

**Institutional Dimensions of  
Global Environmental Change**

**IDGEC**

**Performance of Exclusive  
Economic Zones**

**By**

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## **Executive Summary**

### **THE PERFORMANCE OF EXCLUSIVE ECONOMIC ZONES (PEEZ)**

The Performance of Exclusive Economic Zones (PEEZ) program constitutes a flagship activity of the international research project on the Institutional Dimensions of Global Environmental Change (IDGEC).

#### **Rationale**

The establishment of 200-mile Exclusive Economic Zones (EEZs), bringing over a third of the world ocean under the jurisdiction of coastal states, constitutes one of the most far-reaching institutional changes in international society of the twentieth century. Vast ocean areas with an enormous wealth of natural resources that were previously open to all as part of the high seas have been turned into assets of coastal states. A principal justification for this change was the growing sense during the decades leading up to the third United Nations Conference on the Law of the Sea (UNCLOS III) that international efforts to manage human uses of marine resources had failed. More than 100 EEZs are currently in force.

Although outcomes have varied, actual achievements have fallen well short of the expectations justifying the creation of EEZs. The number of overexploited or depleted fish stocks has increased. Pollution levels in many areas are higher than they were before the change. And conflicts among multiple uses of ocean resources are on the rise. Many factors in addition to the prevailing system of ocean governance have contributed to this state of affairs. But institutions do play a role in accounting for variance in the condition of marine systems.

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## Assessing the Effects of EEZs

The purpose of PEEZ is to assess the consequences attributable to the shift from a regime based on "open access" to the resources of the high seas to the enclosure of vast ocean areas within the exclusive economic zones of coastal states from the 1970's onwards. As an IDGEC activity, PEEZ directs attention to living marine resources and highlights the consequences of EEZ-based regimes in the Circumpolar North and Southeast Asia.

The core concern of the PEEZ program is captured in the following question:

*How has the establishment of EEZs and the resultant shift in jurisdiction over living marine resources affected the conservation and use of these resources?*

More specifically, PEEZ addresses four broad clusters of effects associated with EEZ-based regimes:

*Biophysical Effects:* Why has the creation of EEZ-based regimes generally failed to initiate an era of more sustainable fishing practices, and how can we account for variance in the performance of EEZ regimes in terms of sustainability?

*Socioeconomic Effects:* How has the establishment of EEZs affected the distribution of ocean wealth? To what extent have coastal states succeeded in using these assets in an efficient manner?

*Governance Effects:* How have EEZs affected the perceptions of coastal states of their roles and interests as well as their practices in developing cooperative arrangements that require modifications of traditional views of sovereignty.

*Knowledge Effects:* How do EEZs affect the development and the introduction of ideas about resource management and conservation and, in the process, the knowledge base of key players?

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The fact that more than 100 EEZ-based regimes are now in operation opens up attractive opportunities for comparative analysis. The expectation is that this IDGEC flagship activity will provide a platform for a number of analysts using the same concepts and data sets but basing their research on different approaches to the demonstration of causal links between institutions and major types of consequences. Over time, this should add significantly to our understanding of the Performance of Exclusive Economic Zones and, more generally, to our knowledge of the ways in which institutions affect human actions relating to largescale environmental matters.

### **Policy Implications**

Understanding why the introduction of EEZ-based regimes has failed to solve problems of sustainability should help to guide efforts to make the adjustments needed to achieve the original objective underlying this major institutional change. Similarly, knowledge of the consequences of these regimes with regard to matters of equity and efficiency should contribute to modifying important features of EEZ-based regimes in the future. Accordingly, the development of detailed research designs within the PEEZ framework will include consultations with policymakers and scientists located in intergovernmental agencies (e.g. the FAO), nongovernmental organizations, and management agencies located within national governments (e.g. the Department of Fisheries and Oceans in Canada). The result will be a research program responsive to the concerns of managers and policymakers and, in due course, a stream of scientific findings that can help to improve the performance of EEZ-based regimes.



## **THE PERFORMANCE OF EXCLUSIVE ECONOMIC ZONES (PEEZ)**

The acknowledgment and formal establishment of Exclusive Economic Zones (EEZs), largely during the 1970s and 1980s, brought more than a third of the world's oceans under the jurisdiction of coastal states, thus introducing one of the most far-reaching institutional changes in international society of the twentieth century. Today, more than one hundred EEZs are in force, covering virtually all continental shelf resources and most of the world's fisheries.

