Communication strategies for managing coastal fisheries conflicts in Bangladesh

Khondker Murshed-e-Jahan [a,*], Ben Belton [a,1], K. Kuperan Viswanathan [b,2]

[a] WorldFish, Bangladesh and South Asia Office, House No: 22B, Road No: 7, Block − F, Banani, Dhaka 1213, Bangladesh
[b] Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia, 06010 UUM Sintok, Kedah Darul Aman, Malaysia

ABSTRACT

Fisheries management involves balancing the competing demands of different users of fishery resources. Conflicts among fisheries stakeholders arise due to differences in power, interests, values, priorities, and manner of resource exploitation. Conflicts also emanate from institutional failures in managing fisheries and enforcing laws and regulations. Effective targeted communication has a key role to play in managing conflicts between fisheries stakeholders. This paper assesses a fisheries conflict communication framework called FishCom, a tool for developing plans and strategies for managing conflicts in coastal fisheries in Bangladesh. FishCom is a structured participatory process intended for use by policymakers and fishery managers. The results show that effective communication plans can play a significant role in eliminating conflicts.

© 2014 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/3.0/).

1. Introduction

In Bangladesh and many other developing countries, poverty, intense competition for fishery resources and ineffective resource management institutions increase the challenges in managing fisheries conflicts. Destructive fishing practices and competition between users of different classes of gear, resulting from ineffective governance and increasing population, are imposing severe stress on the coastal fisheries of Bangladesh. These factors also contribute to the increasing incidence of conflicts among fishery stakeholders (Kuperan and Jahan, 2010).

Conflicts take place in fisheries when groups or individuals seek the same resource using different methods or try to utilize the same space for their activities with either party seeking dominance (Bennett et al., 2001; Charles, 1992; FAO, 2003). Conflicts over access and control of fisheries and aquatic resources are a global phenomenon. However, they have particular importance in developing countries where a significant portion of the population depends on capture fisheries for food and livelihoods. Conflict can lead to violence, but avoiding and shunning conflict is also

problematic because unresolved problems may flare up again, often with renewed vigor (Salayo et al., 2006).

While a conflict resolution model (Coser, 1967; Zartman, 1991) assumes that each dispute needs to be conclusively resolved because of its destructive potential, the conflict management approach (Daniels and Walker, 2001) views some level of conflict as inevitable. The emphasis in this approach, which we adopt, is to manage conflicts in a way that can transform the dynamic towards positive change, and reduce the chances that it will turn destructive or violent. Conflict resolution refers to settling disputes with the approval of all parties, whereas conflict management refers to the long-term process of addressing conflicts constructively, some of which may never have a final resolution (Borg, 1992; Charles, 1992). Conflict management may, in fact, offer better opportunities for achieving a more lasting and meaningful peace.

Institutions are widely viewed as evolving in response to incentives to take collective action so as to minimize conflicts and transaction costs. However, the presence of institutions does not guarantee conflict prevention. Institutional weakness is pervasive in fisheries and the coastal management sectors of most developing countries (Torell and Salamanca, 2002). In particular, legal and institutional frameworks which promote and protect access rights for small-scale fishers are often either weak or poorly implemented (Delgado et al., 2003). Furthermore, the economic view of institutions and conflicts often fails to pay sufficient attention to the uneven distribution of power in society, since institutions and rules emerge through bargaining and strategic conflict, where the

* Corresponding author. Tel.: +880 2 8813250; fax: +880 2 8811151.
E-mail addresses: k.jahan@cgiar.org, kmjahan@gmail.com (K.M. Jahan), b.belton@cgiar.org (B. Belton), kuperan@uum.edu.my, kuperan@gmail.com (K.K. Viswanathan).
1 Tel.: +880 2 8813250; fax: +880 2 8811151.
2 Tel.: +604 9283624; fax: +604 9286781.

weaker actors often have no choice but to comply with the outcome (Knight, 1992).

Consequently, existing institutions are unlikely to favor or fairly represent the interests of poor resource users when they differ from those of more powerful users. Thus, the need for institutional representation in management decisions, including those about conflicts, may represent an important motivator for fishers to become involved in conflict management processes (Nielsen et al., 2004; Pomeroy et al., 2001, 2007). However, in practice, small-scale fishers' low levels of social capital often mean that they are excluded from opportunities to participate in formal conflict management processes, where such options exist. This implies a need for more participatory and inclusive conflict management processes such as those described in this paper.

