

# Law Enforcement, Compliance, and Fisheries Sustainability



Shekar Bose

**Abstract** This chapter highlights the fact that achieving sustainability in fisheries is a challenging task as it is influenced by the values, interests, incentives and attitudes of the actors involved, as well as institutional arrangements, among others. This chapter provides strategic insights into the issues and challenges pertaining to fisheries sustainability at the local and regional level. Evidence from the literature review confirms that the conservation and effective management of fisheries resources is unlikely, particularly when (1) fisheries resources are shared by countries with no clear ownership, (2) the enforcement of fisheries regulations is weak that results in noncompliance behavior, and (3) institutional arrangements and performance are not at their best level. The highlighted issues are a global phenomenon. In this context, a practical option to achieve sustainability in fisheries within territorial waters and beyond is to create cooperative arrangements which are transparent and operational in their true sense. The principal message of this chapter is that to achieve fisheries sustainability, “business as usual” is not an option, as the issue of fisheries law enforcement, noncompliance, and sustainability will continue to be the national, regional and international policy agenda in the future.

**Keywords** Fisheries sustainability · Enforcement and compliance · Territorial waters · Shared resources · Cooperative management

## 1 Introduction

The socioeconomic importance and cultural significance of oceans and seas are well-recognized (WB 2017). From a regional perspective, the recent adoption of the “Blue Economy Declaration” at the first Indian Ocean Rim Association (IORA)

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S. Bose (✉)

Department of Natural Resource Economics, College of Agricultural and Marine Sciences, Sultan Qaboos University, Al-Khod, Sultanate of Oman

Brisbane, QLD, Australia

e-mail: [shekar.bose@hotmail.com](mailto:shekar.bose@hotmail.com)

Ministerial Blue Economy Conference (BEC) held in Mauritius on 2–3 September 2015 affirms such recognition. The Declaration aims to harness oceans and maritime resources to drive economic growth, job creation, and innovation without undermining the long-term sustainability of natural resources and the protection of ocean environment (<http://www.iora.net/en/priorities-focus-areas/blue-economy>). The largest small-scale and artisanal fisheries involving multitudes of small boats and fishing gears characterize the Indian Ocean Region (IOR) (Anon 2001; Jabado and Spaet 2017). Detailed synopsis on the regulatory arrangements and the status of fisheries resources in the IOR can be found in De Young (2006). Fisheries of the Indian Ocean and the adjacent waters such as the Arabian Sea (the northwestern part of the Indian Ocean and located between the Arabian Peninsula and the Indian subcontinent) are at the core of the Blue Economy initiative as it provides food and nutritional security to millions of people and greatly contribute to the livelihoods of coastal communities in the region (Bose et al. 2010; Bose 2016; Meaden et al. 2016). This particular contribution of fisheries stimulates economic and political interests of the local, regional, and global actors involved in the sector. However, to safeguard such interests in fisheries resources and to ensure the future flow of benefits from fisheries resources to local and regional communities, practitioners and policy-makers must effectively address the key issues identified from the literature such as overfishing, overinvestment, illegal fishing, weak governance and enforcement, and organizational inertia, as a matter of priority as they are incompatible with sustainable management of fisheries resources of the territorial waters and beyond. The effort to initiate effective management and conservation programs necessitates that the divergent cultural and economic interests of the local, regional, and international stakeholders must be addressed in an efficient manner.

Keeping the above context in mind, the main objective of this chapter is to emphasize that the path to sustainability in fisheries is challenging as it is complicated by, among others, the values, socioeconomic and cultural interests, incentives, attitudes, and beliefs of the actors involved in the sector as well as institutional arrangements. Drawing on the work of scholars in the field, this chapter also highlights that the absence of resource ownership, lack of incentives, low enforcement capacity, extent of noncompliance, weak governance and institutional inertia are causing challenges toward the sustainable management of the local and regional fisheries. Under these circumstances it is advocated that cooperative management guided by the existing international binding instruments is an essential step towards achieving sustainability in fisheries of territorial waters and beyond.