The Scientific Steering Committee of the international project on the Institutional Dimensions of Global Environmental Change (IDGEC) has decided to launch a program of studies dealing with the consequences of this institutional change through the Performance of Exclusive Economic Zones (PEEZ) framework outlined in this scoping report. The objective of PEEZ is to contribute to our understanding of the roles that institutions play in global environmental change and, more specifically, to address IDGEC's focus on the reasons why some institutional responses to environmental problems prove more effective than others (IDGEC 1999). Through a systematic investigation of the performance of the EEZs in terms of sustainability, efficiency, governance, and knowledge, PEEZ aims to enhance our understanding of the ways institutions work in practice, a matter of substantial interest to the policy community as well as the science community.

PEEZ does not seek to assess all the consequences associated with the creation of EEZs. Rather, it highlights the performance of EEZs with regard to living marine resources, and grants priority to IDGEC's core regions: the Circumpolar North and Southeast Asia. The purpose of this scoping report is to spell out a set of key science questions regarding the performance of EEZs and to identify analytic procedures and data sets as well as organizational matters relevant to this research program.

## **1. Introduction to Exclusive Economic Zones**

With the establishment of EEZs, vast ocean areas with an enormous wealth of natural resources that were previously open to all appropriators were turned into assets of coastal states. A principal justification for this change was the growing sense during the decades leading up to the third United Nations Conference on the Law of the Sea (UNCLOS III) that international efforts to manage human uses of marine resources had failed. A new institutional approach was required. The creation of EEZs granted coastal states extensive rights to natural resources located in a zone extending out to 200 nautical miles (320 kilometers).

Although outcomes have varied, actual achievements have fallen well short of the objectives justifying the creation of EEZs. The number of overexploited or depleted fish stocks has increased. Pollution levels in many areas are higher than they were before the change. And conflicts among multiple uses of ocean resources are on the rise (United Nations 1998). This state of affairs has been brought about by many factors in addition to the prevailing system of ocean governance. But institutions—the rules of the game—do play a role in accounting for variance in the condition of marine systems. This poses the following questions: To what extent have the aspirations of those who advocated the creation of EEZs been met? Are there systematic patterns of successes and failures relating to the use of marine resources that are attributable to institutional factors? Can we draw insights from the experience with EEZs to improve the design of institutional responses to other environmental challenges?

## **2. Rationale for Research on EEZs as Institutional Phenomena**

The oceans are governed by a multitude of institutions dealing with diverse issue areas (such as navigation, fishing, or pollution) and operating at different levels of social organization.<sup>1</sup> From the seventeenth century onward, the oceans were separated into “territorial waters,” a narrow band where coastal states possessed rights similar to the rights they exercise over their land territory, and “high seas,” a vast area in which all states enjoyed the freedom to use those waters and the associated natural resources as they saw fit.

This system rested on the premise that the resources of the ocean were infinite or, in any case, greater than the demands placed upon them by human users. As it became evident that the oceans and their natural resources were in limited supply, the system of rules implying that the natural resources of the high seas belonged to no one (*res nullius*) came under pressure. In the early post-World War II period, coastal states initiated a series of unilateral extensions of jurisdiction to reduce pressure on natural resources and secure for themselves a greater share of the wealth of the oceans.

These unilateral actions provided the impetus for the first and second United Nations Law of the Sea Conferences, held in 1958 and 1960, which produced four conventions but did little to resolve the fundamental problem of creating a governance system capable of managing growing uses of ocean resources.<sup>2</sup> Several events during the 1960s and early 1970s, among them continued unilateral assertions of rights on the part of coastal states (Juda 1996) and decoupling of security and economic issues (Friedheim 1993), led to UNCLOS III, starting in 1973. By then, the idea of extended coastal state jurisdiction had matured, and a consensus soon emerged that coastal states should be accorded “sovereign rights” over the natural resources located in a zone stretching 200 nautical miles seawards, as measured from their coastal baselines (Friedheim 1993; Miles 1998).

