

20 Can Integrated Coastal Management Solve Agriculture–Fisheries–Aquaculture Conflicts at the Land–Water Interface? A Perspective from New Institutional Economics

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Abstract

The principles of integrated coastal area management have been widely adopted and advocated by the international community. However, integrated coastal management has been less successful in practice and, in many areas, conflicts over resource use still prevail. This chapter explores the causes for such conflicts from the perspective of New Institutional Economics (NIE). It argues that conflicts are not only the result of competition for resources, but predominantly the outcome of institutional failures, that is, the ability of institutions in place (if not their simple absence) to address coastal zone issues. The case of shrimp culture development in India is used as an illustration of the NIE concepts presented. Decentralization and devolution, when meeting specific institutional requirements identified with NIE as a framework of analysis, are suggested as a suitable reform process to stimulate environmentally and socially sustainable coastal zone development. In this respect, sectoral capacity building of user groups followed by strengthening of local government capacity to integrate and adequately address sectoral concerns are considered as practical measures for improving the efficiency of current coastal zone management schemes.

Introduction

The aim of this chapter is to demonstrate that the lack of results achieved through integrated coastal management is not directly related to

the occurrence of competitive conflicts for resources at the land–water interface,² but to a failure of institutions to provide a suitable environment to address coastal issues. Limited achievements of integrated coastal manage-

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² Unless specified otherwise, 'coastal zone' refers specifically to the geographical area where marine and terrestrial environments meet (by opposition to freshwater-land environments). It is understood to have the same meaning as the perhaps more narrowly defined 'land–water interface'.

ment schemes and reasons for conflicts are explored from the perspective of New Institutional Economics (NIE). Much time has been devoted in the past to studying physical phenomena in coastal zones. Today, however, the problem has shifted from understanding environmental processes to allocating limited, yet renewable, coastal resources to often-competing economic uses. In most instances, such uses are traditional and not supported by legal rights, as is the case with coastal fisheries. In addition, land–water interfaces are ecologically sensitive zones. Modification of the ecosystem resulting from resource use tends to affect other uses through the creation of externalities.³ As coastal resources tend to support high-value economic activities (e.g. shrimp farming) as well as the livelihoods of many poor people (e.g. small-scale fishing or farming), managing and allocating coastal resources while minimizing interferences involve addressing simultaneously growth and equity issues. Efficient and socially acceptable distribution is a key to the sustainable development, in both economic and environmental terms, of coastal areas. Conflicts are an inevitable outcome of a distribution perceived as unfair by specific groups of resource users.

The paradigm of integrated coastal management has been to identify conflicts occurring at the land–water interface and to provide means of resolving them to ensure sound management of coastal environments. Concepts from NIE can shed light on the actual *causes* of conflicts and suggest necessary steps towards institutional reform to limit their occurrence and reconcile multiple resource uses for successful coastal development.

This chapter begins by setting the context and principles of integrated coastal zone management. A second section focuses on the reasons for conflicts in coastal zones, which are then placed in the perspective of NIE to better understand their causes (third section). A fourth section presents the requirements for successful decentralization,

devolution and institutional strengthening towards improved coastal conflict management and sustainable resource use. Despite the range of economic activities occurring in coastal areas, such as transport, energy generation, military, tourism development, etc., the scope of the chapter has been narrowed to deal specifically with agriculture, aquaculture and fisheries interactions.

Integrated Coastal Management in Context

Uptake of integrated coastal management at the international level

The importance of coastal zones, in particular areas at the land–water interface, in supporting multiple economic activities and environmental functions is now well established. The concept of integrated coastal zone management stemmed from earlier developments with respect to ‘integrated watershed management’ and ‘integrated river basin management’. It emerged from the realization that coastal zone components (land, water, forests) and the range of economic activities they supported could not be managed in isolation from one another. In the wake of the UNCED Rio Conference in 1992, which underlined the need for new, integrated and precautionary approaches to the management of coastal areas (Chapter 17 of Agenda 21), many international agencies embraced the concept of integrated coastal management and advocated its implementation. This contributed to growing awareness of the sensitivity of land–water fringes to human interventions, in particular in poverty-stricken areas, to which many guidelines for implementing integrated coastal management principles were oriented (e.g. Clark, 1994; Scialabba, 1998). Because of the importance of fisheries in these areas, from either capture or culture systems, the FAO took an active role in the promotion of sustainable coastal manage-

³ *Externality* has been defined as an agent’s unidirectional activity on the environment, which results in an uncompensated loss of welfare for other agents (Pearce and Turner, 1990).

ment (e.g. FAO, 1999 for aquaculture; Willmann and Insull, 1993 for fisheries). The Code of Conduct for Responsible Fisheries, adopted by member countries in 1995, specifically refers to the fragility of coastal ecosystems and the need for consultative management (Article 10.1).

