of oxygen, the bad inflow of fresh salinity water from the North Sea and the emission of harmful substances to the sea. The marine environment has changed dramatically during recent decades, and at the end of the 1980s the extent of the bottom area which was defined as "biologically dead" was as great as 100,000 km^2. Pollution from land transported by the rivers is greater than the atmospheric input. Thus, for 1987 the input in tons from land included: degradable organic matter (BOD equivalent) 1,640,000, phosphorus 48,500, nitrogen 530,000, cadmium 59, copper 4,200 and zinc 8,900. The atmospheric input in 1986 included:

Table 1. Total P Loads into the Baltic Sea in 1990 (Ton/Year).

Subarea	Rivers	Urban Areas	Industries	Total
Bothnian Bay	2,134	49	162	2,345
Bothnian Sea	1,851	56	356	2,263
Archipelago Sea	664	31	140	835
Gulf of Finland	7,642	4,078	70	11,790
Gulf of Riga	2,705	649	34	3,389
Baltic Proper	14,158	2,902	747	17,807
Belt Sea and Western Bays	1,699	964	124	2,787
Sound	234	1,559	100	1,882
Kattegat	1,281	328	118	1,727
Total	32,358	10,616	1,851	44,824

Source: HELCOM (1993, 6).

nitrogen 270,000–630,000, cadmium 35, copper 470, lead 1,560 and zinc 3,400 tons (HELCOM 1990,8).

The main negative changes in the marine environment concern trends toward increasing nutrient concentrations which cause a higher biological productivity. The organic material produced in this process consumes oxygen during its microbial destruction, thus contributing to the more frequent oxygen depletion and occurrence and spread of hydrogen sulphide in the bottom water layer of the Baltic Proper, the Belt Sea and Kattegat under stagnant conditions (Table 1).

In the 1980s, the concentration of nutrients was stabilized at a high level (Table 2). The situation for the concentration of nutrients in the southeastern Gotland Sea is more or less the same as the overall trend for the Baltic Sea.

Untreated waste waters from industry, both municipal and agricultural, are responsible for the high concentrations of nutrients in the Baltic Sea. The

Table 2. Total N Loads into the Baltic Sea in 1990 (Ton/Year).

Subarea	Rivers	Urban Areas	Industries	Total
Bothnian Bay	35,034	1,630	1,567	38,231
Bothnian Sea	42,985	1,399	3,097	47,481
Archipelago Sea	7,870	940	1,101	9,911
Gulf of Finland	109,530	30,045	868	140,443
Gulf of Riga	11,730	5,061	281	17,072
Baltic Proper	159,176	24,660	2,463	186,299
Belt Sea and Western Bays	38,821	7,072	1,583	47,476
Sound	7,591	6,815	311	14,717
Kattegat	41,340	4,374	852	46,565
Total	454,077	81,994	12,122	548,195

Source: HELCOM (1993, 6).

Table 3. BOD7 (Organic Matters) Load into the Baltic Sea in 1990 (Ton/Year).

Subarea	Rivers	Urban Areas	Industries	Total
Bothnian Bay	79,793	2,731	18,457	100,981
Bothnian Sea	88,536	1,055	58,298	147,889
Archipelago Sea	7,780	742	202	8,274
Gulf of Finland	201,935	70,027	14,324	286,286
Gulf of Riga	101,807	38,923	863	141,593
Baltic Proper	529,862	60,003	19,336	609,201
Belt Sea and Western Bays	4,528	20,804	24,142	49,475
Sound	489	8,148	8,022	16,658
Kattegat	8,227	4,843	10,935	24.005
Total	1,002,957	207,276	154,578	1,384,811

Source: HELCOM (1993, 6).

problems with untreated waste water are of major dimensions in the eastern Baltic area, where very often there is no treatment equipment whatsoever. In the region of St Petersburg, for example, the untreated sewage from more than two million inhabitants flows into the Gulf of Finland. In addition to direct outflow of nutrients into the Baltic, airborne pollution is responsible for 50 percent of the nitrogen load in the Baltic Sea.

The depletion of oxygen, as an effect of the nutrient concentrations, has seriously affected all living resources in the sea. The decreasing level of oxygen is significant in the deep waters, the reason being mainly the lack of inflow of fresh water from the North Sea and the Skagerrak. Hydrogen sulphide is destructive for the ecological system of the sea and the main reason why more than 100,000 km^2 of the bottom of the Baltic Sea had in the late 1980s been declared biologically dead.