## 2 Context

Fisheries management is a goal-oriented, objective-driven and integrated process that evolves over time (Barber and Taylor 1990). However, common access to resources and the presence of jurisdictional externalities associated specifically with transboundary fish stocks make the application of private property rights challenging and the management of fisheries resources difficult (Brown 2000). In

addition, in the absence of such sovereignty over resources, the individual interests take precedence over the joint interests and result in a fierce competition among participants engaged in the harvesting of fisheries resources. These circumstances generate symptoms of overfishing and overcapitalization and threaten fisheries sustainability in the long run (Acheson 1989). The overexploited status of fisheries with regard to certain species in the region has been echoed in both regional and local studies (RECOFI 2010; IOTC 2017; Al-Balushi et al. 2016; Alabsi and Komatsu 2014). In addition, the growing demand for fish as expected (Delgado et al. 2003) will exert added pressure on capture fisheries resources and exacerbate the overexploited status of the fisheries.

The importance of oceans and the concern over the overexploited status of marine resources and their sustainability are reflected in various international pronouncements. For example, the 1982 United Nations Convention on the Law of the Sea (UNCLOS) and the blueprint called “Agenda 21” provide a legal framework that recognizes the rights and responsibilities of coastal States in relation to the conservation and management of resources within the exclusive economic zone (EEZ) and high seas (UN 1982; UNCED 1992). The concerted efforts of the international community to promote sustainable development have led to the development and adoption of Agenda 21, the action plan adopted by 169 countries at the 1992 United Nations Conference on Environment and Development (UNCED), and Chap. 17 of “Agenda 21” is devoted to the active promotion of interdependence, integrated management, and sustainable development (UNCED 1992). It also highlights the protection of marine environment and greater cooperation among stakeholders. These are supplemented by the 1995 UN Fish Stocks Agreement that also provides a legal framework in relation to the conservation and management of “shared fish stocks” (UN 1995). In addition, some nonbinding instruments are also in place to address fisheries sustainability. For example, in 1995 the United Nations Food and Agriculture Organization (FAO) introduced the voluntary Code of Conduct for Responsible Fisheries (the FAO Code of Conduct hereafter) to address non-sustainable practices in fisheries (FAO 1995). These strategic initiatives by the international community formed a basis for national, regional, and global action and cooperative management for achieving long-term sustainability of all areas of the oceans and their resources (Rice 2014; Lodge 2007; Xue 2006; Houghton et al. 2004; Sydnes 2002 to name a few).

Being at the core of the national development agenda of various countries (Thorpe et al. 2005), the fisheries sector has been the subject of public pressure to fulfill the macroeconomic goals such as economic development, food security, employment generation, and the like (Bose 2016). Bose (2016) argued that while the fisheries sector should play a vital role in achieving the food and nutrition security goal, it should not be at expense of the sustainability of the fish stocks. It must be emphasized that the short-term economic gain driven by self-interest should be avoided to ensure the long-term flow of benefits from the sector. For instance, Goodland and Daly (1996) stated that the state of overfishing has been the limiting factor for economic development. Therefore, an effective institution and a sound strategic approach are required to maintain a balance between conservation and

development in the sector and thereby sustain fisheries contributions to national and regional economies.

### 3 The Sustainability Mantra in Fisheries Management

Since 1987, the concept of sustainable development has become a catchphrase for international, regional, and national programs and corresponding policy undertakings for all sectors. The World Commission on Environment and Development (WECD) offered a definition of sustainable development as: “Humanity has the ability to make development sustainable—to ensure that it meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The concept of sustainable development does imply limits—not absolute limits but limitations imposed by the present state of technology and social organization on environmental resources and by the ability of the biosphere to absorb the effects of human activities” (UN 1987, 15).

