Chapter 15
The Damage Schedule Approach

Andrew Song and Ratana Chuenpagdee

Abstract Illegal fishing is a problem widely observed in fisheries around the world and Lake Malawi is no exception. The long alleviation attempts of the central government of Malawi based on the strategy of enforcement and sanctions have proved largely ineffective leading to the persistence of this governability challenge. An alternate perspective is sought in this chapter by emphasizing people's fundamental notions such as values, images and principles. In order to better understand what they look like and how they may differ amongst stakeholders, the damage schedule was employed. The results display a significant disparity in what governors and resource users regard as a value priority, with the former group judging conservation to be a top concern, while the latter strongly favors the advancement of economic wellbeing. This finding demonstrates socio-economic diversity in people's underlying views about the fishery, which provides partial but important insights towards the alleviation of illegal fishing in Lake Malawi. Such diversity poses a certain limit to the governability of this fisheries system, and must be made aware and genuinely acted upon by all those involved in governance.

Keywords Governability • Diversity • Values-images-principles • Illegal fishing • Lake Malawi • Damage schedules

Introduction

Illegal fishing and non-compliance of regulations pose serious problems for fisheries around the world. They are governance issues that have wide implications at all fishery scales, from an inland artisanal fishery in a developing country to a large

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industrial-scale one in the high seas. Manifested in various ways, such as poaching, use of destructive fishing methods and zoning violation, the overall effect of illegal fishing and non-compliance behaviors threatens the integrity and health of the ecosystem, as well as the socio-economic basis of those who depend on the resources.

The study of compliance had an initial point of departure in the criminal behavior of economic individuals. Inspired by the work of Adam Smith and Jeremy Bentham, who reasoned that individuals in pursuit of economic self-interest could yield criminal behavior necessitating deterrence to reduce crime, there followed numerous studies that linked crime and economic circumstances (Hønneland 1999). In the 1960s, a formal theoretical framework that views criminals as any other individuals attempting to maximize personal utility was established by Becker's (1968) economic analysis. Stemming from this neoclassical thinking that underpins the economic models of regulatory compliance, the prevailing framework has regarded fishers as utility maximizing individuals driven by self-interest whose decision to engage in illegal fishing is primarily determined by expected payoffs and penalties (cf. Sutinen and Gauvin 1989; Sutinen et al. 1990; Furlong 1991). Thus, the overarching policy response to this issue has been the promotion of deterrence by enhancing enforcement and posing threats of severe sanctions or expensive fines (Hatcher et al. 2000). Such deterrent policies do, however, have severe limitations given that they are costly and difficult to implement (Hatcher et al. 2000). They are also coercive in nature, which can engender bitterness or hostility towards government authority (Sutinen and Kuperan 1999).

Contrary to what the neoclassical deterrence model prescribes, in reality, the probability of getting caught is usually low and the penalties are generally not large relative to the illegal gains (Kuperan and Sutinen 1998). In addition, considerable empirical evidence has shown that a large majority of fishers normally complies with regulations despite such shortcomings (Sutinen and Gauvin 1989; Sutinen et al. 1990). The examples of high compliance despite relatively low enforcement and deterrence are also commonly found outside the fisheries sector, such as the low rate of tax evasion (Elster 1990). Realizing that the neoclassical perspective alone is not adequate to explain the compliance behavior, several studies have embarked on accounting for this 'irrationality' by incorporating other factors into the compliance framework (Kuperan and Sutinen 1998; Sutinen and Kuperan 1999; Charles et al. 1999; Hatcher et al. 2000). These other factors include legitimacy, morality and socialization, which are emphasized through social norms and the social capital of small groups, for instance, in common property theory (Ostrom 1990).

Tyler (1990) introduces the terminology of 'instrumental perspective' and 'normative perspective' in distinguishing between these two streams of arguments. The instrumental perspective is synonymous with Becker's (1968) framework that assumes individuals as rational agents driven by self-interest and responding to incentives and sanctions. The normative perspective, on the other hand, emphasizes that individuals are influenced by what is just, fair, appropriate and morally right. These are in a sense 'priceless' and thus defy a benefit-cost calculation. It involves human values such as being moderate as well as environmental values such as existence value. This perspective also accounts for people acting as a matter of principle,

even in the face of imminent inconveniences or opportunities to seek easy rewards. In addition, certain images held by people may direct their action in a manner that others with different 'ways of seeing the world' may not easily comprehend. Hence, broadly speaking, values, images and principles form an intricate part of this so-called normative perspective. The arising consensus in the fisheries circle, as well as elsewhere, is that the normative perspective plays a crucial role in influencing compliance behavior among fishers, and therefore theoretical elaboration, as well as policy intervention, should be shifted towards paying greater attention to this aspect.

Diversity in Values, Images and Principles

Despite much deliberation on the topic of illegal fishing and compliance and on ways to improve the situation, its widespread nature is an ever-persistent threat (e.g. FAO 2001; Flewwelling et al. 2002; Crawford et al. 2004; Hauck and Kroese 2006; Sumaila et al. 2006; Agnew et al. 2009). Why is illegal fishing so difficult to eradicate or at least manage at a level that is not detrimental to ecological integrity and social functioning? It becomes an especially acute conundrum if violating fishers are typically shown to understand the rationale (and good intentions) of the restrictive fisheries regulations, and are generally aware of its long-term consequences.