Implementation of integrated coastal management: success and limitations

Although objectives of integrated coastal zone management differ from region to region based on local practices and uses, they usually address habitat restoration, resource allocation and development of various economic sectors (Clark, 1994). Consultation mechanisms must be activated to resolve two intertwined problems: one of conflict and one of sustainability (i.e. sustainable environmental resource use). Such consultation mechanisms, emanating from bottom-up, cross-sectoral participation and collective action at micro and meso levels, have been widely adopted. Community-based management, co-management initiatives (featuring prominently in coastal fisheries management) and the constitution of organizations promoting environmentally sustainable use of coastal resources have been hailed as suitable alternatives for the management of disputed resources (e.g. Arriaga *et al.*, 1999 for Ecuador; Masalu, 2000 for Tanzania; Rouf and Jensen, 2001 in the case of Bangladesh Sunderbans). Criteria for successful collective action in managing common resources are not new (Olson, 1971; Ostrom, 1990): reasonable group size, homogeneity of participants and agreed purpose are conditions for the successful organization of stakeholders in associations, cooperatives or resource-user groups for collective action at a local level.

However, unless group members had a financial stake in actions undertaken, cooperatively run associations were also reported to fail. They suffered from organizational problems, bureaucratic inefficiencies and lack of clearly defined property rights, which triggered opportunistic behaviour (e.g. free-riding, power influence affecting wealth

distribution among members) and lack of investment incentives, in both time and financial terms, in the structure (Cook and Iliopoulos, 2000). Many integrated coastal management schemes in the tropics have failed at the implementation stage (Westmacott, 2002). Others have been bound with difficulties typically found in developing countries, such as information and communication gaps, restricted technical and financial capacity, strong sectoralism and limited democratic representation (Windevoxhel *et al.*, 1999).

On Conflicts at the Land–Water Interface: Perspective from New Institutional Economics on the Limitations of Integrated Coastal Management

Overall limitations of integrated coastal management initiatives can be traced to two interlinked factors: people and the *institutions* they create. It is not physical resources *per se* that need to be the focus of management, but rather human behaviour (FAO, 1998). The land–water interface, where resources ‘overlap’ and where access and use rules are complex, if not ill defined, is an ideal context in which to study how human interactions and institutions function and influence environmental sustainability.

Institutions and New Institutional Economics: defining the concepts

Institutions have been defined as a set of formal rules (laws, contracts, political systems, organizations, markets, etc.) and informal rules of conduct (norms, traditions, customs, value systems, religious beliefs, etc.) that facilitate coordination or govern relationships among individuals or groups (North, 1990). They influence human behaviour and therefore economic outcomes such as economic efficiency, economic growth and development, which reciprocally often result in changes in institutions (Kherallah and Kirsten, 2001).

New Institutional Economics rose from the

questioning of the fundamental assumptions of neo-classical economics,⁴ and examines the role of institutions in furthering or hindering economic growth. According to North (1993), NIE ‘adds institutions as a critical constraint and analyses the role of transaction costs as the connection between institutions and costs of production’.⁵ In a world of incomplete information and limited cognitive capacity, humans impose constraints (rules, etc.) to structure their exchanges. The formation of institutions is thus determined by the costs of transacting. The critical role of institutions is to create stable structures for human interactions while minimizing costs and uncertainty in transactions.

How does New Institutional Economics relate to coastal conflicts?

Conflicts over natural resources exist because human beings compete for the same scarce resources to maximize their utility, in other words, because their individual interests and needs cannot be simultaneously satisfied. Because of interdependence,⁶ one agent’s decision to physically modify or use one resource affects other agents’ options of use, thereby reducing other users’ utility or satisfaction and resulting in conflicts. The ecological fragility of coastal areas can only exacerbate conflicts and losses incurred.

Although conflict occurrence is often linked to ethnic or social rivalries and their roots are understood from a cultural perspective, economic factors and interests often lurk in the background (Bardhan, 1997). These interests can manifest themselves in the form of conflicts: (i) *within sectors* (e.g. large- versus small-scale fishers or aquaculture operators); (ii) *between sectors* (e.g. between fisheries and other sectors); or (iii) *between objectives* (e.g. planning agencies with

diverging objectives such as environmental protection, economic development, social equity) (Béné *et al.*, 2004). The origin of each type of conflict can be better comprehended in the light of NIE concepts.

Conflicts within sectors: interdependence and ill-defined property rights

Conflicts within sectors are often closely linked to the allocation, perceived as unfair, or ill definition of property rights, which are a form of institutional arrangement. Interdependence of agents with incompatible interests, that is, the fact that the choice of one agent influences that of another (Paavola and Adger, 2002), is a first cause of conflicts. This is illustrated in the case of the Indian shrimp industry below. Collective environmental choices are necessary to resolve conflicts and disagreements and these choices imply affirmation or redefinition of endowments, that is, property rights or environmental regulations (Coase, 1960). For Coase (1960), externalities can be internalized through negotiation and bargaining if property rights are well established and if transaction costs are absent. As these two criteria are not usually simultaneously met in developing countries, rational economic decision-making is hampered and conflicts linked to land appropriation and exploitation are exacerbated. From ill definition of formal land property regimes stem long-lasting conflicts and, at the macro level, slow economic advancement (De Soto, 2000; Zak, 2001).

Conflicts between sectors: imperfect information and high transaction costs

Conflicts between sectors are associated with the theory of imperfect information: all institutional arrangements, including both for-

⁴ The fundamental assumptions of neo-classical economics are that: (i) people have rational preferences among outcomes; (ii) individuals maximize utility and firms maximize profits; and (iii) people act independently on the basis of full and relevant information.