Following this concept, sustainable use of fisheries resources is a widely adopted goal for fisheries management in both developed and developing countries. However, achievement of a such goal has been met with some challenges that include natural variability, scientific uncertainty, lack of enforcement and compliance, user conflicts and structural uncertainty, among others. A considerable time has been spent by the practitioners from various disciplines to define the term sustainable development and identify its operational contents (Hilborn et al. 2015). Although the term is variously defined in the existing literature, certain elements such as environmental protection, interdependency of the environment and economy, welfare of the future generation and emphasis on the precautionary approach convey commonality in the existing views (Al-Masroori and Bose 2011; Hilborn et al. 2015). The concept of sustainable development is multidimensional—as it embraces four major interrelated dimensions, namely, ecological, economic, social, and institutional sustainability—and temporal in nature (Goodland and Daly 1996; Charles 2001). As the dimensions are interconnected, a lack of progress in one dimension will undermine the overall progress toward sustainability. Therefore, this multidimensional feature not only demands for the adoption of a holistic approach of identifying, evaluating, mitigating, and predicting biological and environmental impacts of any development pursuits but also calls for greater synergies between environment, institution, and development. At the World Summit on Sustainable Development (WSSD), held in Johannesburg in 2002, specific roles and approaches for the Regional Commissions were considered and were reaffirmed at the Rio+20 with the purpose of not only enhancing interlinkages among the social, economic, and environmental dimensions of sustainable development but also implementing the post-2015 development agenda (UN 2014).

Furthermore, the effort to build on the Millennium Development Goals (MDGs) the Sustainable Development Goals adopted in September 2015 by the United Nations General Assembly incorporated other elements such as people, prosperity,

dignity, partnership, justice, equity, fairness, and participation. Inclusion of these elements added to the operational complexity of the concept of sustainable development (Griggs et al. 2013). For further details on the chronological development of the global process of sustainable development and on the identification of options and strategies for future action see, among others, Rice (2014) and UN (2014). Al-Masroori and Bose (2011) and Rice (2014) discussed the linkage between fisheries sustainability and sustainable development.

The assessment and monitoring of sustainability have not only become integral components of a fisheries management process but have also become imperative to making a well-convincing argument for receiving public expenditure allocation and to fulfill accountability requirements of the government agencies. For instance, following the FAO Code of Conduct for Responsible Fisheries (1995), assessment of sustainability was emphasized in the regional guidelines developed by the Southeast Asian Fisheries Development Center (SEAFDEC) for fisheries sectors in the region (SEAFDEC 2003). In a developing country context, Al-Masroori (2008) and Al-Masroori and Bose (2014) have demonstrated how to conduct such an assessment task using an appropriate sustainable development framework and perform investigation of possible management scenarios derived from the practical change in management schemes using sensitivity analysis.

#### **4 Enforcement and Compliance as a Precondition for Fisheries Sustainability**

Under the sustainable development framework, the effectiveness of fisheries law enforcement is one of the regulatory preconditions for the alleviation of the problem of overfishing associated with common-pool resources like fisheries (Sethi and Somanathan 1996). Although fisheries management has made considerable progress since the inception of UNCLOS 1982, there are still some concerning issues such as habitat degradation, illegal fishing (Grafton et al. 2007; Pitcher et al. 2002; Bodin and Österblom 2013), overfishing and overcapacity, weak governance, and poor management especially in the context of small-scale fisheries in developing countries (Purcell and Pomeroy 2015; Pomeroy 2012; Salas et al. 2007) interfering with the progress toward sustainability across national, regional, and international frontiers (Cullis-Suzuki and Pauly 2010; Jabado and Spaet 2017).

The FAO Code of Conduct raises the issue of illegal, unregulated and unreported (IUU) fishing in world fisheries as a matter of serious concern as IUU fishing undermines efforts to conserve and manage fish stocks in all capture fisheries (FAO 1995). It is rather a global phenomenon, not a local issue anymore (WB 2004; HSTF 2006; Crees-Morris et al. 2006; Österblom et al. 2010; Bodin and Österblom 2013). In a regional context, the 2016 IUU list of vessels displayed by the Indian Ocean Tuna Commission (IOTC) shows the extent of IUU activities in the region ([www.iotc.org/vessels](http://www.iotc.org/vessels)). The concerns of illegal fishing, noncompliance

behavior, and weak enforcement are also echoed in the studies of the Arabian Sea countries such as Oman (Al-Subhi et al. 2013; Bose et al. 2017) and Yemen (Alabsi and Komatsu 2014). When confronted with IUU fishing, national and regional fisheries management organizations can fail to achieve management goals. Doubts are also raised regarding the effectiveness of international and regional institutions in successfully managing high seas resources (Sydnes 2002; Williams 2005; Hilborn 2007; Lodge 2007; Rochette and Billé 2008; Cullis-Suzuki and Pauly 2010; Bodin and Österblom 2013; Jabado and Spaet 2017). This situation not only seriously impairs efforts to rebuild stocks that have already been depleted but also leads to socioeconomic loss in the short and long term and generates negative effects on food security and environmental condition (Pitcher et al. 2002). This situation also undermines the morale of legitimate fishers and, perhaps more importantly, encourages them to disregard the rules.