Table 3 contains information about the total load of organic materials into the Baltic Sea. The figures are high enough to warrant the question: Is the ecological system of the Baltic Sea out of balance, and to what extent is this imbalance a result of state activities or lack of state activity?

The marine environment of the Baltic Sea has been monitored by the Helsinki Commission (HELCOM). Since 1979 the Commission has been collecting data within the frame of the Baltic Monitoring Programme (BMP). The monitoring data provided by all Baltic Sea States are stored and processed in the HELCOM Database, established by the Commission on a consultant basis. What else has this international regime accomplished?

The International Regime

The first steps towards creating some kind of international regime for the handling of the environmental protection of the Baltic Sea were taken in the

early 1970s. Finland initiated the negotiations between the so-called coastal states of the Baltic Sea in 1972 that were held after the United Nation's environmental conference in Stockholm the same year. The goal was to arrive at a coordinated effort to counteract the rising pollution and depletion of the Baltic Sea.

In 1974 all the Baltic states signed the so-called Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea Area, where Article 3 states that all states will "prevent and reduce the release of polluting materials and protect and improve the marine environment of the Baltic Sea Area" (Fitzmaurice 1992, 233). This regime went into operation in 1980, and a coordinating body was created, HELCOM (The Baltic Marine Environment Protection Commission), in order to collect information about the environmental predicament of the Baltic Sea and function as an administrative body coordinating the environmental collaboration between these states.

Further concrete steps have been recommended in two declarations from 1988 and 1990 at the ministerial level. In 1992 the 1974 international regime was replaced by a new one, also signed by such states in the periphery of the Baltic Sea as Norway, the Ukraine, Czechoslovakia and the EC Commission. In "The Baltic Sea Environment Declaration" the multilateral financing of programmes to reduce the amount of pollution entering the Baltic Sea was outlined as a method with which to make a start on improving the environmental condition of the Sea. However, even though the plans of the 1990s are much more substantive than the 1974 agreement, it is questionable whether the situation has improved (Fitzmaurice 1992; Hjorth 1992).

Yet, more concrete steps were planned at the Rönneby Conference in 1990. At the ministerial level it was decided that the Helsinki Commission should start working on further concrete steps designed to save the marine environment of the Baltic Sea. This marked the beginning of a process which led to "The Baltic Sea Joint Comprehensive Environmental Action Programme". The political changes in the post-Communist countries made it possible for the Commission to recommend concrete action for cleaning up the polluting industry of every country in the region. In the philosophy of "cost efficient abatements", the work of the Commission ended up in an action plan, which was signed in April 1992. In addition to the coastal states in the Baltic Area, Norway, the Czech and Slovak Federal Republics, the Ukraine and the European Economic Community signed "The Baltic Sea Joint Comprehensive Environmental Action Programme". The Action Programme consists of 132 "hot spots", which are the most critical sources of pollution to the Baltic Sea. The implementation of the programme by the year 2012 carries a price tag of some 18,000 million European Currency Units (ECU).

The main question today is who is going to pay the bill. There has been no agreement on this between the Baltic States. The Commission has suggested a plan for financing the Action Programme, in which financial institutions such as the European Bank for Reconstruction and Development (ERBD), the European Investment Bank (EIB), the Nordic Investment Bank and the World Bank play a major role. The situation in the post-Communist countries is in many ways critical, and there is disagreement between them and the Western countries about who should pay the abatements of the Eastern countries. Some kind of agreement has to be reached on the financial aspect, otherwise very little will be done about the 105 (out of a total of 132) "hot spots" which are located in the post-Communist countries.

Why, then, has so little been accomplished in protecting the Baltic Sea as a common pool of many states? The international regime is in place, but it is inefficient. It is now time to examine the neo-institutionalist model, especially its assumptions about state behaviour in relation to collective action problems. In the neo-institutionalist theory of common-pool goods the role of the state is based on three assumptions.

Institutional Teleology

First, the state will come into the theatre ex post. The state takes action in relation to so-called market failures within its own territory, either by employing state legislation counteracting externalities in the employment of common-pool resources or by placing such resources in the public domain. The state preserves the resources of *terra nullius* by negotiating international regimes that regulate the use of common-pool resources outside its territory (Young 1989).