⁵ *Transaction costs* are made up of three types: (i) search costs (the costs of locating information about opportunities for exchange); (ii) negotiation costs (costs of negotiating the terms of the exchange); and (iii) enforcement costs (costs of enforcing the contract) (North and Thomas, 1973).

⁶ Interdependence and externalities are closely related concepts, the former belonging to neo-classical economics, the latter to NIE. *Externality* was defined in footnote 3. *Interdependence* is the reciprocal nature of relationships that underlie what are conventionally regarded as externalities (Coase, 1960).

mal and informal contracts, are explained in terms of strategic behaviour under asymmetric information among the different parties involved (Bardhan, 1989). In coastal areas where sectoral 'special interests' (Dixit, 2003) are competing, many decisions regarding resource allocation and use are based on incomplete information (some ecological processes are still poorly understood). They are also influenced by high transaction costs arising from the unbalanced game of economic power forces because necessary institutional arrangements, such as adequately defined property rights, are not in place to minimize them. Transaction costs due to absent or underdeveloped institutions have been found to be higher in developing countries (North, 2000), and this may be a reason for the prevalence of unresolved conflicts in the developing world between fishing, farming, aquaculture and other activities.

Conflicts between objectives: problem of common agency

Diverging objectives within a central planning agency responsible for coastal management can be seen in the framework of common agency. The problem of common agency refers to what are called 'principal-agent' relationships. *Principals* are the actors within a hierarchical relationship in whom authority rests. *Agents* are those linked to the principals and conditionally designated to perform tasks in the name of principals (Lyne and Tierney, 2002). Dixit *et al.* (1997) define *common agency* as 'a multilateral relationship in which principals simultaneously try to influence the actions of one agent'. It is a problem because one agent who has to respond simultaneously to several principals whose interests are not necessarily aligned (Dixit, 2003). Lack of cooperation between stakeholders, multiple tasks and diverging objectives as encountered in coastal areas distort attempts towards integrated planning and management.

Although these issues have been investigated from a qualitative perspective, some researchers have attempted to explore in a quantitative manner some aspects of NIE, in particular the relationship between the existence – or lack – of established property

rights and investment incentives (e.g. Besley, 1995; Deacon, 1999), economic growth and conflicts (e.g. Gonzales, 2004).

Weak institutions and institutional arrangements in developing countries

The next step in using NIE is to inquire why, where institutions exist, they have failed, and indeed did so predominantly in developing countries. The NIE literature helps in identifying a number of 'exogenous' factors that have contributed to the limited efficiency of institutions in developing countries. The first one relates to their historical evolution. The addition of developing countries' own 'improvements' to already complex administrative structures inherited from their colonial past increased their complexity and progressively took them out of the control of those operating them (Dixit, 2003). A second factor is the impact of global commodity and capital markets, as this impact reduces policy options for the state, disrupts the process of building institutions that govern the national economy and weakens the capacity of the state to mediate conflicts. Characteristics of developing countries, such as lack of human capital and suitable communication infrastructure to provide effective administrative, managerial and enforcement services, can also be considered responsible for the limited efficiency of institutions (Bardhan, 1997). Furthermore, the often limited human capacity within sectors can impede good sectoral management: the fisheries sector, one of the prime stakeholders in coastal zone management, typically lacks capacity to manage itself (Willmann *et al.*, 1999). Intertwined with these are other hindering factors such as opportunistic behaviour and plural motivations, which indirectly relate to the common agency problem.

The example of brackish-water shrimp aquaculture in India

Kurien's (1999) description of the 'State and Shrimp' situation in India is an eloquent

account of the 'boom and bust' of coastal aquaculture activities, which had been long practised extensively in tidal-based systems 'surrounded by a regime of overlapping rights for the fish farmers and the communities surrounding farms' (Kurien, 1999, p. 241). The inadequate institutions contributed to the decline of the shrimp industry more than had viruses, cyclones or excessive pollution. Effects of these could not be prevented, or contained, because 'suitable rules and regulations did not exist or the authorities did not have the means or the political clout to enforce them' (Dehadrai, Deputy Director General of the Ministry of Agriculture in NABARD, 1994, quoted in Kurien, 1999). The chronology of events in the development of the shrimp industry in southern Indian states (Karnataka, Andhra Pradesh, Tamil Nadu, Kerala) is reported here as in Kurien's case, with emphasis on the characteristics of institutional failure.

Justification for developing shrimp culture

The official reason for promotion of shrimp farming was based on a simple and logical deduction: 'shrimp harvests from nature [have] remained more or less stagnant. Thus it is logically concluded that the culture [of shrimp] is the only alternative for augmenting export production of shrimp' (MPEDA, 1992: p. 1, cited in Kurien, 1999). *Links with NIE concepts:* Practised in tidal zones, property or access rights were initially ill-defined but did not constitute a problem given the extensive nature of the activity. However, the sectoral decision to increase yields was made based on inadequate information to assess market variables and future trends. Yet, under the pressure of global economic liberalization and the opening of India to foreign investors, this decision was not questioned because of the influence of personal/corporate interests, power forces and the impact of global commodity and capital markets on the state's capacity to mediate conflicts (Bardhan, 1997). Potential for the emergence of interdependencies arising from shrimp production in isolation from other resource uses and economic activities was not considered.