The extent of noncompliance—measured by the degree of divergence of fishers' actual behavior from the prescribed one which is generally determined by a set of regulations—is routinely used as a performance measure for regulatory effectiveness (Cox 2009). Because of the anticipated positive association between the level of compliance and the effectiveness of regulations, *ceteris paribus*, policy-makers and the international community have been putting their efforts into designing cost-effective strategies to enhance both domestic and international fisheries compliance within a nation's territorial waters and beyond, respectively.

It must be recognized that there is no single strategy that could address IUU fishing effectively. An integrated approach is recommended at the international, regional, and national levels (WB 2004; HSTF 2006; Österblom et al. 2010; Bodin and Österblom 2013). For example, the International Plan of Action-IUU (IPOA-IUU) was adopted in 2001 by the Committee on Fisheries (COFI) of the Food and Agriculture Organization of the United Nations (FAO), and it called on States to develop and implement National Plan of Actions (NPOAs) by June 2004. In response to this call, Oman has developed the National Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (NPOA-IUU) fishing (MAF 2006). The IPOA-IUU document contains general measures targeted at all States (i.e., flag States, coastal States, and port States). The IPOA-IUU calls on coastal States to implement measures such as ensuring all vessels are registered; logbook requirements; controls on transshipment; effective monitoring, control and surveillance (MCS); cooperation and exchange of information with other States; the regional fisheries management organizations (RFMOs); and the Regional Commission for Fisheries (RECOFI) to prevent, deter, and eliminate IUU fishing in jurisdictional waters.

## 5 Basics of Fisheries Enforcement and Compliance

As stated earlier, effectiveness of fisheries enforcement and the minimization of noncompliance are necessary conditions for fisheries sustainability. Such an unequivocal role of fisheries law enforcement has been well-documented and

reflected in fisheries management endeavors of coastal States such as Oman (Al-Subhi et al. 2013). Existing literature portrayed two mainstream views on fisheries law enforcement and compliance (Gezelius 2007; Bose et al. 2017; Al-Subhi et al. 2013). While one is guided by the notion of instrumental rationality that promotes a coercive approach to the enforcement of laws and accordingly emphasizes the deterrence of rule evasion through the imposition of sanctions by legal authorities (Becker 1968), the other view is guided by social norms (Elster 1989) and promotes normative actions that are shared and enforced by members of the community for collective interests (Gezelius 2007).

While the deviance behavior under the deterrence approach is explained in terms of the economic magnitude of expected payoff and accordingly recommended the level of punishment (Becker 1968, Stigler 1970), the proponents of the other approach base their arguments on the socio-psychological theories and believe that other factors such as personal morality, social norms and informal social sanctions, perceptions of fairness, and legitimacy of institutions (i.e., rules) are also important in explaining compliance behavior (Sutinen and Kuperan 1999; Garoupa 1997; Murphy 2005; Nielsen 2003; Jentoft 2000). Parsons (1993) pointed out that the former approach treats regulations as enforced directives for which compliance is coerced. On the other hand, the other approach treats compliance as a shared commitment (May 2004).

Other noneconomic factors such as communication (Jentoft 2004), mutual trust (de Vos and van Tatenhove 2011), and conflict (Charles 1992; Bennett et al. 2001) also have an important role to influence compliance motivations (Al-Subhi et al. 2013). It is suggested in the literature that inadequate consultation—a common allegation associated with the “command and control” approach to fisheries management—leads to inefficient decisions and generates high level of dissatisfaction among fishers. These in turn lead to noncompliance with regulations (OECD 1997). There is an expectation that effective communication and increased level of mutual trust will promote affirmative motivations which strengthen voluntary compliance (Gunningham and Sinclair 2009; May 2004).