Although there is no single formula for dealing with conflict, a consistent conclusion in studies of fisheries conflicts is the need for interactive conflict management strategies and improving communication between the different layers of fisheries management (Garforth, 2005; Kuperan et al., 2003; Best, 2003; Mason et al., 2002; Bennett et al., 2001). Communication among stakeholders, either between actors directly involved in conflicts or those who may play a role in negotiations, is integral to the process of framing problems (Coser, 1956). Communication is also vital for ensuring participation in the implementation of management decisions relating to natural resources and in settling any consequent disputes that may arise among stakeholders (Dugan, 1996). The guiding principle is to frame strategic communication in a way that orients stakeholders towards managing conflicts constructively and equitably (Moore, 1996).

In the present study, communication planning for conflict management is addressed as a tool for resolving conflicts or establishing consensus-building processes in coastal fisheries. This communication framework can be used by fisheries managers in collaboration with fishery stakeholders to identify conflicts, to pinpoint their root causes and constraints to their solution, and to develop suitable strategies for improving communication between stakeholders with the capacity to influence policy and resolve or reduce conflicts. The overall objective of this study is to describe the use of this framework for resolving conflicts in the coastal fisheries of Bangladesh, and to evaluate its effectiveness.

2. Coastal fisheries of Bangladesh

Bangladesh is a subtropical country situated at the apex of the Bay of Bengal, with 710 km of coastline. The fisheries sector provides livelihoods to millions of rural poor and contributes significantly to national food and nutrition security. About 511 marine species, including shrimps, are present in Bangladesh's waters (Mazid, 2002). The country produced 3.06 million tons of fish in 2010—11, of which 0.55 million tons (18%) came from marine capture fisheries (DOF, 2012). About 92% of total marine catch comes from traditional gears such as gill net/driftnets, estuarine and marine set bag nets, trammel nets, bottom long lines and beach seines, and the remaining 8% comes from large-scale trawl fisheries (DOF, 2012).

A recent report on coastal fisheries in Bangladesh shows that catch per unit fishing effort is falling, and several species of marine shrimp and fish stocks are in decline (Hussain and Hoq, 2010). Non-compliance with fishing rules and regulations and the attempts of coastal fishers to support their livelihoods by any means possible, result in increasing fishing pressure, use of destructive fishing methods and gears, and a tendency to fish whatever is available, including larvae and juveniles. This not only causes serious damage to coastal fishery resources but also creates conflict between fishers

and other resource users (Hussian and Hoq, 2010; ICZMP and WARPO, 2004; Rouf and Jensen, 2001).

Marine fisheries management and enforcement of rules and regulations is centrally regulated by the Marine Fisheries Ordinance, 1983. The Department of Fisheries (DOF) is responsible for the management, conservation, supervision and development of marine fisheries and issuing licenses for all marine fishing in the Bangladesh territorial waters. At least twelve other government departments are also directly or indirectly involved in providing support for marine fisheries development. However, due to diversity of interest and lack of coordination, there is a considerable degree of rivalry and conflict between different ministries which has been identified as a major constraint in planning marine fisheries management and development (BOBP, 1997; ICZMP and WARPO, 2004).

3. Materials and methods

As an exercise in action research, this study aimed to use the communication framework outlined above for understanding conflicts in the coastal fisheries of Bangladesh and to identify practical strategies for managing them. The framework was developed through a series of participatory discussions between stakeholders including government and NGO workers engaged in fishery management, and small-scale fishers. The next sub-sections describe the framework and corresponding tools.

3.1. The "Fisheries Conflicts Communication Framework" (FishCom)

FishCom is an approach for developing plans and strategies for managing fisheries conflicts which has previously been successfully applied to inland fisheries in Bangladesh (Jahan et al., 2009). FishCom is composed of a set of chronologically organized steps and tools for gathering, collating and evaluating information to guide participatory management of fishery conflicts (Fig. 1). The four major steps and corresponding tools are discussed below.