We submit that the issue of illegal fishing can exemplify the component of *diversity* inherent in fisheries governance as argued by, and emphasized in, interactive governance (Kooiman et al. 2005). More specifically, a socio-economic sub-system represented by various individuals and groups involved in a particular fishery setting can be characterized as having a diverse set of interests and ways of doing things that may complicate the issue of illegal fishing by putting people in a number of unique circumstances. On a deeper level, this implies that people's underlying normative and cognitive concepts, such as values, images and principles, are at the root of the diversity that makes compliance a thorny undertaking. Values tend to be incommensurable, implying the impossibility of comparison (Kooiman and Jentoft 2005). 'Hard choices' in fisheries arise from this value-ridden characteristic forcing any decisions to be painful and controversial. In this regard, Kooiman and Jentoft (2009) argue for the importance of making governance values as coherent and explicit as possible for the betterment of governability. Images and principles also frequently compete and contrast with each other, creating an antagonistic reality. Hence, as values, images and principles guide, shape and inspire people's decisions and actions, including fishing practice and strategy, illegal fishing may be imbued with different connotations, meanings and rationales among the various stakeholder groups. A pertinent example of this is when a person values both ecosystem conservation and secure livelihoods. These two particular values are certainly not mutually exclusive and can be promoted in accordance with one another. A value conflict could arise, however, when in pursuit of securing livelihoods, a fisher forgoes

ecological conservation by catching fish beyond the legal guidelines. This would represent a weaker standing of conservation value in light of the more desirable conception of secure livelihoods. Likewise, an image of poverty in his/her household may pose more painful/fearful than the image of the barren sea. Such configurations would affect his/her principles so that one's action and decisions are first and foremost guided by the principles involving the fulfillment of human welfare and economic viability rather than those concerning nature/resource conservation. Acknowledging the diverse ways people's values, images and principles interact to produce different behavior and decisions, it may be of benefit to examine them and gain a more deep-seated understanding of why illegal fishing takes place and persist despite the various deterrence measures.

Illegal Fishing as a Governability Challenge

We reason that the varying views that exist about the compliance of fishing rules, as well as the real social and environmental consequences that may ensue from illegal fishing, all lead to governability challenges. Governability here can be rephrased as the capacity of fisheries as a whole to self-organize and maintain themselves with due consideration of the inherent and constructed qualities embedded in nature and society. Referred to in simpler terms as a propensity for successful governance (Kooiman 2008), implications for governability have several dimensions in the context of illegal fishing. First, the depletion of fish stocks and deterioration of ecosystem services pose a rather obvious difficulty in maintaining the governability of an overall fisheries system. This is because it results in the reduction of integrity and self-generating capacity of the ecosystem. Overfishing, combined with much suspected illegal fishing by foreign fleets in the Grand Banks, has led to the northern cod collapse in the waters around Newfoundland. The recovery has yet to fully occur, while the abundance of large cod prey such as snow crab and shrimp has greatly increased (Bundy and Fanning 2005). This complex trophic shift has made governing the fishery in the region a more contentious affair and thus less governable. Looking at the social aspect, illegal fishing contributes to a loss of social cohesion and sense of cooperation, as well as a stimulation of hyper-competitive spirit, hostility and even physical confrontation. These factors make governance an extremely delicate and tense subject, and reduce the ways in which governing can reach its potential. In the Gulf of California, for instance, poaching by outsiders was shown to jeopardize otherwise well-observed local cooperation. Leading to a rapid cascading effect on fisheries resources and locally-designed rule compliance, accountability was eroded among fishers and the fishery quickly became a free-for-all (Cudney-Bueno and Basurto 2009). Thirdly, people's varying views pose a challenge to the upkeep of governability in and of themselves. Incommensurable values may act as a limit to how governable a fishery can be (Jentoft 2007). If governors and those-being-governed hold highly polarized or otherwise vastly different views

of an issue such as rule compliance or which fishery projects to give priority, ensuring stakeholder compromise and cooperation becomes a greater challenge. The point is that illegal fishing may proliferate or is difficult to eradicate due to the existence of diverse and conflicting stakeholder views encompassing value, images and principles. Understanding this diversity in values, images and principles would thus become an important step towards alleviating illegal fishing and increasing the level of compliance. Insights that stem from this alternate, but fundamental, viewpoint are welcomed and may contribute to finding ways to improve governability.

The following section proceeds with the aim of discussing how the diversity in stakeholder views can be systematically examined. By bringing in the case study accounts of illegal fishing in Lake Malawi as an empirical context, we highlight one of the tools, the 'damage schedule,' that can be employed to elicit people's judgments and preferences as a way to explore their underlying values, images and principles.

Studying Values, Images and Principles

Elicitation of values, images and principles does not present itself as a clear-cut exercise. There are a variety of ways to understand what people value and how much they do so based on one's approach and schools of thought. Satterfield and Kalof (2005) remind us of a useful way of categorizing values – axiomatic vs. relativistic traditions. An axiomatic approach operates on the premise that certain values are better, more important and intellectually defensible than others. Typically expert-driven from the fields of ethics, philosophy and ecological economics, the values under this tradition are formulated based on argument (e.g. Kellert 1993; Rolston 1994) and/or measurement (e.g. Costanza et al. 1998). The relativistic approach assumes that there are no right or wrong values, only different ones. Abiding by the principle of 'value-neutral,' researchers in this tradition rely on expressed preferences to monitor or elicit public opinion and conduct valuation exercises for policy and management purposes. This chapter focuses on the relativistic approach due to its heavy influences on policy and management process through the collection of stakeholder judgments and preferences (Satterfield and Kalof 2005).