Second, when the tragedy of the commons is modelled on the basis of the Prisoners' Dilemma expressing the logic of over-utilization of common-pool resources (Hardin 1968, 1982), then implicitly there is the assumption of symmetry. This means that all the state players involved can and will operate as a rational actor maximizing the public interest, provided they can overcome the collective action difficulties. But do all states face the same set of feasible strategies in relation to the management of common-pool resources?

Third, there is a basic teleological assumption about state behaviour in the sense that the states wish to implement desirable solutions to the problem of managing common-pool resources. This is not an innocuous one, because it is in its turn based on assumptions about the preferences schedules of the leaders in the state that may not be universally true. Why would the state always act functionally in relation to common-pool resources? What are the implications of the alternative assumption about opportunistic behaviour

between asymmetrical state players, "opportunism" meaning guileful self-interest seeking (Williamson 1986)?

Any functionalist theory of state activities in relation to the common pool bypasses the *ex ante* role of the state as well as the occurrence of asymmetrical interaction between, for example, rich and poor states. What will the outcome be, if one assumes instead asymmetric relationships between states involved in ecology reciprocities where some of these states also played a major role *ex ante* in the search for an international regime that could handle the management of common-pool resources. What if the state is not part of the solution to the tragedy of the commons but instead part of the problem?

Theoretically, the tragedy of the commons problem like, for instance, that of the Baltic Sea is modelled as a Prisoners' Dilemma game. Whereas the classical statements about the difficulties in arriving at first-best solutions in relation to common-pool resources were pessimistic (Hardin & Baden 1977), the new institutionalism has brought an optimistic tone into the debate (Ostrom 1992a). It is claimed that the collective action difficulties in protecting common-pool resources may be overcome by the establishment by means of voluntary exchange mechanisms of institutional principles that guard against the depletion or destruction of the common pool (Ostrom 1992b). However, such a claim is based upon assumptions about the set of feasible and desirable state strategies which may not hold in reality.

The model of the Prisoners' Dilemma for the analysis of the tragedy of the commons starts from the assumption that symmetrical states confronting collective action problems may develop meta-strategies in order to reach coordination landing on the cooperative strategy. As long as there is a likelihood that the interaction between the participants will be reiterated, the reciprocal choice of a tit-for-tat strategy will result in the choice of the Pareto-optimal solution, i.e. cooperation for environment protection (Axelrod 1984). Slowly, the common-pool resources problem will become manageable by means of a voluntary exchange mechanism, leading to agreements that are self-enforceable among the participant actors (Ostrom et al. 1993), if tit-for-tat really works as participants grow in number.

States employ a special institution to make the collective action problem of common-pool resources manageable, viz. the identification and implementation of a so-called international regime. International regimes offer "social institutions governing the members of the international society" (Young 1989, 6). If such an international regime is extensive, comprises a number of rules, and is backed by organizational resources, then it could constrain its members towards first-best solutions (Krasner 1982).

International negotiations leading to institutional regime choice would thus be instrumental in overcoming the collective action difficulties in protecting common-pool resources. In general, neo-institutionalism predicts

that institutions will be forthcoming when rational actors choose between alternative institutional frameworks which enhance equilibrium outcomes – so-called equilibrium institutions (Sheplse 1986, 1989). Or putting it more strongly, in the Coase tradition, small groups will establish institutions or rules that guarantee optimal outcomes, as long as transaction costs are not staggering (Coase 1988).

Yet, the neo-institutionalist analysis of the selection of institutions is driven by an implicit functionalist notion of the state that is not warranted. The crux of the matter is that the real preferences and behaviour of some states may not fit with the presuppositions of the Prisoners' Dilemma model of the tragedy of the commons. The neo-institutionalist argument involves two steps:

(1) The management of common-pool resources involves collective action problems. Assuming individual rationality, will protecting the commons as a public good be forthcoming on the basis of voluntary exchange only? No single actor has the incentive to allocate this public goods because of the N-1 and 1/N problems. As long as a group of size N members protects the commons by not using the commons, the N-1 actor would always benefit from exploiting the commons. If one actor allocates the public goods, i.e. does not exploit the commons, then s/he could at best only hope for 1/N share of the benefits from her/his contribution.

The existence of N-1 and 1/N collective action problems in relation to the allocation of a good implies that that there will an undersupply of the good (Olsen 1965). However, if the preferences of the actors have a specific shape and there is reiterative interaction, then institutional solutions could be introduced. Modelling the common-pool resources problem as a Prisoners' Dilemma implies precisely such a choice opportunity for the participants to introduce rules that enhance the arrival at and implementation of first-best solutions, e.g. mechanism design (Rasmussen 1994).