3.1.1. Information gathering
Information gathering is a crucial initial step. This enables understanding of the key issues related to a conflict and its causes, the values held and circumstances faced by its stakeholders, and their interrelationships. The information gathering tools used in the study include: a socioeconomic survey, an attitudinal Participatory
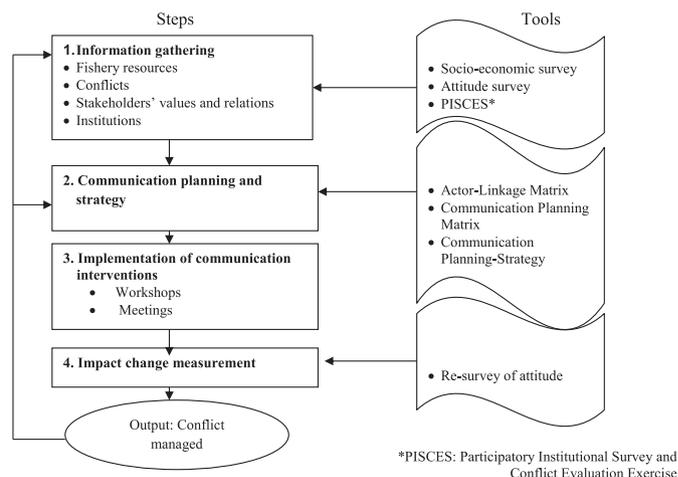

Fig. 1. Fisheries Conflicts Communication Framework (FishCom): A tool for developing plans and strategies for managing fisheries conflicts. Adapted from WorldFish, 2005.

Institutional Survey and Conflict Evaluation Exercise (PISCES), and group discussions. PISCES followed a field manual developed by Bennett and Jolley (2002), and employs a variety of participatory tools. These include: a Participatory Geographic Information Exercise (PGIE) to identify the location of conflicts; a time line exercise to evaluate conflicts from an historical perspective; institutional wheel analysis to identify communication partners who may help to resolve conflicts; and semi-structured interviews with stakeholders.

3.1.2. Communication planning & strategy

This step was designed to organize communication about conflicts to and between stakeholders. Tools include an Actor-linkage Matrix (ALM) and Communication Planning Matrix (CPM). The ALM is used to map interaction and flows of information between key actors (Biggs and Matsaert, 2004). Relevant actors in the study include fishery resource users, district and upazila (sub-district) administrators, the media, NGOs working with fisher communities and policymakers. These actors were identified using the participatory approaches applied in the information gathering steps described above. In the ALM, the actors are listed along the top and down the side of a square matrix. The cells are used to record a description of the state of communication relations between each pair of actors and constraints that distort communication.

Communication Planning Matrix (CPM) is a tool used for developing a communication strategy. The CPM identifies communication partners with whom a particular organization or project wants to communicate, and in each case defines, the objectives of communicating in resolving conflicts. It also specifies the content of the communication in order to reach the objectives and indicates the channels through which the communication with each partner could be conducted most effectively. The Communication Planning Matrix and Strategies (CPM-CS) is an expanded form of the CPM which includes the time-frame, implementers of interventions, and monetary and non-monetary costs of each option in conflict resolution. These details are necessary for the prioritization and selection of interventions to achieve objectives within a realistic time and budget schedule.

3.1.3. Implementation of communication interventions

In this step, actionable communication interventions were evaluated and pre-implementation activities were organized. Costs and logistical arrangements were considered and a variety of activities were implemented accordingly. These included meetings, workshops, dialogues, exchange visits, training on consensus building, distribution of leaflets and posters, and field rallies.

3.1.4. Impact measurement of communication interventions

This step measured changes in the livelihood outcomes of community members resulting from communication interventions. However, changes in livelihoods and socio-economic status are a long-term result of consensus building efforts. Due to the short time span of the project, this evaluation was conducted by comparing responses to an attitude statements survey carried out at the beginning and end of the survey. The attitude survey used structured attitude statements designed to obtain qualified and quantified perceptions of the conditions, norms, morals, values and priorities of fishers and conflict managers in relation to fisheries conflicts.

3.2. Study area and data

This action research work was jointly implemented by World-Fish Bangladesh and FAO's Empowerment of Coastal Fishing Communities for Livelihood Security (ECFC) project, in Cox's Bazar

district. The ECFC project was undertaken by the Government's Department of Fisheries (DOF) with technical and financial support of FAO/UNDP for a period of six years from December 2000. The overall goal of ECFC was to initiate a process of change that enhanced targeted coastal communities' capacity by increasing their stock of livelihoods assets and reducing vulnerability to insecurity.

ECFC formed four tiers of institutions at different administrative levels within the district. Separate Village Organizations (VO) were formed for men and women at village level, aimed at the social mobilization and empowerment of fishing communities. Village Development Committees (VDC) were established to facilitate co-ordination of activities undertaken by men's and women's VOs. The project also formed sub-district level fishers' networks (Upazilla Fishers Federations − UFF), and district level networks (District Fishers Federations − DFF).