Implicitly aligning with the relativistic tradition, Gregory (1999) offers a useful list of tools for identifying (environmental) values. Among the tools that comprise the category of economic valuations are travel costs – assigning economic value to natural resources based on visitation; hedonic pricing – capturing values in the prices of marketed goods; contingent valuation – willingness-to-pay and willingness-to-accept; and damage schedules – estimates of the relative seriousness of adverse impacts on natural resources. Non-economic valuation that involves non-monetary expressed preferences includes attitudinal and opinion surveys, and small-group discussions such as focus groups.

Damage Schedules

The survey method highlighted in this chapter is the damage schedule (Gregory et al. 1996; Chuenpagdee et al. 2001). A damage schedule is envisioned as a set of policy instruments similar to payments and sanctions that could be used to discourage damaging activities and compensate for resource losses. It collects public judgments on the relative importance of resource losses or the relative harmfulness of certain activities causing the losses. The assessed preferences or judgments are presented in the form of an interval ranking scale, which could work as a non-monetary indicator of the severity of resource losses or the impacts of the damaging activities. The result can aid policy makers in developing appropriate policy strategies to prevent certain activities, create a compensation scheme for resource damage, and deter incidents such as accidental oil spills and discharge pollution. Further, the developed damage schedules offer policy makers a platform to involve local communities in the management of resources and directly incorporate their inputs in policy design, since the schedules are based on the knowledge of resource users and on people's preferences and judgments about resources and their importance, as well as those of scientists and managers.

The damage schedule approach has been applied to several fisheries and coastal related studies over the years. An earlier application was to examine coastal development issues surrounding shrimp farming and tourism in Southern Thailand (Chuenpagdee et al. 2001). Chuenpagdee et al. (2002) surveyed community members in Mexico to reveal local judgments about the severity of damages to coastal habitats and the impact of activities that may cause the damages. A more elaborated set was developed to assess the relative severity of collateral impacts of the fishing gears commonly used in the United States (Chuenpagdee et al. 2003). Environmental damages in the urban coastal setting of Singapore were the subject of the study by Quah et al. (2006), who then used the resulting scale to derive willingness-to-accept compensation amounts for relinquishing top environmental concerns. As demonstrated by these applications, this quantitative survey method affords flexibility in design that, we believe, will allow modifications to be made to get at one's underlying values and principles.

Paired Comparison

The damage schedule relies on the use of paired comparison, which is a simple method frequently used to attain a ranking scale. Its basic unit is the comparison of two objects, and the comparison is presented to one or more judges. The term 'object' is used to cover what is being compared such as treatment or stimuli, while judges mean survey respondents (David 1988). This method has proven useful in situations where subjective judgments may play a role in people's evaluation, such as in taste tasting, personnel evaluation, or social values. It is particularly applicable in situations "when it is impossible or impractical to make relevant measurements

in order to decide which of the two objects is preferable" (David 1988, 1). Initially employed in psychometry (e.g. Thurstone 1927), its fields of application have more recently been expanded to include, among others, acoustics, animal ecology, economics, epidemiology, food science and sports. Furthermore, its use in eliciting public preferences and judgments in an environmental study setting has been justified by a number of studies that employed this method with a similar intention (Peterson and Brown 1998; Rutherford et al. 1998; Chuenpagdee et al. 2001; Rudd 2001; Wattage and Mardle 2005; Quah et al. 2006). The method begins by establishing a set of objects under the theme of a particular study, whether it is resource losses, damaging activities or community programs. The objects are presented in pairs to each respondent, who then is asked to make a choice between them. This will continue one after another until all possible pairs are exhausted. Standard notation denotes N as the total number of objects, while the total number of respondents are denoted as k. For each respondent, the total number of all possible pairs for comparison is $N(N\text{-}1)/2$. Under normal circumstances, each object has the same probability of being selected as all objects are paired an equal number of times.

There are at least three key advantages of using paired comparisons. First, a fine judgment can be better achieved in a binary setting, especially when objects are deemed to have subtle differences. The usual difficulty that faces a simultaneous ordinal ranking of all N objects can be lessened. Secondly, the paired comparison method can be used to produce an interval scale in which the numerical differences between the objects have an arithmetic meaning. It shows the spread of the objects on a scale, and is useful in explaining the extent to which one object is preferred over others in numerical terms. The third advantage of the paired comparison exercise is that it is simple to conduct, and thus can be repeated or modified to accommodate changes in the systems that we are interested in. An obvious drawback of the approach is the limited number of objects that can be included in the comparison, at least in the complete design. When the number of pairs presented is too large, respondents may become fatigued and tend to believe that there are repetitive pairs, even if there were not.

Case Study: Southeast Arm Fishery in Lake Malawi

Like many fisheries around the world, illegal fishing is widespread in Lake Malawi. Towards the southeastern area called the Southeast Arm (SEA), illegal fishing is thought to contribute significantly to species decline, adding to existing concerns over stock depletion, as well as the loss of livelihood opportunities and sources of animal protein (Banda et al. 2005; Bulirani 2005). The concept of illegal fishing first became a topic of importance in Lake Malawi in the 1930s. British colonial conservationists, concerned with the lake's ecology and fish conservation, indignantly viewed traditional fishing methods, such as weirs and traps, as destructive and primitive. Determined to restrict these traditional practices, they introduced a series of early fishing regulations (Chirwa 1996). Through the establishment of the Department