The deterrent view is mainly driven by two interdependent assumptions. First, fishers, as economic agents, are motivated by “self-regarding desires.” Second, their actions conform to the model of “rationality” (Pettit 1993). From the decision theory perspective, it implies that in the case of a risky choice (such as illegal fishing), fishers possess transitive preferences, and they are assumed to maximize expected utility (Edwards 1954; Becker 1968). Becker (1968) argued that the occurrence and intensity of offenses are directly proportional to the net profits that are likely to be earned from those offenses. Following the classical economic theory of crime, the success of any law enforcement program—measured by the overall probability of conviction—depends upon the joint probability of following basic elements: (a) the ability to detect violations when they occur, (b) the ability to apprehend the violators, and (c) the choice of types and magnitudes of punishments used as deterrents (Parsons 1993; Furlong 1991). This joint probability condition indicates that a low probability of one element in the chain will lower the overall probability of conviction, which, in turn, reduces the strength of the enforcement process. Deutsch (1988)

emphasized that the capabilities of economic agents are not fixed and in the noncompliance situation, opportunity costs for each party are very high. Therefore, attention should be given to minimize the strong motives for distrusting each other. Deutsch (1988) argued that the deterrent approach encourages irrational behavior from both parties involved as management authorities may act irrationally to increase the credibility of threats.

Furthermore, the optimal enforcement is influenced by the cost constraint (Sutinen and Andersen 1985). For example, Bose et al. (2017) observed that the total funds (excluding salaries of permanent staff) allocated in 2011 for fisheries monitoring, control and surveillance (MCS) activities in Oman was about 587,330 Omani Rial (OMR) (1 OMR = USD 2.60). Although the deterrent approach is relatively common in fisheries, several studies advocate a hybrid approach in asserting fishers' compliance behavior in both commercial and small-scale fisheries contexts (Kuperan and Sutinen 1998; Bose and Crees-Morris 2009, Nielsen and Mathiesen 2003; Al-Subhi et al. 2013; Bose et al. 2017). Given these serious impediments such as enforcement capabilities, budget constraints, legal structure and process, mutual distrust, and user group conflicts to attaining optimal enforcement, it is essential to search for alternative and complementary course of actions to promote compliance which is one of the preconditions for both local and international fisheries sustainability (Al-Subhi et al. 2013; Cullis-Suzuki and Pauly 2010; Bodin and Österblom 2013, to name a few).

## 6 The Path to Sustainability: A Review and Strategic Choice

It is evident from the above discussion that the existing state of affairs in relation to fisheries sustainability within exclusive coastal State jurisdiction and beyond are not rational, and to safeguarding stocks from overfishing, it requires cooperative arrangements among parties involved. This convincing approach is not only recommended by the international binding instruments such as the 1982 UN Convention on the Law of the Sea and the 1995 UN Fish Stocks Agreement but is also highlighted by the practitioners in the field (Crothers and Nelson 2006; Noble 2000; Al-Subhi et al. 2013; Al-Balushi et al. 2016). The binding instruments set forth clear obligations for the coastal States to cooperate or negotiate with respect to the conservation and management of all categories of shared stocks. In the context of "shared resources" management, the worldwide experiences suggest that the cooperation both at the primary (i.e., joint scientific research) and the secondary (i.e., joint management) levels is essential (Miller and Munro 2002; Munro 2009). The collaborative arrangements were also promoted in the FAO Workshop on the "Status of Shared Fisheries Resources in the Northern Arabian Sea-Iran (Islamic Republic of), Oman and Pakistan," held in Muscat, Oman, December 13–15, 2010 (FAO 2011), and in the eighth meeting of the Working Group on Fisheries Management under the



Regional Commission for Fisheries (RECOFI) held in Egypt, December 8–10, 2014 (RECOFI 2014).