These local institutions were formed to organize poor and marginal fishers and empower them to analyze their own situation, and develop and implement action plans to improve their individual and collective welfare. Fisheries Management Advisory Committees (FMAC) for the sustainable conservation of fisheries resources, comprised of a range of stakeholders' responsible for costal resource management, were also formed at upazilla and district level.

Fieldwork was organized in eighteen coastal fishing villages of Cox's Bazar, including two islands (Sonadia and St. Martin's), from October 2004, and completed in September 2006. Following Fish-Com, activities leading to the formulation of the communication strategy for conflict resolution started with gathering baseline information. The PISCES tool was applied in 10 different locations, covering all eighteen villages, to identify costal fisheries conflicts (Fig. 2). The exercise was conducted from late January 2005 to mid-February 2005. A series of workshops, meetings, and group
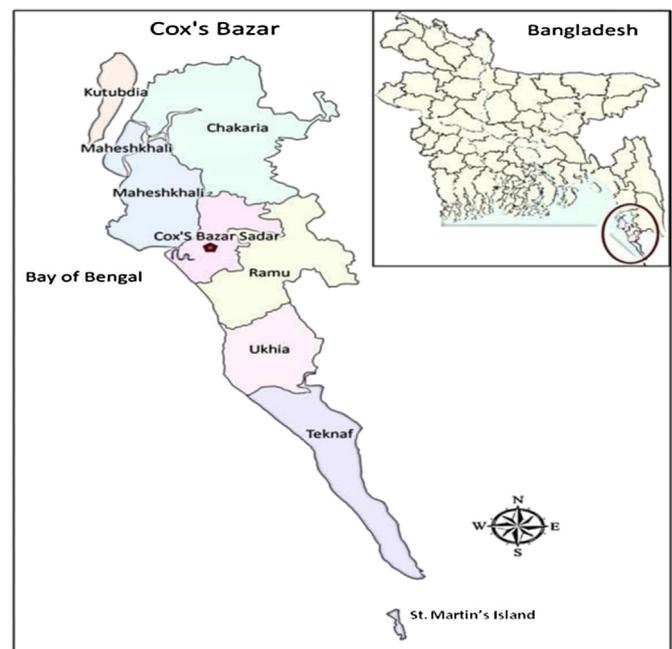

Fig. 2. Map of Bangladesh with study location.
(Source: Authors own drawing using Centre for Environmental and Geographic Information Services (CEGIS) data). The Government of the People's Republic of Bangladesh established the CEGIS as a scientifically independent center of excellence is to support the management of natural resources for sustainable socio-economic development using integrated environmental analysis, geographic information systems, remote sensing, and information technology.

discussions were conducted at the upazilla and village level from March 2005 to June 2005 to develop the communication planning matrix and strategy for conflict resolution.

Selected communication interventions were conducted in each study site from July 2005–June 2006 with the active participation of stakeholders. Activities included providing consensus building training and organizing workshops, meetings and dialogues among fishery stakeholders. During the study period ECFC also organized a number of awareness raising communication events such as field rallies, miking,[3] folk dramas, circulation of posters and leaflets, and mass media campaigns against illegal fishing practices. A number of exchange visits between Bangladesh and Indian fishery stakeholders were also organized to help develop a common understanding of fishery problems.

An attitude survey involving 167 fishery stakeholders and 53 conflict managers was implemented to measure the impact of communication interventions. Conflict managers included community leaders such as CBO leaders, village heads, local government body members, boat owners and fish traders' association leaders, respected persons of the locality, fishery officers, NGO and project staff, politicians and media personnel. An ex-ante attitude survey was conducted in January–February 2004 using face-to-face meetings and group discussions. The same set of questions was used from July 2006–August 2006 to assess changes in attitude as a result of communication interventions. A combination of general and site-specific attitude statements was compiled to cover subject matter including; understandings of conflicts, manageability of conflicts, prerequisites for conflict resolution, resolution processes, and responsibility in conflict resolution. Attitude statements were evaluated using the five-point Likert scale method, the range of which ('strongly agree', 'agree', 'undecided', 'disagree', 'strongly disagree') were adopted after discussion with the communities.