of Fisheries (DoF) in 1946, deterrence through enforcement of regulations and the threat of sanctions continued to be the main form of policy response to illegal fishing in the decades that followed, persisting beyond independence from the colonial government in 1964. Despite fishers' prolonged acquaintance with the regulations (Hara 2001), however, the ineffectiveness of this approach was evident. The process was often treated with mistrust and disdain, and the ensuing violent confrontations with resource users not only proved to be dangerous, but also demoralizing for the government enforcement personnel (Hara 2006a). With the rising eminence of co-management regimes as a democratic and cost-effective way of achieving compliance, a participatory management initiative was put into practice in the SEA in the mid-1990s. Unfortunately, as Njaya (2007, 2008) and Hara (2006b) point out, the management initiative's implementation has been beseeched by several challenges, and it has only been marginally successful in raising the support of the fishing communities needed in order to resolve illegal fishing. There is a need for an alternative measure that has a different focus and that recognizes the limited availability of financial and human resources in management in order to better address the illegal fishing problem in the SEA and the growing concern for the conservation of the lake's ecosystem.

A multi-species and multi-gear small-scale fishery is the main form of fishing activity in the SEA to this date (Smith 1998; Ngochera 2001). It typically uses small vessels such as planked boats and dug-out canoes to operate gillnets, longlines and open-water seine nets called *chilimira*. Fishing is not only boat based, however. It can also be done on land through, for example, beach seining. Much of the catch is sold for cash income, signifying the commercial importance of the fishery.

There is a great diversity too in the stakeholders involved in the SEA fishery. Gear owners commonly refer to those who own fishing gear, but may not necessarily participate in fishing. Crewmembers, on the other hand, are those who provide manpower and technical know-how in the actual fishing operation. Fish processors and traders are also highly visible in fishing communities. They set up their operation near landing sites to ensure a steady supply of fish and maintain a close relationship with fishers. Though DoF holds the ultimate authority in overseeing fisheries matters, the Traditional Authority governs day-to-day fishing matters at the village level. The Traditional Authority is upheld by three hierarchical levels of traditional leaders – the chief, the group village head and the village head. Other relevant governing institutions include the Members of Parliaments that represent the area at the national level and the Commercial Fishermen's Association, which exists to represent the preferences and judgments of a handful, but powerful, large-scale fishing owners and operators.

Study Design for Elicitation of Judgments and Preferences

In the context of illegal fishing and the diverse group of stakeholders involved in the Lake Malawi fishery, this case study was designed to assess the extent to which fishery stakeholders value conservation through elicitation of judgments and preferences.

Table 15.1 Objects for each paired comparison set (in Set B, a value associated with each community program is shown in brackets)

Set A: Fishing activities
Catching juvenile fish
Fishing using mechanized gear
Fishing using gears that disturb lake bottom
Fishing in offshore deep water
Fishing using non-selective gear
Too many people fishing in one area
Fishing in spawning area
Set B: Community programs
Protect fish habitat and fish species (conservation)
Promote scientific research on lake fisheries ecosystem (precaution)
Provide micro-credit loans to expand fishing-related work (economic wellbeing)
Help reduce fish spoilage during catching and processing (frugality)
Promote small-scale community fish cage culture (innovation)
Ensure fishing access for local fishers and communities (social justice)
Provide ownership of resources to local communities (subsidiarity)

By examining how much they value conservation as it competes with other interests, we may acquire a deeper understanding of what motivates illegal fishing and find support for focusing on values, images and principles in dealing with illegal fishing.

Two sets of paired comparisons were developed, as listed in Table 15.1. In order to gauge the level of conservation awareness, one measures the judgment of respondents in relation to which fishing activities are more damaging to the fisheries resources in the SEA. We asked respondents "In your opinion, which of these two activities do you consider more damaging to the fishery resources in the SEA?" All of the objects can be deemed potentially damaging by the respondents, albeit with different degrees of severity. For instance, it may be entirely possible that one sees 'fishing using mechanized gear' just as damaging as 'catching juvenile fish' depending on his/her unique fishing circumstances. Although the question refers to opinion, it is acknowledged that the responses may reflect local, specialized knowledge of the respondents, not just opinions or preferences. The second set assesses respondents' preferences towards conservation-oriented community fisheries programs by asking the question: "If a program were to be implemented in your community, in your opinion, which of these two programs, A or B, do you prefer?" There are seven objects included in each set, giving a total number of 21 pairs per set. They represent site-specific fishing activities and the community programs that are relevant in the SEA. They were developed based on existing literature, including the fisheries regulation, direct observations during field visits, informal interviews with key informants, and the results of several rounds of pre-tests. The lists were also verified with a group of fishery managers in the SEA to ensure that these activities and programs indeed best reflect the concerns of the stakeholders in the region.