Extended coastal state jurisdiction changed the prior system of ocean governance by adding the category of EEZs to cover a large area located between territorial waters and the high seas. Coastal states have the final say regarding how resources are utilized in the EEZs (Burke 1994; Churchill and Lowe 1999); they also have jurisdiction over scientific activities and the authority to devise rules to protect the marine environment. Yet coastal state authority in the EEZs is not unlimited. Coastal states have a duty to ensure that the living resources of the EEZs are not endangered by overexploitation and to consult with other states regarding the use of shared resources. Other states retain rights to navigation, overflight, and the laying of submarine cables within the EEZs.

In the second half of the 1970s, a large number of states claimed 200-mile zones (Burke 1994). When UNCLOS III came to an end in 1982 and the final text of the Law of the Sea Convention

(LOSC) was signed, the EEZ concept was firmly established in customary international law. By the time LOSC finally entered into force in 1994, more than one hundred coastal states had enacted legislation establishing 200-mile extended jurisdiction in some form. These EEZs constitute a common framework within which coastal states have created national and subnational arrangements governing human activities taking place within their zones. At the same time, the EEZs are nested into the larger framework of the law of the sea and embedded within overall institutional arrangements in international society. The result is both a striking departure from the preexisting arrangements governing marine systems and a complex structure of institutions encompassing considerable variation within a common framework.

The creation of EEZs did not solve all the problems attributable to the authority deficit in ocean governance (Sætersdal and Moore 1987; Vidas and Østreng 1999). Initially, few states had the domestic arrangements needed to manage the natural resources in these extended zones. There is still great variation in the character and effectiveness of the regimes that coastal states have put in place to govern activities taking place in their exclusive economic zones. Moreover, the fit between these new institutional arrangements and the biophysical features of the problems they are intended to solve is far from perfect. A large number of fish stocks and petroleum fields have come under the jurisdiction of two or more countries, necessitating the negotiation (and in some cases, judicial settlement) of new territorial boundaries or coordinated or joint management systems. High seas fishing of stocks that straddle the boundaries between waters under national jurisdiction and the high seas emerged as a serious problem (Miles 1989).<sup>3</sup>

Collapses in major fisheries have combined with the growth of a broader interest in protecting marine environments to prompt calls.. for institutional change. Marine conservation has emerged as a global concern as a consequence of the cumulative effects of overfishing and management failures, and this topic has found its way onto the agenda in global fora, such as the 1992 United Nations Conference on Environment and Development (Hey 1996; Hoel 1998). It is now acknowledged that international coordination may be required to manage natural resources located in the EEZs when these resources

are shared between countries or straddle boundaries to the high seas. Institutional developments arising from this realization include the 1995 Food and Agriculture Organization Code of Conduct for Responsible Fishing and the 1995 United Nations Fish Stocks Agreement, which seek to rectify weaknesses associated with the regime for fishing in international law (Balton 1996).<sup>4</sup> Broader still is the growth of concern for the protection of marine biological diversity (Norse 1993) and the resultant effort to apply the principles of the 1992 Convention on Biological Diversity to activities in the EEZs (DeFonteaubert et al. 1998). Some observers have concluded that EEZ-based institutions remain deficient in terms of the requirements for ocean governance and that more authoritative global institutions are needed to ensure the sustainable use of the world's ocean resources (Borgese 1998; IWCO 1998). Conversely, there is a growing realization that local institutions (Ostrom 1990), such as customary systems of sea tenure and co-management systems (Johannes 1978; Jentoft 1998), have a continuing role to play in countries where governments have created strong national regimes to manage EEZs.

### **3. Assessing the Effects of EEZs**

The principal goal of PEEZ is to analyze the consequences resulting from the change from a regime based on "open access" to the resources of the high seas to a regime involving enclosure of vast ocean areas into exclusive economic zones from the 1970s onwards. The concern here is not with the processes leading up to the establishment of EEZs (Sebenius 1984; Friedheim 1993). Nor does this activity aim to account for all possible effects of EEZs. Rather, the core concern centers on the management of living marine resources with particular reference to the Circumpolar North and Southeast Asia. The central concern can be stated as follows:

*How has the establishment of EEZs and the resultant shift in jurisdiction over living marine resources affected the conservation and use of these resources?*

While many performance indicators are available, PEEZ will contribute to the work of IDGEC by addressing four prominent clusters of effects associated with EEZ-based regimes: biophysical effects, socioeconomic effects, governance effects, and knowledge effects.