4. Results and discussion

4.1. Conflicts in coastal fisheries

The diversity of resources and livelihood opportunities in coastal areas attracts various extractive interests (Marschke, 2012). Conflict scenarios have increasingly arisen as stagnating fishery harvests have coincided with pressures from population growth and a growing range of resource users from outside the area. Over time, competition between traditional and new entrants to the fisheries, along with institutional weakness have become major causes of conflict. The application of PISCES (used for information gathering under FishCom) identified several types of conflict in the study sites which are outlined briefly below:

4.1.1. Who controls the fishery?
Conflicts of this type relate to who determines the access, rights or entitlements of fishers to fish in a disputed area. Access issues are the root cause of this type of conflict. One such conflict was reported by fishers from Natmura village near the River Naf of Teknaf Upazilla who reported that they had been forced to stop fishing in parts of the river surrounding a neighboring village after fishers there began to enforce a longstanding claim that the area 'belonged' to their village. The dispute occurred due to the assertion of pseudo-property rights based on residency and ancestral occupation, over an area of water which was formally designated as open access. This type of conflict may also occur due to rivalry over access to fishing grounds between small-scale traditional fishers

---

[3] Public broadcast using vans that travel from village to village broadcasting messages is known locally as miking.

and powerful local individuals, a situation found to be common in all the study sites. As a result of these dynamics, operators of fixed gear such as estuarine set bag nets (ESBN) and marine set bag nets (MSBN) reported having to move from locations where they had fished for generations to less productive areas after locally powerful individuals took control over the fishing grounds by use of verbal threats or, frequently, physical violence, and sometimes allowed them to fish only after receiving monetary payment, which is totally illegal.

Conflict over access rights also occurs when the fishers of bordering nations (Myanmar and India) enter Bangladesh's territorial waters or vice-versa, and become involved in conflict with local fishers. This type of transboundary conflict comes to the fore when the border security force of the neighboring nation seizes boats and nets and arrests fishers, claiming that they entered territorial waters illegally. These incidents are made more frequent because of unresolved issues of boundary demarcation at sea. Fishers face substantial losses when they are arrested. One fisher interviewed in Teknaf upazilla was caught by the Myanmar border security force with other fellow fishers in 2003 and reported that they were sent to jail after being arrested and faced severe torture while in custody.

Bangladesh has brought the issue of sea boundary demarcation with India and Myanmar to the UN Arbitration Tribunal. The International Tribunal for the Law of the Sea offered a verdict on this longstanding dispute over the maritime boundary in the Bay of Bengal between Bangladesh and Myanmar in 2012 (The Daily Star, 2012). Arbitration with India is expected to be settled in 2014. The Myanmar–Bangladesh verdict gave undisputed rights to both the countries to the fish in waters and to explore the natural resources beneath the seabed of their respective maritime boundaries and clearly demarcated the marine boundary between the two countries. The verdict has lessened the tension between the two countries – which nearly escalated into a conflict during 2008 when both countries sent their navy to the disputed area where Myanmar was drilling for exploring oil-gas – and is thus likely to have positive implications for transboundary disputes relating to the fishery.

4.1.2. How is the fishery controlled?
This type of conflict appears due to lack of implementation of regulations by enforcment agencies. Conflicts of this type in the study sites were due to indiscriminate fishing practices and resource sharing among rival groups of fishers. Monofilament net, mosquito net and small mesh net used for shrimp fry collection are banned by law for use in fishing yet are frequently used by the illegal gear operators at sea, which often creates conflict with other fishers. The use of trawlers encroaching in areas allocated for traditional fishers was one of the most common conflicts in the study area. The disputes result from inadequate enforcement of the Marine Fisheries Ordinance 1983, which aimed to curb the excess capacity of industrial trawlers by creating separate fishing zones – up to 40 m water depth for traditional gear and above 40 m water depth for trawlers.

4.1.3. Relationships between fishery users
Conflicts of this type occur when a group of fishers asserts that their fishing operations and rights are negatively affected by the action of another group of fishers or stakeholders. The study found that disputes gravitate around competing claims on fishing grounds mostly between active gears such as Small Mesh Drift Nets (SMD), but also occur between active and passive gears such as SMD and Marine Set Bag Nets (MSBN). When two parties fishing in the same area accidentally drift into each other and become entangled the nets may need to be cut, thereby also resulting in conflicts between the two parties.

Conflicts of this type can also happen between fishers and boat owners when the latter refuse to pay fishers' according to their earlier commitments, or are reluctant to provide safety equipment before the fishing voyage. Boat owners who were interviewed admitted that this often causes conflicts with fishers. However, owners stated that fishers did not always provide them with the true figures of fish catches. They suspected some fishers under their employ illegally sold fish at sea in order to gain extra benefits. According to owners, this is the main reason for conflict with the fishers they employ.