Government actions to promote the activity

The government enacted a lease policy of government lands. Although priority for a lease had been traditionally given to poor fishermen at a very low price, the price of land rents to private entrepreneurs also remained derisively low. In addition to the quick issuance of licences for new aquaculture units, the government heavily subsidized start-up activities and provided investors with financial incentives. However, small-scale shrimp farmers were denied all forms of government support on the grounds that their land tenure for aquaculture was not secure. In 1991, a Coastal Zone Regulation Notification was passed as an attempt to regulate coastal developments. However, the rules of the Notification were 'complex and sometimes unclear, as if the government did not want to compromise all economic activities' (van Houtte-Sabbatucci, 1999). *Links with NIE concepts:* Through the leasing of lands under its ownership, the government contributed to the distortion of land market values at the expense of disadvantaged groups, without benefiting itself from revenues of leased lands. This allocation of land was, however, open only to entrepreneurs entering the shrimp business and subject to minimum requirements (4 ha for small entrepreneurs, 40 ha for progressive entrepreneurs), automatically excluding subsistence activities. Although it resulted in a form of property rights for commercial shrimp-farming activities, small-scale shrimp farming and traditional fishing remained unregulated by formal access rights to both land and water. The Coastal Zone Regulation Notification suffered from an information bias as its implementation was subject to interpretation. This left the credibility of the institution, as well as its commitment to applying the regulation, open to question.

Corporate power

Corporate shrimp farming grew rapidly. In comparison with small producers, large corporations had well-defined property rights (through government land leases). This posi-

tion of strength allowed them to lease more land or encroach if necessary. They seized open-access lands such as beaches, grazing areas and mangroves at the expense of communities of fisherfolks who disproportionately bore the impacts of shrimp businesses (depletion of fishing grounds through mangrove destruction and trawling for larvae, direct interference with fishing activities because of increased water turbidity, loss of traditional access rights to fishing grounds, contamination of drinking water sources, ICSE, 1999). *Links with NIE concepts:* the dominant position of corporations increased their bargaining power to the point where they overtook the role of the institution in place: the government. They nevertheless did not replace it. Entrepreneurs' opportunistic behaviour and disregard of the impact of interdependencies resulting from shrimp activities increased tensions between the two interest groups.

The 1996 crisis

Virus attacks, combined with cyclones and excessive pollution generated by shrimp operations, resulted in a drop in production levels equal to those before the activity took off (1990–1991). The response to why the state did not regulate the industry was quoted at the outset of this section: its lack of capacity and political will to apply and enforce rules. This led the judiciary to come to the forefront of the crisis to enforce the laws that existed and recognize the voice of those whose livelihoods had been negatively affected. *Links with NIE concepts:* although enforcement was within the remit of the executive and legislative arms of the state, they could not be activated because of the progressive accumulation of institutional failures that led to the collapse of the industry.

The Supreme Court intervention

A case was put before the Supreme Court of India questioning the 'right of corporate entities to inflict both direct and indirect threats to life and livelihood of the coastal communities, by being unconcerned about the uni-

directional externalities which they impose in the course of their business activities' (Kurien, 1999, p. 248). The Supreme Court Judgement (11 December 1996) ordered the demolition of all farms set up within the Coastal Zone Regulation and ordered the creation of the Aquaculture Authority of India in 1997, whose primary objective was to regulate shrimp farming. *Links with NIE concepts:* the establishment of the Aquaculture Authority of India was a positive step forward. However, the sustainability of an institution established as a response to a crisis has difficulties linked to the lingering of power forces and conflicting interest groups (Dixit, 2003). This may explain why, despite some improvements in the situation, the Aquaculture Authority of India is still struggling and requires a mix of policy measures such as strengthening of licensing rules, effective enforcement, judicious use of economic incentives and increased monitoring of environmental and social impacts (Hein, 2002). Bhat and Bhatta (2004), in their study of optimal land allocation for shrimp or crops following various government interventions (including the 1991 Coastal Zone Regulation and the 1996 Supreme Court order), showed that the current legal framework did not adequately address off-site effects of shrimp farms on coastal resources, on-site self-pollution and, more importantly, equity concerns of crop farmers and water users.

Neiland *et al.* (1999) pointed out that the lack of independent analysis of the factors affecting production strategies (i.e. inadequate information) reflected the polarization of viewpoints over the roles of different stakeholders in the shrimp industry. To overcome this polarization, these authors suggested the participation of all stakeholders in a policy formulation process geared towards the achievement of a common goal: the sustainability of the activity, now widely agreed upon and promoted through best management practices (BMPs). The following section takes a closer look at how institutions and their arrangements could be developed or strengthened, based on the NIE framework, before the Indian case study is re-explored in the light of these observations.