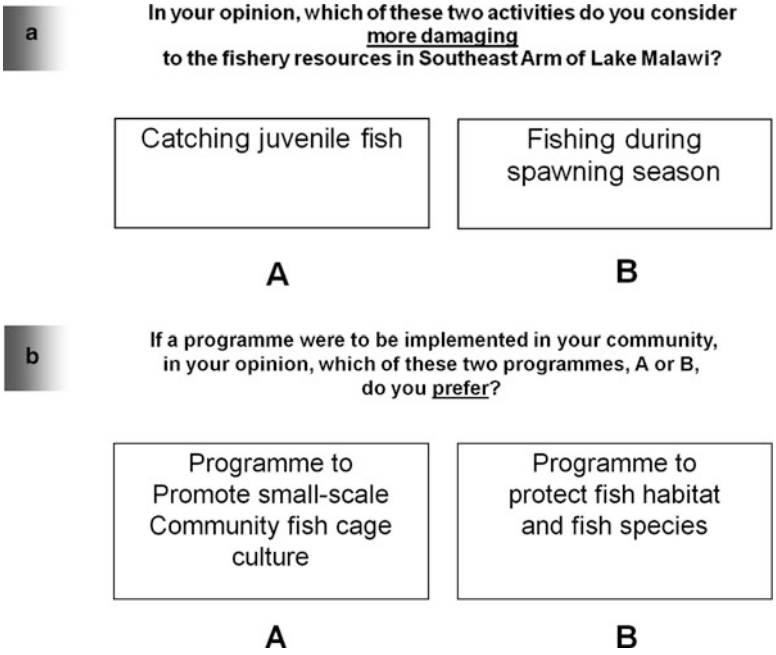

Fig. 15.1 Sample paired comparison questions drawn from (**a**) Set *A* and (**b**) Set *B*

Responses to the first set, Set A, produce a scale, from most damaging to least damaging fishing activity, on the basis of respondents' perceptions. It is an indication of their level of understanding about the lake's fisheries and ecosystems, and may enable voluntary engagement in conservation-oriented fishing practices. The assumption is that, for any principle to influence one's fishing decisions and behavior (both legal and illegal), s/he must first be equipped with sufficient understanding of which activities promote conservation and should thus be encouraged, and which activities jeopardize conservation and should therefore be made illegal. As shown in Table 15.1, the objects are void of any specific details. For example, there is no number indicating the degree of mechanization in 'fishing using mechanized gear', and any mention of a specific fishing gear is avoided. This was to minimize strategic voting of the respondents by basing the comparisons on the concept – or the *image* – of the fishing activities and not on the specifics that may conjure up certain attachments to their own fishing activities. An example of paired comparison used in Set A is displayed in Fig. 15.1a.

The second set, Set B, results in a scale that reveals the extent of respondents' inclination for fisheries conservation. Even if the stakeholders hold sufficient understanding on how to proceed with conservation, it is necessary to confirm that they do in fact value conservation. The set was designed such that two community programs that directly promote conservation are included in the choice pairs. 'Programme [sic] to protect fish habitat and fish species' is a scenario that has a

direct attachment to conservation, while 'programme [sic] to promote scientific research on lake fisheries ecosystem', which draws on the well-known precautionary principle, also deems conservation highly relevant. Valuing these over the other community programs, which may largely be driven by other interests and motivations that show little compatibility with the conservation objective, can be interpreted as a fair indication of their genuine inclination towards conservation. Each of the community programs has an associated value, which is suggested in brackets in Table 15.1. The programs are presented to the respondents in a hypothetical sense as something that could be implemented, but without the promise of implementation. This was to prevent immediate expectation from influencing their choices. An example of the paired comparison used in Set B is displayed in Fig. 15.1b.

Survey Information

The survey was directed at seven groups of respondents and involved multiple sites, as shown in Fig. 15.2. Active fishing villages on the eastern shore of the SEA were chosen to be the main location for surveying the resource-dependent groups, that is, gear owners, crew members, fish processors/traders and community members. This side of the water body is believed to yield better catch than the stock-depleted western shore (Njaya 2008). Also, due to its relative remoteness, coupled with the shortage of infrastructure and tourism development, fishing still remains a key economic activity supporting people's livelihoods on the eastern shore. To investigate any potential disparity that may arise from the east-west geographical distinction, two more resource-dependent groups, gear owners and crew members on the western shore, were added to the survey. Thus, together with the managers/scientists group, seven respondent groups were formed. The survey was conducted with the assistance of a local person, who is native to the area and, in addition to being proficient in English, has fluency in two of the most widely spoken local languages, Chichewa and Chiyao. The survey with the scientists/managers group, comprising of various government officials such as planners, researchers, statisticians, enforcement officers, lecturers, and also scientists from several nongovernmental organizations (NGOs) working in the field of fisheries, took place in various locations around the lake. These were conducted without the assistance of the local translator, because of their proficiency in the English language.

All 21 pairs from each set were included in the survey booklet, resulting in a total of 42 pairs. The sequential order of the pairs in the booklet and the left-right position of the two choices in each pair were both randomly generated to ensure the uniqueness of each booklet, as well as avoiding any possible order-related bias. Due to concerns about the availability and reliability of a census database, random sampling of respondents was not feasible. Instead, quota sampling was employed to obtain the total number of respondents, 144. Approximately 20 respondents were surveyed for each group. As shown in the demographic breakdown of the survey respondents (Table 15.2), only modest differences exist in the number of respondents, their average age and the average years of fishery experience. One may think that the small sample size of each