Fishers and boat owners also reported conflicts with fish traders due to the nature of market governance structures. Conflict arises when local fish traders create a syndicate and force the fishers or boat owners to sell their catch directly to them, preventing traders from other areas from competing. Fishers reported that they never received the perceived 'true' market value from these fish traders. Conflict also happened between money lenders and fishers when the latter failed to repay their loans.

4.1.4. How are fishery resources used?

This type of conflict arises when different uses of the aquatic environment create adverse impacts on the fishery resource or its users. Tourism, and shrimp and salt farming in the costal shoreline were all noted as causes of conflict with fishers. During historical trend analysis, fishers reported that mangrove destruction had increased many fold in recent decades due to shrimp and salt farming, with the result that they were now more vulnerable to natural disasters (cyclone, tidal waves etc.) as the natural buffer created by mangroves had been destroyed. Furthermore, shrimp and salt farming is also responsible for environmental changes in coastal areas such as increasing salinity and soil degradation, destruction of coastal vegetation and water logging, leading to irreversible changes to micro-flora and fauna and fish breeding habitats, as well as loss of income for poor coastal households (CPD, 1998).

Conflict between fish processing and tourism was reported in St. Martin's Island and Moheshkhali of Cox's Bazar district. In these areas fish drying is an important occupation for fishers, who have dried their fish close to beaches adjacent to fish landing sites for centuries. However, in order to make beach more attractive to tourists the authorities have imposed bans on drying fish near to the shore. Fishers were not opposed to the expanding tourism industry as it also provides income and employment for them, but they felt that government should make alternative arrangements before taking restrictive decisions of this nature, such as allocating other areas where they could dry fish.

4.1.5. Relationship between fisheries and non-fishery governance issues

This type of conflict relates to issues of corruption, bribery, lack of coordination and the over-lapping functions and jurisdictions of government agencies. Conflicts of this type mainly occur due to a lack of formal structures for fisheries management and conflict resolution, lack of transparency and poor governance. Issues identified by fishers during the study included encroachment of areas used for net/boat drying by powerful individuals in connection with law enforcement agencies, theft of fishing gear from landing sites, pirate attacks at sea, illegal toll/tax collection by authorities at landing sites, and corruption in the boat licensing process. Fishers run into conflict with law enforcers, including government fishery officers, whom they expect to protect their interests as mandated by law. According to the stakeholders, many local conflicts in fisheries could have been easily resolved or would not have arisen if there had been proper implementation and enforcement of rules and regulations, and good coordination between government agencies for the management of the resources affected.

4.2. Conflict management in coastal fisheries

The Actor-Linkage Matrix (ALM) analysis of conflicts in the study sites found a lack of communication among stakeholders even in the midst of brewing conflicts. In all the study sites, only fisher-to-fisher communication was evaluated as generally effective, because fishers lived in the same community and could meet face-to-face to discuss conflict issues. Formation of informal local level fishers' institutions by ECFC had positive impacts on communication between fishers and also created the opportunity for them to bring particular conflicts to the attention of government agencies. Most stakeholder groups had negative perceptions of the effectiveness of communication with government agencies and administrators. Communication between groups of stakeholders and the mass media were also generally rated as poor due to perceived bias in disseminating information. Most stakeholders criticized the prevalence of top-down communication practiced by the government or DOF. Meanwhile, researchers were evaluated as attempting to communicate with other stakeholders but with limited effectiveness due to lack of political profile, personnel and resources. Research outputs were also noted as having little influence on policymakers and they were criticized as not being understood by and explained to fishers.

The synthesis of Communication Planning Strategies identified a wide range of mostly participatory strategies for addressing fisheries conflicts. These often focused on reducing illegal fishing, reviewing fisheries policies and rules to reduce sources of conflicts, and building the capacity of fishers and institutions for managing conflicts. The cost associated with such strategies depends on the means of communication employed. Group discussions, informal meetings, direct contact or dialogues, and publicity through the mass media are generally cheaper than workshops, leaflets, posters and policy briefs. The most expensive communication channels included a video show for awareness-creation, trainings on conflict resolution methods and alternative income-generating activities, and lobbying for policy change. The cost of such communication strategies remains a constraint for poor coastal communities where institutional support is needed. The next section discusses a number of communication interventions applied in study sites during the study period.