Because more than one hundred national EEZ regimes are now in place, researchers exploring the performance of these arrangements will observe considerable variance. Though they share defining legal attributes, the national regimes vary among other things with regard to additional legal bases, administrative structures, and effectiveness. Accounting for the sources of this variance is one of the goals of the PEEZ program.

### **3.1. Biophysical Effects**

First and foremost, institutions can affect the biophysical condition of ecosystems in which human actions play an important role. A major rationale for the creation of EEZs in the 1970s was the perception that multilateral fisheries commissions were ineffective in the sense that they had been unable to prevent collapses in a number of fish stocks. The introduction of EEZs, as an institutional response to this problem, shifted management responsibilities to coastal states on the assumption that those most dependent upon fisheries resources would have a stronger interest than others in long-term conservation. Yet resultant increases in the total world catch of marine fish have been accompanied by growing problems of stock depletions and other signs of unsustainable harvesting (FAO 1997; Botsford et al. 1997; Pauly et al. 1998). According to the FAO, 16 percent of the world's fish stocks are now overexploited and 6 percent are classified as depleted, while 44 percent are fully exploited. Little change in this situation has occurred since the early 1990s (FAO 1998). Some 60 percent of the major fisheries in the world are in need of management action (Garcia et al. 1999).

The potential biophysical effects of EEZs may include changes in the status of stocks of living marine resources and, more broadly, the condition of large marine ecosystems attributable to the establishment of expanded coastal state jurisdiction (Sherman and Duda 1999).<sup>5</sup> The key issue here is sustainability and the introduction of new ways of thinking about the sustainability of marine ecosystems (see also the discussion of governance effects below). Sustainability debates have a long history in the realm of fisheries, as fisheries science has been instrumental in developing the concept of sustainability for several decades (Charles 1994). Early attempts to assess the biophysical impacts of EEZs include Sætersdal and Moore's

1987 study, which attempts to summarize developments in the world's major fishing regions; an early Organization for Economic Cooperation and Development effort (OECD 1984), and Miles' 1989 project, which takes a somewhat broader perspective. The FAO carries out global studies of the status of fish stocks on a regular basis (FAO 1997, 1998).

The core question here is: *Why has the creation of EEZ-based regimes generally failed to initiate an era of sustainable fishing practices, and how can we account for variance in the performance of EEZ regimes in terms of sustainability?*

More specific questions arising from this central concern are:

- *How can we separate the effects of institutions from the effects of non-anthropogenic forces (e.g., changes in water temperature) operating in marine systems?*
- *What factors account for variance in the performance of EEZ-based regimes in terms of sustainability?*
- *How do institutional and natural factors interact in this setting, and how can we evaluate the fit or match between management regimes and marine ecosystems?*

### **3.2. Socioeconomic Effects**

Institutions affect the welfare of the individuals and human groups whose activities they govern. The principal socioeconomic effects arising from the operation of EEZ-based regimes involve matters of equity (for example, the distribution of wealth among participants) and efficiency (for example, economic impacts on the fishing industry and on coastal communities).

UNCLOS III produced two major distributive norms. Deep seabed minerals beyond the bounds of national jurisdiction became the common heritage of humankind, with control over their exploitation vested in an International Seabed Authority (ISA) operating under UN auspices.<sup>6</sup> The near-shore resources, on the other hand, were nationalized through the rights granted to coastal states in the EEZs, thereby continuing the trend initiated with the 1958 Continental Shelf Convention. One major consequence of the creation of EEZs has

therefore been a sizable redistribution of wealth. The immediate losers were distant water fishing nations, whose responses have included moving their fisheries to the high seas, purchasing fishing rights from coastal states, and reducing the size of their fleets. The response of the coastal states has in many cases featured subsidizing an expansion of their fishing capacity to capitalize on the new wealth, a development that has triggered a doubling in global fishing power since the 1970s (Iudicello, Weber, and Wieland 1999). The expansion has however stagnated in the 1990s (FAO 1998).<sup>7</sup> The resultant overcapacity in global fishing power is a major part of the explanation for the poor state of fish resources globally (McGoodwin 1991; McGinn 1999).