Decentralization, Devolution and Institutional Strengthening for Improved Integrated Coastal Planning and Development

Decentralization and devolution as institutional processes

Decentralization and devolution of management competencies and responsibilities stem from the increasing emphasis given to participation and representation in planning processes. Decentralization, the transfer of decision-making and financial responsibilities from a central authority (the state) to lower levels of government, has been motivated by two arguments. The first is increased efficiency as a central state authority usually lacks capacity to implement policies and programmes that reflect people's real needs and preferences. The second is improved governance through enhancement of accountability and monitoring of government officials and decision-makers (Jütting *et al.*, 2004). In the context of conflict, decentralization not only deflects tension away from the source of the conflict but also reduces the power of central bureaucracies (Bardhan, 1997). Devolution is a related reform but involves the transfer of rights and responsibilities to user groups at the local level.

These organizations are accountable to their membership (the resource users) but do not represent others in the community, or the society at large (Ribot, 1999). The relation between decentralization and devolution in the context of coastal resources is schematically shown in Fig. 20.1.

However, from the perspective of NIE, the willingness to decentralize and devolve responsibilities is a political process influenced by the costs of negotiating and implementing agreements, coping with information asymmetries and making commitments credible. Reforms must 'alter or adapt institutions and organizations in the desired direction: to do this successfully, they must anticipate and make provision of the transaction costs that inevitably arise in the operation of the new or modified procedures' (Dixit, 2003).

Requirements for successful institutional strengthening in the coastal zone

Human resources development and institutional strengthening are two prerequisites for integrated planning, at all levels (Willmann *et al.*, 1999). However, to examine the reasons linked to institutional failure, a number of additional factors deserve attention. They are

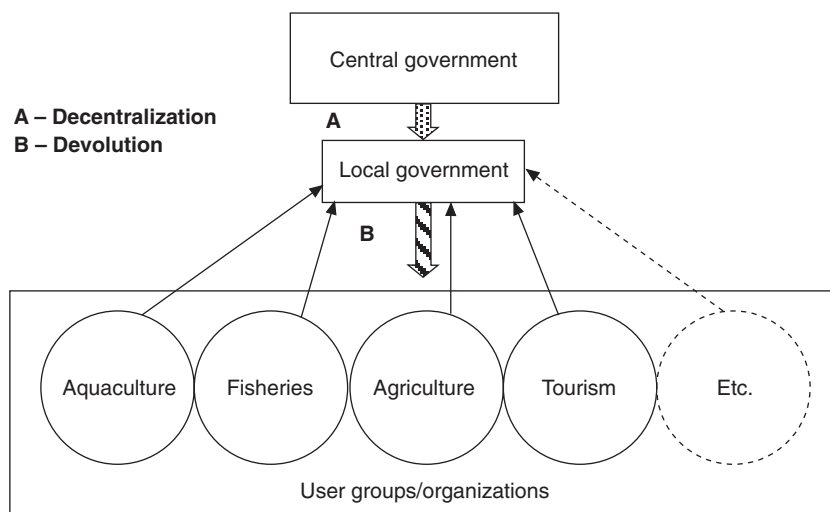


Fig. 20.1. Decentralization and devolution in relation to coastal resource management.

placed in the contexts of decentralization and devolution.

In the context of decentralization

TIMING AND TIME FACTOR Since socially beneficial reforms may not benefit from activation in a post-crisis situation, decentralization as a normative reform should be 'opportunistic', that is, initiated whenever openings and opportunities appear (Dixit, 2003). Implementation of coastal management initiatives takes time as it requires awareness raising and capacity building. The importance of this time factor was illustrated in a case study in the Philippines (Courtney *et al.*, 2002), in which more than a decade of efforts in building local government capacity was necessary to achieve the intended result of delivering coastal resource management as a basic service.⁷

ADAPTIVE AND COORDINATED NEW INSTITUTIONAL ARRANGEMENTS FOR RESOURCE MANAGEMENT To address constraints linked to weak incentives and the problem of common agency, a form of organizational reform achieved through reallocation and grouping of complementary tasks may be a promising approach (Dixit, 2003). In regional coastal development, a regional authority would be responsible for all projects and development initiatives falling within its geographic area of responsibility. Multisectoral integration can bring together and help coordination among agencies with a stake in coastal management to work together towards mutually agreed-upon goals. Structural integration, whereby an entirely new institutional structure with its own rules is created and is responsible for all development and policies linked to coastal use, can be an alternative (Scialabba, 1998). Although suggested in the context of coastal resource management in Tanzania (Masalu, 2000), the latter tends to be more difficult to put into practice given the protective attitude of ministries with regard to their power base and funding.

VISIBILITY, CREDIBILITY AND FLEXIBILITY OF NEW INSTITUTIONAL ARRANGEMENTS Visible mechanisms are necessary to ensure that the sacrifices required by large-scale adjustment programmes are equitably shared (Bardhan, 1997). The credibility of institutions is also paramount: institutional solutions will not work unless they are supported by reputational considerations, that is, they have been put in place through a widely recognized and supported, democratic and balanced process. The general principle of superiority of flexible rules over inflexible ones has to be balanced with arbitrary discretion. Although flexibility is required to respond to specific circumstances, the way in which it is applied has to be announced in advance and adhered to *ex post* (Dixit, 2003), dictating transparency and accountability as prerequisites.

BUILT-IN INSTITUTIONAL MECHANISMS FOR CONFLICT RESOLUTION Negative impacts of large-scale development projects could be lessened by the establishment of mechanisms through which grievances of those negatively affected or displaced could be voiced and given adequate weight and recognition in project evaluation and direction (Bardhan, 1997).