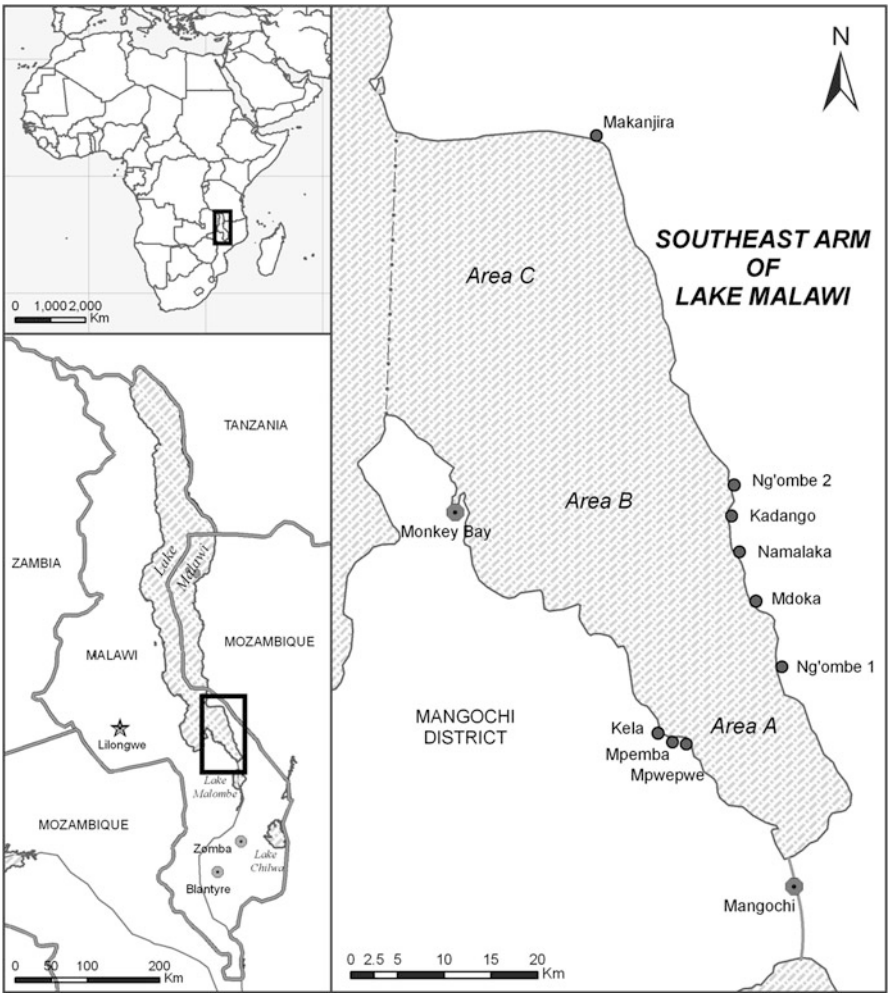

Fig. 15.2 Map of the Southeast Arm of Lake Malawi (Survey sites are shown as *dark circles*; *double circles* indicate town centres) (Source: Song 2009)

group could reduce the reliability of the results of this study. However, as other studies of similar methodologies and intent have shown (c.f. Chuenpagdee et al. 2003; Quah et al. 2006; Bose and Crees-Morris 2009), in-group consistency was quickly reached with the number of respondents obtained in the study. Thus, increasing the number of respondents would be of no pragmatic value from the view of both cost-effectiveness and time-efficiency (Bose and Crees-Morris 2009). Whenever possible, a one-on-one setting was preferred when conducting the survey in order to minimize any strategic bias that may arise from social pressure or fear of reprisal. Hence, most surveys were conducted in a quiet, sheltered environment in the absence of other community members. Each survey took an average of about 25 minutes to complete.

Table 15.2 Demographic information of survey respondents

	Gear owners (East)	Crew members (East)	Processors/ Traders	Community members	Gear owners (West)	Crew members (West)	Manager/ Scientists	Total
Total number of respondents	20	20	20	20	21	17	26	144
Male	20	20	7	8	19	17	21	112
Female	0	0	13	12	2	0	5	32
Age[a]	38	30	37	34	38	34	40	–
Years of fishery experience[a]	10	9	9	–	6	9	13	–
Years in education[a]	1	5	6	3	3	3	13+[b]	–

[a]Denotes average value

[b]Indicates tertiary education, which typically surpasses 13 years of schooling

Results

Figure 15.3 is a simplified version of a damage schedule that illustrates the rankings of conservation awareness and conservation value based on the results of the two paired comparison sets. According to the Kendall's tau rank correlation analysis ($p = 0.05$), the survey results revealed no significant difference among the respondent groups as to which fishing activities are more or less damaging to the fisheries resources in the SEA. Hence, the judged responses of all seven groups were combined into a single scale as shown in Fig. 15.3. 'Fishing in spawning area' was unanimously identified to be the most damaging practice with the normalized score of 82 out of 100. This was followed by 'fishing using gears that disturb lake bottom' and 'fishing using non-selective gear', which shared the identical score of 65. 'Catching juvenile fish' was the next most damaging activity. As for activities with moderate damage, 'too many fishers in one area' was deemed as damaging as 'fishing using mechanized gear'. With a score of 8, 'fishing in offshore deep water' was overwhelmingly judged to be the least damaging form of fishing activity.

Understanding the ecological impact of pertinent fishing activities forms an essential aspect of realizing fisheries conservation. Not only are the results attained here agreed on by all surveyed groups in the SEA fishery, they are also judged to be consistent with the commonly-held knowledge about fishing gears and their impacts in other fisheries worldwide. For instance, utmost attention on fishing in spawning areas observed in the SEA corresponds with the high emphasis placed on the role of marine reserves in enhancing spawning stocks and protecting juvenile production (Murawski et al. 2000; Manríquez and Castilla 2001). Also, the relatively severe damage from disturbing the lake bottom perceived by the respondents in the SEA is a contentious issue globally. with special regard given to bottom-trawling (Watling and Norse 1998; Chuenpagdee et al. 2003). Hence, the general correspondence of the survey result with prevailing ecological issues in global fisheries suggests that the stakeholder groups in the SEA hold a moderately high level of understanding of fisheries conservation.