The socioeconomic consequences of exclusive economic zones also encompass efforts to build on the creation of EEZ-based regimes to improve the performance of the fishing industry. The results flowing from these efforts vary widely (Christy 1996; Hannesson 1997; OECD 1997). This in turn has affected coastal communities assumed to be the prime beneficiaries of the EEZs and produced striking differences in the fates of coastal communities under EEZ-based regimes (Apostle et al. 1998). The establishment of EEZs also shifted the allocation of ocean resources by changing global trading patterns for seafood. Some fishing nations increased their imports of fish products while others increased their exports. Other trade-related developments arise from efforts to use trade measures to influence the management of marine resources, as exemplified by the tuna/dolphin controversy (McDorman 1992, McLaughlin 1997).

The core concern here is: *How has the establishment of EEZs affected the distribution of ocean wealth? To what extent have coastal states succeeded in using these assets in an efficient manner?*

Specifically:

- *How have benefits been redistributed internationally and nationally as a result of bringing marine resources under the jurisdiction of coastal states?*
- *How have EEZ-based regimes affected the capacity of fish stocks, treated as factors of production, to produce economic returns and rents?*

- *How has the establishment of EEZs affected international trade in fish products and how are users of ocean resources affected by trade practices?*

### **3.3. Governance Effects**

Changes in governance systems, such as the creation of EEZ-based regimes, often have ramifications beyond the boundaries of the regimes themselves. In the case of EEZs, these effects have flowed downward to the domestic regimes established by states and upward to institutional arrangements operative at the level of international society.

Looking downward, EEZs constitute an institutional umbrella within which a variety of related initiatives have unfolded. Thus, individual coastal states have created distinct national regimes to deal with fisheries and other marine resources over which they have acquired jurisdiction as a result of the creation of EEZs. All these arrangements build on the same framework, but they differ significantly in other respects, including the biophysical and socioeconomic effects they have produced. By privileging national regimes, moreover, the establishment of EEZs has subordinated local and largely customary systems of marine tenure to new sets of rules governing the use of ocean resources. The formal policies and decision-making procedures characteristic of national institutions can displace or undermine informal, local arrangements, and can generate important biophysical and socioeconomic consequences (Young 1982; Jentoft 1998; Apostle et al. 1998).

Looking upward, on the other hand, it is possible to explore the impacts of EEZ-based regimes on the ways in which states define their roles and interests and, more broadly, on the theory and practice of sovereignty in international society. The rights of coastal states to the EEZs are far-reaching, but not identical to the bundle of rights generally associated with sovereignty. By introducing a new configuration of rights, distinct from those exercised in territorial waters or those associated with the high seas, UNCLOS III initiated an institutional experiment in which sovereignty is not approached in absolute or indivisible terms.<sup>8</sup> The rights conferred on coastal states through the creation of EEZs place them in the roles of managers and

caretakers of marine ecosystems. With the passage of time, absolutist characterizations of the rights associated with EEZs have also been tempered by a growing understanding of the need for cooperation among adjacent states and between coastal states and distant water states to ensure the sustainability of fish stocks. Both the theory and the practice of sovereignty undergo transformations in response to functional problems arising from interdependencies (Litfin 1998; Krasner 1999). Recent developments in state practice in cooperative fisheries management (e.g., the activities of the Northeast Atlantic Fisheries Commission [NEAFC] with regard to the enforcement of regulations) and in other areas (e.g., joint development zones for oil and gas) suggest that new ways of thinking about sovereignty with regard to the resources of the EEZs are emerging.

The core question here is: *How have EEZs affected the perceptions of coastal states of their roles and interests as well as their practices in developing cooperative arrangements that require modifications of traditional views of sovereignty?*

Specific issues for consideration include:

- *How have coastal states constructed national regimes within the framework provided by the EEZs?*
- *How has the creation of EEZs affected the interplay among international regimes, national management systems, and traditional systems of marine tenure and co-management operating at the local level?*
- *How has the development of EEZ-based regimes governing ocean resources affected the general practice of sovereignty in international society?*

### **3.4. Knowledge Effects**

Institutions are both affected by and affect developments in the knowledge, beliefs, and values that shape human actions (Andresen and Østrem 1989; Goldstein and Keohane 1993). The institutional shift reflected in the movement from freedom of the high seas to ocean enclosure has been accompanied by alterations in the intellectual frameworks of fisheries scientists and others concerned with the management of marine resources.