It is worth mentioning that regional fisheries management organizations (RFMOs) were established to initiate multilateral cooperative arrangements among coastal States and distant water fishing nations (DWFNs) to solve crisis of high seas fisheries issues related to overfishing and IUU fishing (Williams 2005; Lodge 2007; Österblom et al. 2010; Bodin and Österblom 2013). For a detail historical overview on the structure, functions, and evaluation of international fisheries institutions see, among others, Sydnes (2002), Swan (2004), Williams (2005) and Cullis-Suzuki and Pauly (2010). Although the creation of such regional organizations has provided opportunities for all relevant actors to collectively arrive at more effective solutions to fisheries crisis, the record of this initiative is rather mixed. Leaving efforts at coordination aside, these organizations have been criticized with regard to ineffective governance arrangements (Crothers and Nelson 2006; Lodge 2007); disparity between organizational intent and action (Cullis-Suzuki and Pauly 2010); failure to deal adequately with protection and conservation of fish stocks (Cullis-Suzuki and Pauly 2010), IUU fishing, and the “free-rider” problem (Lodge 2007); failure to develop appropriate right-based management approaches (Williams 2005); failure to address heterogeneity in interests and capacities of member States (Williams 2005); failure to promote more integrated global approaches to enforcing fisheries regulations (Williams 2005; HSTF 2006); and lack of accountability (Cullis-Suzuki and Pauly 2010). Another issue of concern is the lack of transparency and appropriate arrangements in the distribution of benefits derived from the sector (Bose 2016). If it is perceived by the actors that economic benefits generated from the sector are not appropriately redirected to the development of the sector and the existing distribution patterns of benefits is often not fair and equitable, then it would impair the effectiveness of the institutional arrangements (Noble 2000). It must be emphasized that the successes and failures of the institutional arrangements at the local as well as regional levels suggest lessons for revitalizing institutional arrangements and designing future management measures to address issues that are incompatible with fisheries sustainability.

In this situation one should not be surprised to see that developing countries are willing to implement new international fisheries instrument. Reflecting on the geographical coverage and functional responsibilities of the existing regional organizations such as IOTC and RECOFI, the options for forming a new regional fisheries management organization (RFMO) for the Arabian Sea for management of particular marine areas, fisheries, and related marine environmental affairs were also considered in the FAO Workshop on the “Status of Shared Fisheries Resources in the Northern Arabian Sea-Iran (Islamic Republic of), Oman and Pakistan,” held in Muscat, Oman, December 13–15, 2010 (FAO 2011).

In domestic fisheries context, co-management and community-based managements are often promoted as an alternative to enforcement (Noble 2000) and a way to improving participatory democracy and compliance (Jentoft et al. 1998; Jentoft 2000). In an effort to encourage consensus building as promoted by the sustainable development paradigm (Lélé 1991), Gezelius (2007) emphasized the conditions for

rational consensus between the management authority and fishers through effective communication. The same consensus building approach is also applicable to multi-lateral arrangement. The following agreements, among others, (1) the cooperative management arrangements on fisheries between China Seas States (Xue 2005), (2) the establishment of the Caribbean Regional Fisheries Mechanism (CFRM) to enhance regional cooperation in the sustainable management of the shared resources (Haughton et al. 2004), (3) agreements negotiated for the salmon fishery in Canada (Robinson 2001) and (4) the bilateral agreements between Norway and Russia regarding cod fisheries in the Barents Sea (Stokke 2001) are referred to in the literature in support of such consensus building approach.

In the context of high seas fisheries compliance, the 1993 Compliance Agreement—an integral part of the Fisheries Code of Conduct—outlines measures to promote compliance with international conservation and management measures by fishing vessels on the high seas. Referring to the Donut Hole Convention on the Conservation and Management of Pollock Resources in the Central Bering Sea, Carr (1997) emphasized some innovative mechanisms for ensuring compliance with, and enforcement of, international conservation and management agreements for straddling and highly migratory fish stocks. The case of kingfish in the GCC region can also be used as a case in point. Bose and Al-Balushi (2010) presented a cooperative management plan in the GCC workshop held in Muscat in February 2010 to encourage the development of a plan based on consensus. This effort led to the following concrete results. In September 3, 2014, the Ministry of Agriculture and Fisheries of Oman took a Ministerial Decision (MD No. 2014/230) for the conservation and management of kingfish which comprises various articles under which seasonal restrictions (August 15 to October 15), size limits (length should be greater than or equal to 65 cm FL, as proposed in the amended plan during the GCC workshop held in Muscat in February 2010), trade restrictions (trading of kingfish is not allowed during closed season unless the catch is registered with the authority during the fishing season), and restrictions on fishing gear and methods (length of the hanging rope should not be more than 2400 m, the depth of the net should not be greater than 10 m from the sea surface, mesh size should not be less than 95 mm, twine use should not be less than 1 mm) were stipulated (Al-Balushi et al. 2016).