(2) Despite the pessimistic tone in the tragedy of the commons literature, there is hope in relation to the tragedy of the commons when it is modelled as a Prisoners' Dilemma predicament. The dominant strategy in terms of individual rationality results in destroying the commons which would be the irrational or Pareto-inefficient solution. There is a first-best solution – cooperation, cooperation – that could be forthcoming by the establishment of a proper institutional mechanism enforcing the Pareto-optimal solution. State players could offer an institutional mechanism for the prevention of the tragedy of the commons. Whether the state will take such action to attempt to protect the common-pool resources around its borders depends, though, on both its capacity to act (feasibility) and its preferences when international regimes are to be set up (desirability).

Yet, there may exist no first-best solution to the management of the common-pool resources when states interact as sovereign actors in dealing with the tragedy of the commons. The Prisoners' Dilemma picture of the collective action problem in relation to common pool resources is not overly pessimistic but too optimistic. The Prisoners' Dilemma models the repetitive interaction between states over common-pool resources as having a Pareto-sanctioned solution that is socially acceptable. A number of reasons may be adduced to the effect that this is not the correct interpretation, i.e. step (2) in the argument is wrong.

State Actors: Capacity and Interests

First, a state may not be able to cooperate in the management of the common-pool resources, as it may simply lack the resources necessary to take action to protect the commons. If first-best solutions are not achievable, then the tragedy of the commons is unavoidable. Second, a state may not wish to cooperate in the management of common-pool resources. The Prisoners' Dilemma game builds upon the following symmetric preferences with regard to the two fundamental alternatives of action: cooperation vs. defection from among two interacting states, A and B:

(1) A's preferences: Defection by A and cooperation by B, cooperation by A and cooperation by B, defection by A and defection by B, cooperation by A and defection by B.
(2) B's preferences: Defection by B and cooperation by A, cooperation by A and cooperation by B, defection by A and defection by B, cooperation by B and defection by A.

The paradox of the Prisoners' Dilemma arises from the preference profiles. If both states unilaterally seek their first option, then they will end up in their third option, which is not Pareto-optimal. But the tragedy of the commons may result from a more cruel preference profile. Suppose that state B lacks both the capacity and the will to take the cooperation option. Then, there will only exist two outcomes: defection by B with cooperation by state A, or defection by B with defection of also state A.

Actually, the Prisoners' Dilemma is much too optimistic a model. Take the case of the tragedy of the Baltic Sea. The former Communist states will not for a long time be capable of nor wish to cooperate by undertaking large-scale and costly measures in order to protect the Baltic Sea. Thus, the predicament is not that of the Prisoners' Dilemma, i.e. the preference profile: (P1) DC, CC, DD, CD, but that of the deadlock game, i.e. preference profile: (P2) CD, DD, CC, DC. The Prisoners' Dilemma model implies symmetry between the players. However, whether this assumption applies or not is an

empirical question. The tragedy of the commons may result even when there is a symmetrical predicament between actors, but it is bound to be the outcome from an asymmetrical predicament among state players.

The first and most conspicuous aspect of certain common-pool problems is that the players at the state level take action from different circumstances and with different preferences. This is not to deny that frequently the management of common-pool resources involves the kind of paradox modelled in the Prisoners' Dilemma game or the Chicken game (DC, CC, CD, DD). But this is not necessarily so. The management of common-pool resources may involve collective action problems at the same time as the players look upon the situation differently and defend asymmetric interests.

States that take part in the creation of an international regime may make very different deliberations about what the pros and cons of alternative schemes are. With regard to ecology and environmental issues, groups within the same state may differ considerably on how they estimate risk, hazard and opportunity, not to say costs (Wildavsky 1988). The variety of orientations among states to the outcomes of the tragedy of the commons will reflect such countries' opinions, particularly among those people who have a decisive influence on policy-making in the field of ecology. There may exist wide distances between state standpoints corresponding to the gulf between internal groups in terms of environmental assessment and demand for action. Policy-making in relation to common-pool protection is a function of two factors:

(1) Feasibility: Are there options that the state may realistically pursue that have a probable impact upon the amelioration of the tragedy of the commons? The information function reflects the technology available in society.
(2) Desirability: Are some of the feasible programmes worth undertaking? The evaluation of the expected value of alternative policies reflects not only the objective costs involved in each programme but also the subjective marginal willingness to pay.