The LOSC requires promotion of marine science and empowers coastal states to regulate the conduct of science in their waters (Roach 1996). More generally, ideas of sustainability have led to the development of at least two changes in the intellectual frameworks of those responsible for administering national management systems established under the EEZ framework. Fisheries management in most systems is still based on *single-species* models developed in the 1950s, aiming at some notion of a maximum sustainable yield (Larkin 1977). But a few cases, management practices have evolved to include *multispecies interactions*, where relationships among commercial species are considered (Hannesson 1983; Flaaten 1988), and *ecosystem perspectives*, where the relationships between harvested species and their environment are considered (Burke 1994; Ecosystem Principles Advisory Panel 1999). Another change involves attitudes toward risk and uncertainty (Ludwig, Hilborn, and Walters 1993; Wilson et al. 1994; Francis and Shotton 1997) and, more specifically, the introduction of precautionary approaches in the management of fisheries and marine ecosystems (Garcia 1994; Hewison 1996).

Institutional changes, such as the creation of EEZs, can facilitate or impede such cognitive developments in several ways. Shifts in rules and decision-making procedures often reflect new ways of thinking, such as precautionary approaches (Garcia 1994); they can provide conveyor belts for the introduction of such perspectives into day-to-day management practices (Nakken et al. 1997). Once embedded into institutional rules, intellectual frameworks shape the background knowledge from which agents draw when making decisions (Walsh 1999). In addition, regimes can provide vehicles for the efforts of leaders of epistemic communities to inject the prescriptions of such transnational networks of scientists and policy analysts into the practice of resource management (E. Haas 1990; P. Haas 1990).

The core question here is: *How do EEZs affect the development and the introduction of ideas about resource management and conservation and, in the process, the knowledge base of key players?*

Specific issues include:

- *Have EEZ-based regimes provided mechanisms for changing the knowledge available to managers of fisheries?*
- *To what extent are new sustainability indicators internalized by actors in EEZ-based regimes?*
- *How are ideas that are emerging at the global level (e.g., the precautionary approach) reflected in the practices of national EEZ regimes?*

#### 4. Analytical Approaches and Methodological Concerns

The basic structure of the Performance of Exclusive Economic Zones program is straightforward. It involves an effort to add to our knowledge of the consequences of institutions through an in-depth study of the impacts of exclusive economic zones in four broad areas: biophysical effects, socioeconomic effects, governance effects, and knowledge effects. This scheme is portrayed in Figure 1.

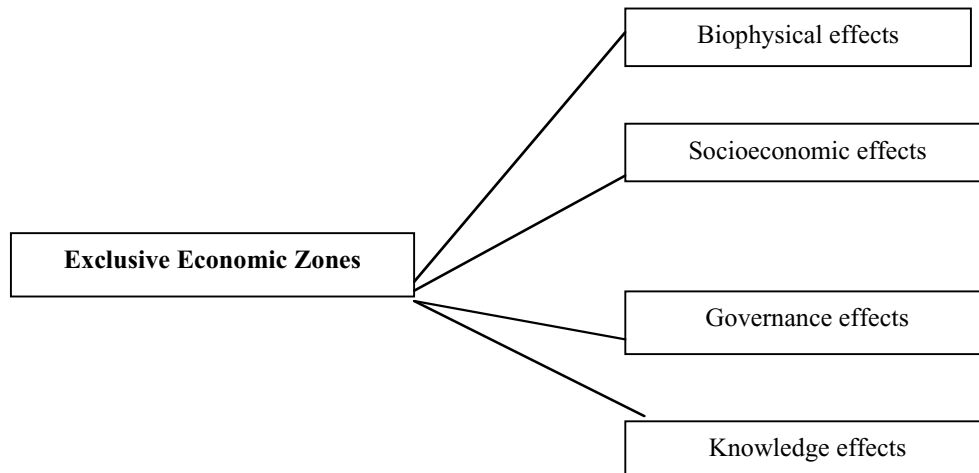


Figure 1: Analytical Scheme

#### **4.1. Analytical Concerns**

The four groups of effects—the dependent variables within this framework—consist of related phenomena that are grouped together for purposes of analysis rather than as statements of fact. Other types of effects might be considered in a comprehensive study of the performance of EEZs. But the objective here is to single out particularly important effects whose analysis promises to contribute to IDGEC's larger concern with the factors that account for variance in the performance of regimes relevant to large-scale environmental changes.