4.2.1. Workshops and meetings for ensuring multi-stakeholder participation in conflict management

Meetings and workshops were found most effective among a wide range of communication strategies because they remained the best means to link communities, NGOs, government and fishers' organizations in direct interaction to reach some level of consensus on a particular dispute. As an example, ongoing conflict between the boat owners and fishers was common in all the study sites. In order to address these disputes, workshops and meetings were organized, at both the upazilla and district levels, to discuss possible solutions. In almost all cases these resulted in a common consensus between boat owners and fishers associations to resolve the issue by agreeing to prepare a written contract for recruitment, labor payment and safety provision, instead of verbal contracts, which were identified as the major reason for conflicts about payment between the boat owners and fishers.

In some cases it was also agreed to send boat owners' representatives on fishing voyages to reduce misunderstandings regarding illegal landings. In the absence of strict enforcement from the government, both groups urged close supervision by their associations for proper implementation of the decisions. Due to these

initiatives, some fishers in the study started receiving written contracts for labor payment from boat owners for the 2006 fishing season, where none had been provided in 2005. However, although this was a positive step towards resolving these conflicts, there was concern among the fishers involved over whether the majority of boat owners who had agreed to this solution would honor it by drawing up and abiding by contracts in the absence of a formal system of governance to ensure that this was done.

4.2.2. Participatory Action Plan Development (PAPD)

Training of extension agency and NGO staff and community leaders on the Participatory Action Plan Development (PAPD) consensus building tool was found effective for developing community action plans for conflict resolution. The steps of PAPD include: identifying the most likely potential conflicts in an area; conflict solution analysis to assess the likely impact of actions needed to achieve these solutions, and; forming consensus on solutions (Sultana and Thompson, 2004; Barr and Dixon, 2001; Holmes and Scoones, 2000). The PAPD method engages stakeholders who have existing or potential conflicts with fishers over the use of common fishery resources. This consensus building approach helped to resolve some critical conflicts in the study area.

In Moheshkhali Upazilla, Cox's Bazar district, for example, the dispute between fishers and local administration over fish drying places was identified as the most severe conflict. In order to make the place attractive to tourists, the local administration had banned fishers from processing or drying fish near the beach. This triggered a spate of arguments between locals and the authorities as fishers derived much of their livelihoods from fish drying. Through the PAPD exercise, fishers and the local administration agreed that an alternative spot would be allocated for fish drying activities. Fishers and enforcement officers who participated in the PAPD process explicitly understood the importance of conflict resolution and consensus building in the development of an action plan for improving fishers' livelihoods and for sustaining the tourism industry.

4.2.3. Multi stakeholder committee for conflict resolution

ECFC formed a Fishery Management Advisory Committee (FMAC) at upazilla and district level to support the sustainable conservation of fishery resources. The committee was headed by the local administrative chief, and all other extension agencies and institutions involved in coastal fishery management, including fishers' representatives, were members. The committee was found to be very effective in managing fisheries conflicts through dialogue and discussion with the conflicting parties. According to fishers, this forum helped them to quickly bring disputes to the notice of the administration and other stakeholders.

FMAC had a good record of solving conflicts through informal or formal discussions. For example, fishers in Moheshkhali upazilla had used a public place of about 6 ha for boat landing and net drying for many years. Some powerful local people unexpectedly and illegally encroached on a large portion of this land and established settlements, then required fishers to pay for any use of the area and often harassed them physically. Fishers had previously attempted unsuccessfully to bring this issue to the attention of the upazilla level administration. However, after the issue was raised with a wider circle of stakeholders during the FMAC meeting, staff from the district level administration took immediate legal steps to free the area for the fishers.

4.2.4. Awareness raising in fishing communities

Social mobilization of communities through different awareness raising activities such as folk dramas, leafleting, posters, rallies, and miking was used to reduce illegal fishing practices in coastal areas. These initiatives, which were supported by the Department of Fisheries, allowed community members to raise their collective voice against illegal gear operators. The study revealed many examples where community initiatives were successful in reducing the use of illegal gears as well as conflicts. In study sites in Teknaf upazilla destructive monofilament gill nets worth approximately $39 000 were voluntarily surrendered by the owners of illegal gear due to persistent pressure from the fishers and the local administration (Dainik Cox's Bazar, 2006). According to the fishers, significant reductions in numbers of shrimp fry collectors also occurred as a result of mass awareness raising activities and the self-enforcement activities of fishers and CBOs, with assistance from community leaders.