IMPROVED INFORMATION AND COMMUNICATION CHANNELS Because institutions often rely on incomplete and asymmetric information, improved negotiation outcomes could be achieved if more information, in both quantity and quality, were collected and equally shared (Dixit, 2003).

In the context of devolution

COLLECTIVE ACTION AND SOCIAL CAPITAL As relationships and networks, formal and informal, information flows, agreements, etc., have gained attention, in particular in relation to traditional management of common property resources, Paavola and Adger (2002) argue that social capital should be an

⁷ This time requirement may also explain why we are only starting to find concrete results of the achievements of integrated management in coastal areas reported in the literature.

integral part of the NIE approach to the environment. Social capital and institutions are intimately linked: the latter will condition the capacity of social groups to act collectively (Woolcock and Narayan, 2000). Reciprocally, collective action takes place within an institutional framework where choices are made according to specific decision rules (Olson, 1971). This implies that institutions that respect and enhance all forms of social capital are necessary to foster successful collective action. Traditional management rules of environmental resources such as fisheries are a manifestation of social capital (Berkes *et al.*, 2000). ‘New generation cooperative’ models that address the weaknesses of traditional cooperatives by strengthening the assignment of property rights to their individual members and by reducing the incentives for opportunistic behaviour have been advocated by Cook and Iliopoulos (2000).

CAPACITY BUILDING The assumption that sufficient local knowledge exists for managing resources sustainably, upon which many participatory management approaches are founded, is not always verified (Meinzen-Dick and Knox, 1999). For this reason, capacity building of the smallest units, that is, user groups such as fishers’ cooperatives, aquaculture operators’ associations, etc., is required so that their interests can be adequately represented in decision-making regarding resource allocation and management, thereby ensuring the likelihood of success of devolution programmes.

Policy reforms towards decentralization and devolution of resource management should occur concomitantly. Mechanisms to link user groups with local government authorities (thin feedback arrows in Fig. 20.1) should be established to avoid overlap of competencies and powers, and resurgence of conflicts. This implies that capacity needs to be strengthened on both sides: first building capacity in the user groups, that is, in a manner that can be seen as ‘sectoral’, to ensure that those groups base their activities on good-quality information and are adequately represented in decision-making

processes at local government levels. The second step is to build capacity at the level of local government authorities to increase their capacity for dealing with the multiple interests generated by devolution initiatives and for managing coastal resources in a more integrated way. Thus, sectoral capacity building can have a role to play in making decentralization and devolution succeed when addressing coastal zone users’ concerns.

Indian shrimp aquaculture case study revisited

Current institutions and their arrangements to deal with shrimp and coastal development in India, as schematically represented in Fig. 20.2, are now re-examined in the light of the above considerations.

The lack of an integrated approach on behalf of agencies and their respective arrangements dealing with shrimp development in isolation from coastal management, including protection, is evident (represented by the bold horizontal line dividing Fig. 20.2). Three main central agencies, often with overlapping mandates but no regulatory capacity, had been established by the government prior to the creation of the Aquaculture Authority of India: (i) the Marine Products Export Development Authority (MPEDA), an autonomous body under the Ministry of Commerce, in 1972; (ii) the Brackish-water Fish Farmers’ Development Agencies (BFDAs) set up during the Seventh Plan Period (1985–1990) in coastal states and union territories to provide technical, financial and extension support to shrimp farmers; and (iii) the Central Institute of Brackish-water Aquaculture (CIBA), a fully fledged research institute, in 1987. Established in 1997, the Aquaculture Authority of India was indeed an attempt to create a cross-sectoral agency with regulatory powers. However, mandates and responsibilities of existing agencies were not modified accordingly and all pursued their work independently. This has been exemplified by the release of multiple guidelines for