Complex interactions may occur among these dependent variables in many cases. For example, distributive effects may influence the biophysical condition of key ecosystems. Shifts in production for export by individual countries or conflicts between different types of uses can put pressure on marine ecosystems. Shifts in knowledge (such as the transition from single-species management to ecosystems approaches) are likely to produce both biophysical and socioeconomic effects.

Analyses of the performance of EEZs must take into account the operation of local, national, and international institutions through which the effects of EEZs manifest themselves. The creation of EEZs would not have far-reaching consequences if the process were not accompanied by changes in national and international institutions intended to capitalize on and give effect to the rights and obligations that EEZs establish. Such institutions can be envisaged as intervening variables in the scheme above.

The fact that more than one hundred EEZ-based regimes are now in operation opens up attractive opportunities for analysis. The basic challenge associated with this activity is to demonstrate causal connections between the establishment of EEZ-based regimes covering large marine areas and consequences in the four primary areas outlined in the preceding section. Structured, focused case studies selected to encompass the operation of EEZ-based regimes in a variety of geographical, ecological, socioeconomic, and cultural settings constitute one obvious way forward in this realm (George 1979). But the availability of a sizable number of cases makes it

possible to make use of other analytic techniques, including procedures involving statistical inference and qualitative comparative analysis (Ragin 1987; Miles et al. forthcoming).

#### **4.2. Data Requirements**

The availability of data needed to study the performance of Exclusive Economic Zones varies substantially from one class of effects to another. There is also variation in the availability of data regarding links between the EEZ framework and various national EEZ-based regimes.

Biophysical data on trends in fisheries are available on a global scale, although a number of caveats apply to sweeping generalizations about biophysical effects.<sup>9</sup> A major source for global data, as well as for regional data sets on resource development, is the FAO. Several regional organizations (such as International Council for the Exploration of the Sea [ICES] and NEAFC in the Northeast Atlantic area) are useful sources of data regarding regional developments in the fisheries. Not surprisingly, national sources of data on such matters vary with regard to the coverage, quality, and compatibility of data sets.

Obtaining data on socioeconomic effects presents additional problems. Although no international standards have been set for this type of data, early attempts to generate usable data on trends relating to equity and efficiency can be found in an European Union–funded program on fisheries management in the North Atlantic (Symes 1998). Acquiring data on such matters becomes more difficult when we move up the scale from the community level to the national and international levels. A number of studies address issues relating to fishing industries (Neher, Arnasson, and Mollet 1989; OECD 1996), but the extent to which specific regions are covered and the compatibility of these data are unclear.

Studies of governance effects and knowledge effects will require the development of new data sets. The FAO and the Department of Oceans and the Law of the Sea (DOALOS) at the United Nations in New York hold most of the relevant information on the EEZs themselves. Assessments of the development and implementation of

EEZ-based regimes, however, will require more extended research in individual countries. A promising development regarding knowledge effects is the growing effort to devise reference points as indicators of sustainability (Mace 1994; Nakken et al. 1997).

To a certain extent, the PEEZ research program will be driven by the availability of data or resources to develop new data sets. This may lead to choices involving the prioritization of the research foci described in the preceding section and the sequencing of specific research activities over time. Research can begin in areas where good data already exist, even while efforts are underway to develop new or better data relating to other topics.

### **4.3. Organization**

The Performance of Exclusive Economic Zones Project is intended to provide a platform for the work of a number of analysts using the same concepts and data sets but basing their research on different approaches to the demonstration of causal links between institutions and major types of consequences. Over time, this should add significantly to our understanding of the performance of EEZs and, more generally, to our knowledge of the ways in which institutions affect human actions relating to large-scale environmental matters.