Getz and Bergh (1992: 269) stated that “Scientists can calculate best estimates for stock abundance and optimal quotas corresponding to maximum yield or rent criteria, but the rational [*sic*] for implementing a particular management policy is often the outcome of complicated negotiations in the socio-political arena.” The use of negotiation techniques in fisheries decision-making is not uncommon. In Western Australia, Wright et al. (2000) prepared guidelines for addressing fisheries resource sharing issues in a cooperative manner and proposed the use of “mediation” as a technique for generating stakeholder-based management solutions. In this context, genuine negotiations with an attempt to change each other’s motives through a mutual campaign of awareness toward a mutual appreciation and adjustment of perceptions and preferences of all parties concerned should be attempted with utmost priority (Deutsch 1988). Crothers and Nelson (2006) proposed a governance

framework for high seas fisheries by introducing a new corporate structure with an independent environment standard setter to promote accountability in governance.

However, the success of any institutional arrangements will depend upon whether they can address the national differences in socioeconomic and political environments of natural resource management in the region. No management authorities and decision-makers need to be convinced that in the present-day environment, collective actions are the lifeblood of fisheries management at the local, regional, and global level. The question is not therefore about whether such institutional approaches are required but how to, among others, (1) implement effective governance arrangements to adequately address overfishing, IUU fishing, and free-rider problem, (2) remove organizational inertia that hinders necessary changes, (3) remove disparity between intent and action, (4) formulate the approach to discourage competition, (5) stimulate innovation that turns member countries' rivalry into opportunity, (6) address heterogeneity in interests and capacities of member States, and (7) promote collective action as a route to foster sustainable utilization of fisheries resources in the region. This process will increase the likelihood of mutually rewarding outcome and keep the unsustainable practices within the mutually agreed and scientifically robust bounds to safeguard the long-run sustainability of fisheries resources. In addition, to reduce the consequences of various forms of uncertainties such as scientific, structural, political, market-related, and behavioral documented in fisheries science and management literature (Ludwig et al. 1993; Charles 2001; Hoel 1998; Fulton et al. 2011), the implementation of a precautionary approach (Garcia 1994) and the design of appropriate biological and economic responses should be followed to hedge against and adapt to such uncertainties (Lauck et al. 1998; Hilborn 2007).

## 7 Concluding Remarks

Given the current status of fisheries within EEZ and beyond and considering the various positive benefits of cooperation, it is important to search for possible arrangements/options to create more responsible community attitudes toward resource use and rule compliance. Despite diversity among countries in the region in their resource endowments and cultural heritage, it is time to think about the relative merits of various joint programs to create a mutually beneficial regime. Negotiations over the design of the measures may be tough and intense—as interests differ among coastal States and between coastal States and DWFN—but the outcomes of such negotiations should not be resulted from a variety of compromises over issues such as overfishing, overcapitalization, and IUU fishing.

The IOR charter and the recommendations from the practitioners and policy-makers envisaged that cooperation and collective action is a way forward to achieve fisheries sustainability. Collective action is vital for promoting efficiency through effective governance that legitimizes the inherent process, innovation, and management activities, reduces risks and transaction costs, and encourages competitiveness.

The effective solutions to our common problems should be searched collectively and would depend on the ability of the institution to harness actor-specific skills and expertise and find innovative and operational solutions by engaging them rather than replacing them. The principal message of this chapter is that to achieve fisheries sustainability, “business as usual” is not a viable option, as the issue of fisheries law enforcement, noncompliance, and sustainability will continue to be the national, regional, and international policy agenda in the future.

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