Unlike the awareness portion, the survey results demonstrate the existence of a significant divergence of judgments and preferences between the resource-dependent groups and the manager/scientists group when it comes to the preference of fisheries-related programs. While the resource-dependent groups unequivocally preferred the program that provides micro-credit loans for the expansion of their fishing-related work, the same inclination was not found within the managers/scientists, who ranked the program near the bottom. The second notable difference between the two groups lies in the preference ranking of the program that provides ownership of resources to local communities, which was ranked relatively low for the resources-dependent groups compared to a high ranking among the managers/scientists. The third disparity concerns the program that helps reduce fish spoilage during catching and processing. This was by far the least preferred program in the eyes of resource-dependent groups with the score of 7, and in stark contrast to the score provided by the managers/scientists, 50. Two programs that have direct relevance for

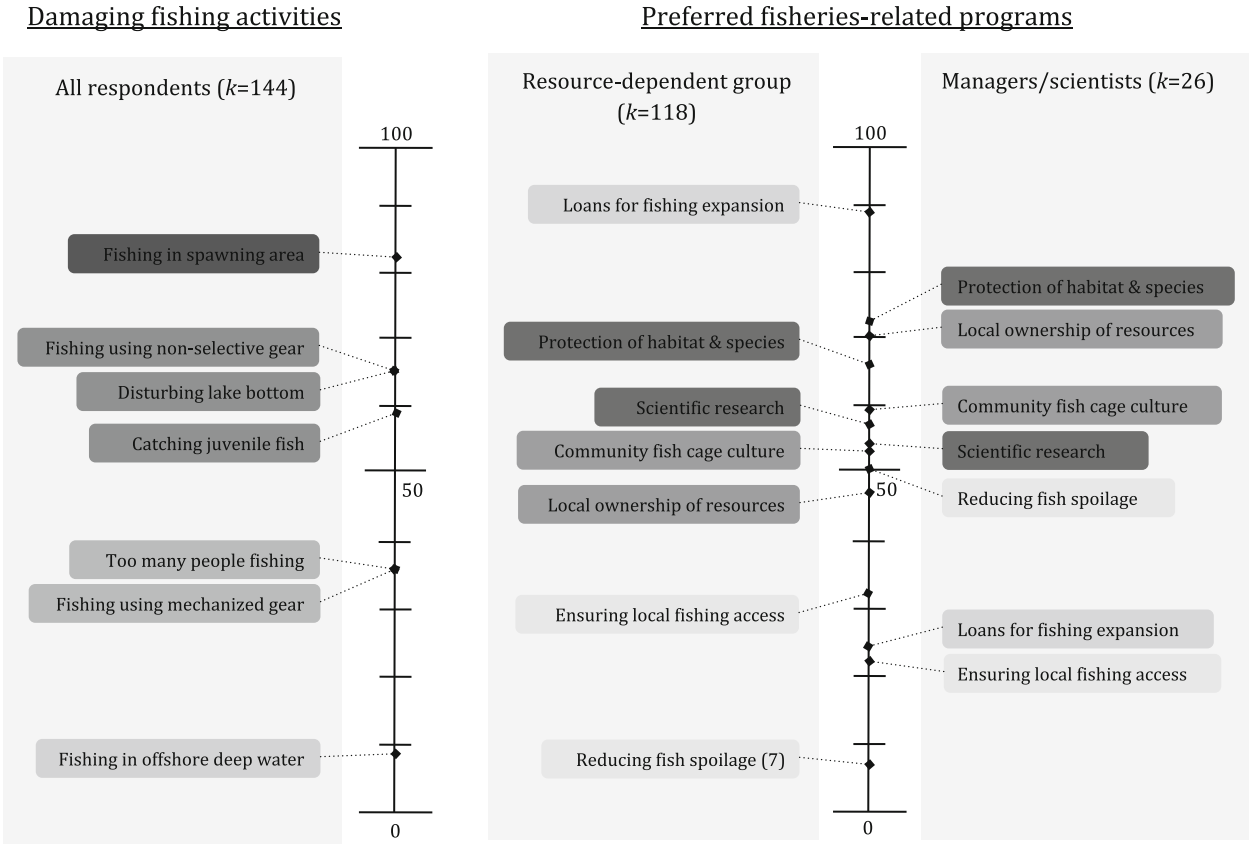

Fig. 15.3 Damage schedule of damaging fishing activities and preferred community programs

conservation, protecting fish habitats and species, and promoting scientific research on the lake ecosystem, were ranked comparatively high by both groupings. An agreement was also found in the mid-ranking of the promotion of small-scale community fish cage culturing. Finally, the program that ensures fishing access to local fishers and communities was, in comparison to the other six hypothetical programs, generally the least preferred one by both groups.

As Fig. 15.3 highlights, the two conservation-oriented programs are positioned mid-to-high in both groups' preference ranking scales. This can be loosely interpreted as the respondents valuing conservation in a moderate sense – in other words, they care about conservation to some degree. Based on this, and together with the presence of the shared understanding of damaging fishing activities, which can help create a common vision for the fisheries, we can expect moderate potential in advancing conservation goals in the SEA fishery. An important challenge must, however, be noted when looking at the top inclinations of the two groups. While the managers/scientists group were partial to the program that protects fish habitats and species, the resource-dependent group showed a clear preference for the provision of loans that would enable the expansion of one's fishing work. We believe that this difference must be duly recognized and reconciled if the conservation potential and the resolution of the illegal fishing situation is to be realized.