As a point of departure, PEEZ will work through two regional networks, one for the Circumpolar North and a corresponding one for the Southeast Asian region. Overall coordination of PEEZ research and integration of the two regional efforts will involve workshops organized by the PEEZ working group of IDGEC's Scientific Steering Committee.

## **5. Policy Implications**

The principal goal of the PEEZ flagship activity is to broaden and deepen knowledge pertaining to IDGEC's Research Focus 2, which asks: *Why are some institutional responses to environmental problems more successful than others?* By differentiating several classes of effects and examining how they play out in a major issue area that has been characterized by dramatic institutional changes over the last several decades, it should be possible to pinpoint a number of factors that

account for variation in the performance of specific institutional arrangements.

Findings flowing from the research carried out under the auspices of this activity should prove useful for policy purposes as well. Understanding why the introduction of EEZ-based regimes has failed to solve problems of stock depletions in major fisheries could help to guide the adjustments needed to advance toward the original objectives underlying this major institutional change. Similarly, knowledge of the consequences of these regimes with regard to matters of equity and efficiency could provide the basis for adjustments in major features of EEZ-based regimes in the future. Accordingly, efforts to develop detailed research designs within the PEEZ framework will include consultations with policy-makers and scientists located in intergovernmental agencies (such as the FAO) and management agencies in national governments. The result should be a research program responsive to the concerns of managers and policy makers and, in due course, a stream of scientific findings that can help to improve the performance of EEZ-based regimes.

## **6. Next Steps**

The next stage in the development of the PEEZ program is the organization of a workshop designed to prepare collaborative research designs for a series of studies focused on the performance of Exclusive Economic Zones. This procedure should allow flexibility in the analytic procedures selected but, at the same time, serve to ensure that findings are genuinely comparable. The main group of participants in the workshop will be scientists who are able and willing to carry out studies that fit the framework of the PEEZ flagship activity. But for reasons outlined in the preceding section, the workshop will also include policy makers and managers working in this realm.

To disseminate information about this activity and to attract interest on the part of active researchers, the PEEZ program is being presented at various international meetings, notably the June 2000 meeting of the International Association for the Study of Common Property Problems and the July 2000 meeting of the International Institute of Fisheries Economics and Trade (IIFET).

## 7. PEEZ Milestones

The following general time table will guide the PEEZ process:

- outside reviews of scoping report—January–March 2000
- follow-on planning workshop—spring 2001
- presentations at international conferences—during August 2000
- focused research—to begin in 2001

## 8. Notes

<sup>1</sup> Institutions, as used in this report, are systems of rules, decision-making procedures, and programs that give rise to social practices, assign roles to participants in these practice, and guide interactions among the occupants of the relevant roles (IDGEC 1999, 11).

<sup>2</sup> The 1958 continental shelves convention did provide for coastal state sovereign rights to shelf resources as far out as exploration was feasible, thereby paving the way for thinking about sovereignty in non-absolutist terms. Another important development in the 1958 convention was the recognition of the special interest of coastal states in the natural resources adjacent to their territorial waters.

<sup>3</sup> Since some 95 percent of the world catch of marine fish is taken within EEZs, the overfishing problem is largely related to waters under national jurisdiction.

<sup>4</sup> The Code of Conduct aims at assisting countries to improve their management practices through normative guidance and technical assistance. The Fish Stocks Agreement deals with fishing on the high seas but has provisions (such as those dealing with conservation principles) that apply to all waters.

<sup>5</sup> A stock of a living marine resource is a genetically and geographically distinct (sub)population of a species.

<sup>6</sup> The ISA s authority was somewhat diluted by the 1994 Implementation Agreement, however.

<sup>7</sup> The number of vessels larger than 100 Gross Register Tonnes (GRT) is declining.

<sup>8</sup> However, some earlier international agreements also impose limitations on sovereignty. The international servitudes stipulated in the 1920 treaty pertaining to Svalbard are a case in point (Ulfstein 1995).

<sup>9</sup> Direct now-and-then comparisons are fraught with difficulties because the data underlying various assessments are unlikely to be directly comparable. Substantial variation exists between and within regions with regard to the availability and quality of data. It is not clear how much of the variation in fish stocks can be attributed to fishing relative to natural forces. Biophysical effects of institutional change may take decades to emerge, and variation attributed to institutional factors may be the result of other driving forces.

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