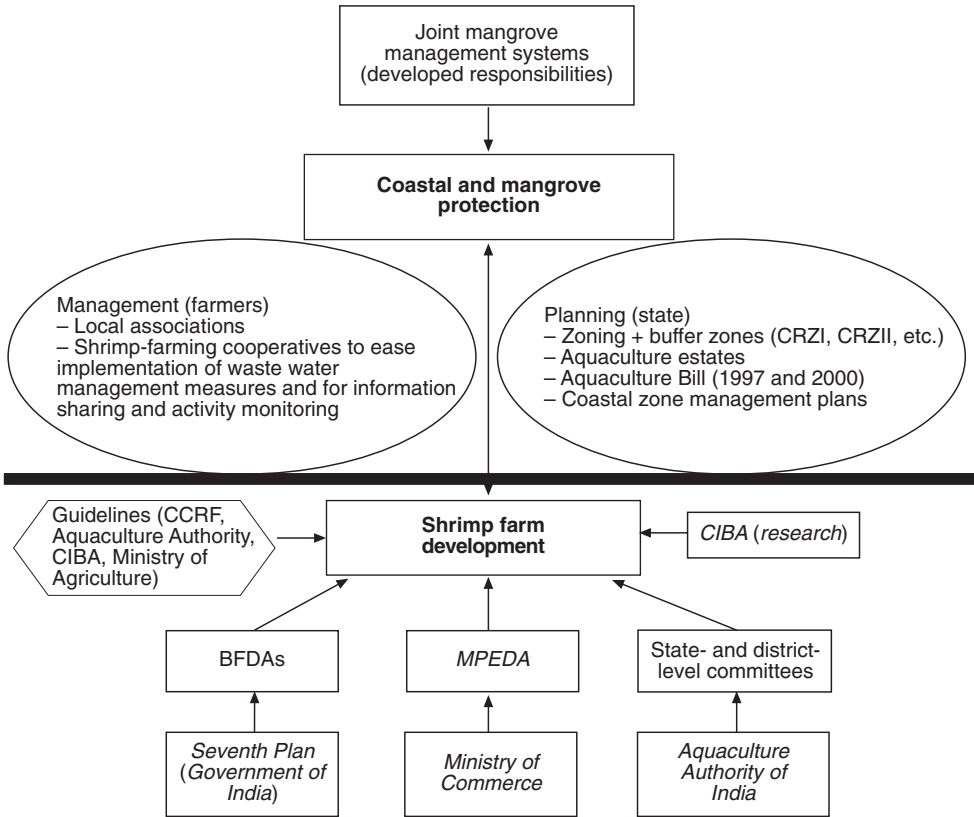


Fig. 20.2. Schematic representation of current institutional environment and arrangements influencing and regulating the planning and management of shrimp farms and coasts in India. In italics are centralized agencies. Rectangular boxes indicate institutional arrangements and agencies created to support the development of shrimp farming, whereas the hexagonal box denotes more specific guidelines (which can be assumed here to be the institutional ‘environment’) formulated to guide the development of the activity.

improved farm management.⁸ In addition, to facilitate the implementation of its Rules and Procedures for issuing licences for shrimp farms, the Aquaculture Authority constituted state- and district-level committees to appraise licence applications (prior to a final decision for issuance by the Aquaculture Authority). The ovals in Fig. 20.2 show measures taken after the shrimp

crisis and currently suggested to influence both shrimp management and coastal protection by the above-mentioned agencies. Zoning was a concrete mitigation measure proposed in the coastal states and union territories’ Coastal Zone Management Plans submitted to the central government and Ministry of Environment and Forests. These resulted in the categorization of four Coastal

⁸ ‘Guidelines for adopting improved technology for increasing production and productivity in traditional and improved traditional systems of shrimp farming’ and ‘Guidelines for setting up of effluent treatment system in shrimp farms’ by the Aquaculture Authority; guidelines to develop eco-friendly and economically viable culture technologies for greater productivity of fish, shellfish and other aquatic organisms in brackish-water areas by the CIBA; ‘Guidelines for classification, use and lease of brackish-water lands’ and ‘Guidelines for sustainable development and management of brackish-water aquaculture’ by the Ministry of Agriculture.

Regulation Zones of varying environmental sensitivity (CRZ I, CRZ II, etc.), in which restricted levels of development were allowed. Yet, this measure, although welcomed by environmental groups, has been only partially respected by state governments that fully supported commercial shrimp activities (Halim, 2004), and has been further threatened by the submission of the Aquaculture Authority Bill, first in 1997, then again in 2000, permitting the by-passing of farm-siting regulations.

In the Environmental Impact Assessment Report it submitted to the Supreme Court in support of the adoption of the Aquaculture Authority Bill, the Aquaculture Authority (2001) suggested several measures for promotion of the sustainable development of shrimp farming along Indian coastlines. These again included zoning for different activities and the establishment of buffer zones between shrimp farms to prevent salinization of soil and aquifers and to limit pollution. It was also suggested that states consider setting up 'aquaculture estates' in areas suitable for shrimp farming and where supporting infrastructure (roads and electricity) was already in place. Only small provisions were made, however, for farmers in the plan of action: they were encouraged to form local associations and organize themselves in shrimp cooperatives to address their production constraints. The formation of 'aqua-clubs' in Andhra Pradesh and Tamil Nadu was a significant step in this direction (Yadava, 2002). Although the provision of technical and extension support was recommended, it was nevertheless recognized that the capacity to do so by both the Aquaculture Authority and the BFDAs was limited. This illustrates two shortcomings: one linked to the fact that the decentralized agencies remained as fragmented as their central counterparts, and the other linked to the disassociation between local shrimp farmers' groups and local government structures, even if decentralized, as farmers' increased duties and responsibilities with regard to the implementation of sustainable farm management practices were not

matched by capacity enhancement or by legal recognition of their rights.

Regarding mangrove protection, interesting initiatives have been made with the development of 'Joint Mangrove Management' systems (JMM), implemented by State Forest Departments and a research foundation, in Tamil Nadu, Andhra Pradesh and Orissa (M.S. Swaminathan Research Foundation, 2004). The success of these community-based mechanisms has relied on the capacity of a decentralized management scheme to make the necessary provisions for communities to assume full responsibility for the management and protection of their resources, and in particular to design and implement their own and shared system of rule enforcement (the *Thengapali*).