States differ considerably on both (1) and (2). The boundaries of the set of feasible policies are drawn by, on the one hand, the access to advanced information, and on the other hand by the possession of economic resources to be employed at the implementation stage. The set of desirable policies may be either large or small depending upon the values at stake. Finally, the joint set of feasible and desirable policies may as a matter of fact be empty, because the desirable programmes are not feasible or the feasible policies are not considered worth their costs. Policy feasibility being determined by available technological knowledge and policy desirability expressing the variety of preferences among leaders, it is small wonder that there will be

sharp differences both between states and over time in the capacity and willingness of states to take part in international regimes.

It may be predicted that the level of affluence matters a great deal in the capacity and willingness of states to act in relation to the tragedy of the commons. The joint set of feasible and desirable policies with regard to common-pool resources increases with the rise in living standards. The implication must be that collective action problems involving rich and poor states result in asymmetric relationships.

Protecting the Baltic Sea is a concern for a few rich countries – the Nordic states and Germany – and some poor countries – the post-Communist states. But they are very differently concerned about the tragedy of the Baltic Sea. It is not the case that any of the coastal states are less affected by the slow destruction of the common pool, but the basic situation involves asymmetry between the joint set of feasible and desirable environmental policies of these states.

The Exploitation of the Rich by the Poor

The reciprocities between the rich and poor states in this part of the world are formidable, because the rich states cannot exclude themselves from the pollution of and depletion by the poor countries. Non-excludability is combined with subtractability, because when the poor countries use the common-pool resources in various ways, they also decrease the size of the pool also the rich countries. Thus, the losses for the rich countries from the predicament of non-excludability and subtractability may be enormous.

At the same time the poor states have all the advantages of free riding upon the efforts of the rich states to decrease their consumption of the pool. Since it is impossible to internalize the benefits of public goods to the group that allocates it, the poor countries will get something for nothing. Allocating environmental protection, the rich states cannot exclude the poor from benefiting even if they contribute nothing. If a rich state considers saving the Baltic Sea as having the highest priority, then it may accept that it can only reap 1/n of the benefits from its contribution.

The collective action problem involving asymmetry between states is much worse than a simple Prisoners' Dilemma where the calculation of meta-strategies implies the choice of the first-best solution. Where asymmetry holds, there is no strategy available for state A which would force state B to cooperate. The commitment of the rich states to environmental protection in their own countries implies that the tit-for-tat strategy option is simply not there. And ending up in the worst outcome for the entire collectivity of actors may for the poor states be better than reaching the cooperative outcome, because it is either non-feasible, given the

resources the state commands, or there is little interest in the desirability of protecting the common pool? What, then, should state A do? A has to accept that the poor state exploits the rich one, i.e. it has to pay part of the bill for the poor states when they cooperate, i.e. one part takes on the allocation of the public good by itself while the other part free rides.

When the state enters an international regime that has been established in order to counteract collective action problems such as in our case the pollution as well as the depletion of the Baltic Sea, it in no way enters *ex post* as an independent actor with no commitments. Instead, it is characteristic of the state as an actor in international ecology regimes that its role *ex ante* has a profound impact upon the problem, i.e. it is responsible for a number of actions that have had an immense impact upon the problem. Again, the state is not only part of the solution but also involved in the evolution of the tragedy of the commons. The *ex ante* role of the state may be a different one with regard to the rich state and the poor state.

The Communist state displayed a negligence towards ecological matters that is on such as scale that it is difficult to account for. The term "ecocide" has been coined in order to conceptualize the state's impact upon the environmental predicament in Eastern Europe. As a collectivist movement it is strange that Communism should pay such little respect to ecological interests. In any case, the Communist state is poor, meaning that its set of feasible activities in terms of ecology policies is small. But its set of desirable policies has been even smaller.

The tragedy of the Baltic Sea is to a large extent a result of the pollution coming from the former Communist states (Table 4).

Although ecological awareness is growing in the new governments of Eastern Europe, there is the *ex ante* predicament that the former governments in these countries are very much responsible for the pollution and depletion of the Baltic Sea. As long as these new states do not take action themselves

Table 4. Country Source of Pollution/Ton in 1990.