Discussion: Conservation, Economic Wellbeing and Illegal Fishing

The resource-dependent group's leading preference was shown to be the expansion of one's fishing work by acquiring capital through loans. In other words, the resource-dependent group's preference of economic expansion and development seems to clearly outpace other inclinations, including conservation. In fact, this empirical finding corresponds to the general, prevailing line of thinking in Malawi, which, whether it concerns fisheries or other sectors, revolves around the development agenda. Poverty alleviation and raising the standard of living through development, modernization and rapid economic growth are the main themes that reverberate in all sectors of government affairs (GoM 2009). According to the 2001 National Fisheries and Aquaculture policy, the major policy goals in fisheries are aimed at "maximizing the sustainable yield…to improve the efficiency of exploitation, processing and marketing…to promote investment in the fishing industry, rural fish farming units and exploit all opportunities to expand existing and develop new aquatic resources" (GoM 2001, 5). Furthermore, persistent attempts to expand fisheries further offshore, a production-oriented modernization agenda and examples of policy support for the industrial sector exemplify the government's pro-development position in steering the fisheries sector. It is worth noting, however, that some inconsistencies and ambivalence have been observed in fisheries development policy over the years (Chirwa 1996; Allison et al. 2002). The theme of poverty alleviation and development is also prominent in rural fishing villages at the community level,

as well as among resource users at the individual level. The economic motive involving the expansion of one's fishing work therefore appears to be an important factor hindering a more resilient expression of conservation value in the SEA fisheries.

The findings indicate that the short-term enhancement of standard-of-living is one of the resource-dependent group's main conceptions of 'what is desirable', and that this competes with conservation values. From the perspective of policy-makers and governors, a compromising solution is likely required when promoting conservation and rule compliance in order to respond to the real demands of resource-users. We submit that a policy recommendation that does not lead to enhanced standards-of-living would not be well-received and would therefore bring little positive improvement to the governability of the system. Consequently, initiatives that supply the resource-dependent group with an economic incentive to engage in conservation-oriented fishing practices are strongly recommended.

One possible approach that directly utilizes resource users' economic-minded preferences is conservation payments (or conservation performance payments). Conservation payments compensate people for their role in looking after fisheries resources (Simpson and Sedjo 1996; Ferraro 2001; Ferraro and Simpson 2002). Conventional development interventions attempt to reduce pressures on ecosystem by steering the economic development process towards a path that is compatible with ecosystem protection through initiatives such as eco-tourism and aquaculture. However, this indirect way of encouraging conservation is often observed to be ill-suited for the proper alignment of economic incentives and conservation goals. This is mainly due to the complexity of development interventions vis-à-vis the temporal and spatial scales at which conservation objectives must be achieved. This difficulty often creates little effect on conservation-related household behavior (i.e. in fishing practices) (Ferraro 2001). The premise of the payment scheme is to offer a far more cost-effective way of ensuring conservation results than conventional development projects by directly linking explicit payments to conservation progress. Although the direct payment system is not without its own set of shortcomings – ones that necessitate careful program design and implementation – past and ongoing examples can be found in several developing countries in the tropics, where they have been employed to protect ecosystems and promote stewardship of forest resources (Ferraro and Simpson 2002). For instance, Ferraro and Simpson (2002) report that Guatemala's example delivers direct payments to forest stewards through the Forest Incentives Program (World Bank 2000), while, in Costa Rica, institutional mechanisms were established to allow local, national, and international beneficiaries of ecosystem services to compensate those who protect ecosystems (Castro et al. 2000). As with these examples, such programs can be made feasible through financial support garnered from national and international donors, NGOs and various interest groups around the world who share a keen interest in protecting particular ecosystems.

Various forms of conservation subsidies and direct payments schemes should garner meaningful attention in meeting the economic/development demand of the

resource-dependent group in the SEA. This would be an important policy addition aimed at raising the level of inclination towards fisheries conservation over time and encouraging self-driven restraint in illegal fishing, especially given that the resource users surveyed in this study are already well-equipped with adequate conservation knowledge. In the process, we hope that the overall illegal fishing problem in Lake Malawi will move towards a resolution.

Conclusion

In this chapter we argued that illegal fishing may be exacerbated by the diversity of values, images and principles that people hold. An examination of such underlying concepts could therefore help generate meaningful insights about the ways illegal fishing could be lessened. Taking a cue from the relativistic nature of values, images and principles – conceived as each competing against many other values, images and principles one holds in a given situation – ecosystem conservation value was examined in detail to determine its standing vis-à-vis other values deemed to be associated with the practice of illegal fishing. The emphasis was laid on showcasing one possible tool that can be employed to gauge people's values through elicitation of judgments and preferences. The case study of a Lake Malawi fishery, in which illegal fishing and non-compliance has been a pressing issue for many years, has shown that despite the general concurrence in the conservation knowledge of all stakeholder groups interviewed – especially between resource users and governors – the degree to which they attach importance to conservation and other values is significantly different and, subsequently, indicates a plausible source for the persistence of illegal fishing. Such a result has an influence on governability. It requires empathy and higher appreciation of each other's standpoints in minimizing controversy and dissatisfaction. It also puts a limit on the overall governability of the fisheries by narrowing the range of workable agendas and demanding more creativity in governance. It is thus important that governors are made sensitive to the levels of governability and its potential sources. This chapter highlighted that one of the confounding elements giving rise to the governability problem is the deep-seated diversity of the socio-economic system founded on more durable and fundamental values, images and principles. Focusing on these underlying concepts to explore and improve governability presents an intriguing direction worthy of further elaboration and empirical testing. With the right tools and their continuing refinement, however, the effort should receive timely assistance.

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