The overall system could be improved in the following manner. First, the Aquaculture Authority could be maintained as it has regulatory powers, but its responsibility could be expanded to encompass the mandates of other central agencies such as CIBA and MPEDA to reduce the problem of multiple agents.⁹ Addressing environmental concerns such as mangrove protection would also be part of the new, re-defined responsibilities of the Aquaculture Authority. Articles 9 (aquaculture development) and 10 (integration of fisheries into coastal development) of the FAO Code of Conduct for Responsible Fisheries could be used as an all-encompassing guideline for the work of the Aquaculture Authority. Second, at a decentralized level, existing structures, such as the state- and district-level committees dealing with shrimp farm licences and BFDAs in their role of training and financial support providers, could be maintained but should be placed under the direct jurisdiction of the Aquaculture Authority, with the same legal power. In this process, environmental interests would also be represented at the local level. Third, the link between the decentralized form of Aquaculture Authority and shrimp farmers' associations (small-scale and/or commercial), Joint Mangrove Management committees and other local groups such as shrimp larvae collectors,

⁹ This could imply the disappearance of these two agencies.

fisherfolks, etc., could be strengthened by involving *Gram panchayats*, which are village-level self-governance bodies. These could be made responsible for village-level implementation of the policies and measures developed by the decentralized authority (Bhatta and Bhat, 1998).

The next two key issues to examine are capacity building and enforcement of the rules. Sectoral capacity building of individual associations (or the 'smallest unit') was suggested earlier as a stepping stone towards improved participation and representation of common interests in planning processes. It should also be carried out at the level of the decentralized authority to increase its capacity for dealing with multiple interests and to ensure that the rights and duties of individual groups are formally recognized and enforced. Enforcement of rules should also take place at the level of individual associations, possibly along the lines of an arrangement similar to the *Thengapali* system developed under the umbrella of the Joint Mangrove Management scheme. Enforcement mechanisms are likely to be more easily accepted and respected if designed and implemented by beneficiaries themselves. Gibson *et al.* (2005) showed that it matters less which rules a community group or, at a higher level, a district, state or even a country adopts than how well it monitors or enforces the rules set, as long as those rules are clear and credible while remaining flexible enough.

Despite these suggestions, the limitations of decentralization should nevertheless not be forgotten. First, governments' willingness to partake in decentralization processes is a *sine qua non* condition for reforms to take place and power to be transferred to lower units. Secondly, decentralization and devolution will be pointless if they are not carried out in parallel with capacity building, as underlined above. Thirdly, the positive impacts of decentralization have yet to be demonstrated. Improper decentralization processes may potentially result in the 'explosion' of a central problem into a myriad of smaller, yet similar, problems. Finally, devolution is incomplete if people are given duties without being given rights. The allo-

cation of these rights, as we have seen, is an ethical, economic and ultimately institutional issue.

Concluding Remarks

Although Westmacott (2002) concluded that conflicts in tropical coastal areas should be at the focus of management measures, this chapter has tried to demonstrate that conflicts were the mere outcome of institutional failure, or stemmed from the simple lack of suitable institutions (environment and arrangements) for dealing with coastal zone issues. Consequently, it is suggested that emphasis on integrated coastal management should shift from conflict resolution to the design and building of suitable institutions where they are absent, or strengthening of those that already exist. Some integrated, participatory coastal management initiatives have failed to examine both environmental and conflict issues because 'new' institutional arrangements put in place to deal with these issues mirrored, through power games, incompatible specific interests and high transaction costs – the sectoral management approaches that existed before.

The consideration of New Institutional Economics principles has allowed pinpointing of the precise causes for the conflicts that still prevail in environmentally sensitive areas such as coastal zones. If the root of conflicts is human competition for natural resources, failure of institutional arrangements is the reason why they remain unresolved.

Decentralization and devolution of management responsibilities are key reform processes, but can only be successfully achieved if the institutions created or remodelled from this process meet some basic requirements to ensure their good 'functioning'. An immediate step for future action is capacity building. In the light of today's experiences with coastal management and the fact that planning capacity is often limited in developing countries within disciplines (be it for the fisheries, aquaculture or agricultural sector), it is suggested that strengthening the capacity of individual sectors is a more efficient and practical move in

the direction of the broader goal of integrated management. Strengthening the capacity of local governments to deal with and coordinate those multiple interests in the elaboration of integrated management plans should be the next step. Of course, these efforts should not preclude ongoing work related to improvements in information quality and communication channels, governance and accountability, along with current efforts to better represent the interests of direct and indirect users in decision-making processes regarding coastal resource allocation.

The issuance of property rights on common resources and their acceptance remains a sticky issue, in particular when the problem is disaggregated between *use* rights (access and withdrawal) and *control* rights (management, exclusion, alienation) (Schlager and

Ostrom, 1992). Although they are being advocated in the context of capture fisheries where they have potential to revert overexploitation of fish stocks (Hannesson, 2004), they may be more difficult to implement in the case of coastal resources because of the multiplicity, divergence and competition of all interests at stake. In addition, such rights are worthless if they are not, or cannot be, enforced.

Finally, outcomes of decentralization and devolution processes, in terms of efficiency of resource use and conflict mitigation and the long-term financial, as well as environmental, sustainability of coastal resource management systems, need further documenting. The issue of time, however, is not to be dismissed: it takes time to make decisions, time to accept them, and even more time to see and measure their impacts.

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