Country	Total Nitrogen (tons/year)	Total Phosphorus (tons/year)
Denmark	8,655	1,994
Sweden	25,900	565
Finland	30,200	900
Russia	108,824	7,934
Estonia	39,800	2,174
Latvia	6,775	1,028
Lithuania	25,830	2,850
Poland	246,185	21,495
Germany	28,860	2,337

Source: HELCOM (1990, 64).

in order to improve upon what their predecessors neglected, they come to the international regime more as a part of the problem than a part of the solution. If they can do little by themselves, why should they enter a Prisoners' Dilemma game in order to reach the cooperative solution, when on their own they worsen the predicament even more year by year?

The only strategy when facing the negligence of the poorer countries is to redefine the terms of the interaction. The rich state cannot play reiterated Prisoners' Dilemma games with the poor state, because it cannot force the latter from the defection alternative to cooperation. Thus, the rich state must offer the poor state incentives to cooperate by taking on part of the costs of reducing the harmful activities in the poor country that bring about pollution and depletion of the common-pool resources. This is not to say that the rich state should not continue its own programmes to reduce the damage done by the rich country. However, it may in reality be more effective to allocate part of the resources for ecology programmes from the rich country to the poor country.

The arrival of the rich and poor states at a cooperative strategy is based not only upon the activities that the rich states undertake themselves to combat pollution and depletion, but also upon the contribution of the rich states to the initiation and implementation of activities by the poor states that would reduce pollution and depletion. The poor states would choose the cooperative solution, because they receive a sort of side-payment, although targeted toward environmental policies.

Since the collective action problems have been overcome not through a reiterated Prisoners' Dilemma game but by means of recognition by the rich states of their own vulnerability due to the different evaluation of the tragedy of the common pool, the problem now becomes a technical one of finding the most efficient policies in terms of a cost/benefit analysis.

The allocation of resources to activities that protect common-pool resources may be looked upon as an optimization problem, where first-best solutions may be stated with regard to alternative inputs of ecology programmes from the rich and the poor states. Alas, things are far from simple due to the fact that the players are states in an asymmetrical interaction where the poor states *ex ante* are very much part of the problem themselves.

States do not simply engage in rationally instrumental activities. States express a number of values, among which autonomy, sovereignty and choice are very important and very visible. Participating in the management of common-pool resources is a means-end rational activity, where costs in relation to benefits can be carefully calibrated. Expressing state sovereignty is a value rational activity, where a lot of prestige is at stake. When rich states invite poor states to cooperate in international regimes orientated towards instrumentally rational activity in order to manage common-pool

resources, then value rational action expressing state prestige may threaten the implementation of first-best solutions.

Combining ecological activities from both state A and state B, the pollution and depletion of the Baltic Sea may be counteracted: the more activities or the more the efficient measures, the more the common-pool resources are protected. The costs of such activities may be expected to differ widely between the rich and the poor states, as very elementary policies are needed in the poor state whereas the addition of new policies to an already existing set-up would be at considerable cost to the rich state.

Optimal environmental policies may not work, because they require humiliating intervention into the poor states or demand too many resource transfers from the rich state to the poor state. There is the danger in an international regime orientated towards, e.g., the tragedy of the Baltic Sea that it would involve too much influence of the rich capitalist states over the poor post-Communist states, or that the technology superiority could lead to the humiliation of the poor by the rich.

First-best solutions in instrumental international regimes set up to the management of common-pool resources may be non-implementable, because the distance between the states is too large. Once the poor states accept transfer payments from the rich states targeted to specific ecology programmes, then there is the accompanying exchange-power problem (Blau 1964). The rich states would never pay for the clean-up activities of the poor states if they were not granted substantial power in the international regime to outline the means and ends of environmental measures.

Thus, there arises a different kind of collective action problem. In an asymmetric interaction where the stronger part gives advice to the weaker part, power relations are bound to rise that are difficult to accommodate within the framework of sovereign states.

Conclusion

From being initially pessimistic about handling the tragedy of the common problem there is now a more optimistic tone coming from neo-institutionalist analysis of the sources of the origin and preservation of negotiated rules that offer first-best solutions to the problem of managing common-pool resources. The tragedy of the commons is described by means of the Prisoners' Dilemma model, and the Pareto-efficient solution is achievable by the resort to institutions that may be backed by mutual consent and interests.

We argue that this new analysis is much too optimistic. The establishment of international ecology regimes to attack the tragedy of the common problem is beset with difficulties that are not recognized in the simple Prisoners' Dilemma model. Besides the elements of *ex ante* state

commitments, asymmetric interaction between different kinds of states and functionalist state roles, there are the opportunistic aspects of state action which make states diverge from first-best solutions simply for reasons of state prestige.

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