4.2.5. Informal institutions as conflict mediators

Generally people in rural Bangladesh are reluctant to use the formal legal system for conflict resolution due to the prohibitive costs associated with litigation and police action. Instead, many fishers prefer to settle the issue through saleesh (informal village level meetings). The transaction costs involved in using the informal system are much lower than that of the formal system. In most cases, fishers bring cases first to the head of the village or Union Parishad (the lowest stratum of the local government) who, along with a panel of elders, will summon the conflicting parties, hear their arguments and concerns, and come to a decision on the issue. Study participants noted that minor conflicts such as disputes between traditional gear users or conflict between fishers, local traders and money lenders are generally settled by saleesh. According to the fishers we interviewed, one of the main advantages of settling the disputes locally was that the powerful local individuals involved in deciding the outcome of the saleesh could monitor and push for implementation of their decisions. However, in many cases this results in unfavorable outcomes when the illegal encroachers have good relations with the powerful.

ECFC attempted to improve the effectiveness of these local institutions by improving the skills of community leaders through engagement in workshops and meetings. During the study it was observed that these informal systems were also effective in dealing with some severe conflicts. In one particular case near Kutubdia Channel, locally influential individuals forcefully occupied grounds which a number of ESBN operators had fished for many years. When the fishers brought this to the notice of the Union Parishad chairman, he immediately called a saleesh where a decision was taken to allow them back into their fishing area.

4.2.6. Regional cooperation

Transboundary conflict is a major problem in coastal fisheries, causing much suffering for the fishers involved. Although this type of conflict is very difficult to control, building better communication between Bangladeshi officials and their counterparts in neighboring India and Myanmar may help to minimize problems. In order to foster cooperation, ECFC organized several exchange visits between the neighboring countries. Fishing community members and ECFC project staff shared their experience on fishery management issues with officials from neighboring countries during those visits. The better relationships that developed as a result of these visits helped fishers to resolve a number of disputes.

In one particular case, the Indian security force arrested 115 Bangladeshi fishers from Kutubdia upazilla claiming that they had entered Indian territory. The fishers were sentenced to one and half years in prison but, as a result of continuous dialogue between the officials of the two countries, were released after a month. The fishery officials and the Fishers Association of West Bengal of India played an important role in their release. There are no official statistics on how many Bangladeshi fishers are now in jail in India and

Myanmar. The exchange of fishers is also a very cumbersome and time consuming process, but the example presented here indicates that discussions at the national, local and Fishers Association levels can help in resolving these problems. According to the stakeholders involved, regional forums such as the South Asian Association for Regional Cooperation (SAARC) can also contribute in these types of instances.

4.3. Fishers' and conflict managers' attitudes to conflict resolution

An attitude survey was conducted in the study area to capture attitudinal changes that could be attributed to the communication interventions. Table 1 shows some significant changes in attitudes among fishers, although few such changes were found among conflict managers. Jahan et al. (2009) also observed similar findings in a study of the inland fisheries of Bangladesh. They argued that fishers' attitudes are formed through direct observation of the causes and effects of conflict situations, meaning that they can easily recognize changes resulting from the conflict resolution

process. In contrast, conflict managers are less likely to change their attitudes in the short term as these are linked to their institutional positions which reflect their own interests as powerful actors. This means that they require more time to accept counter persuasion.

Table 1 shows that significant attitudinal changes about the management of fisheries conflicts occurred among both fishers and conflict managers. As an example, in the final survey both parties expressed an increased consensus that greater cooperation between government and communities is required for better resource management. This new understanding inspired them to undertake joint awareness raising activities such as initiatives against illegal gear operators. During group discussions, the majority of fishers in the study sites reported that use of destructive gears had been significantly reduced due to these initiatives.

Fishers were in strong agreement that conflicts can be resolved, but that all parties need to understand existing policies and regulations before the process of conflict resolution can begin. For example, during group discussions it was found that many boat owners were not aware of the law regarding safety requirements at

Table 1
Attitude of fishers and conflict manager before and after intervention.

Attitude statements	Fishers		t-ratio	Conflict managers		t-ratio
	Before	After		Before	After	
Understanding of Conflicts						
Influx of new people into fishing leads to severe conflicts in fisheries	1.73 (0.69)	1.68 (0.64)	1.53	1.84 (0.97)	1.79 (1.15)	−0.18
Too many people chasing fewer fish is a major cause of fisheries conflicts	1.92 (0.99)	1.78 (0.79)	1.62	1.74 (0.76)	1.72 (0.67)	0.16
If government agencies did their job properly, there would be very few conflicts fisheries	1.18 (0.39)	1.13 (0.33)	1.61	1.30 (0.46)	1.28 (0.45)	−0.32
Influence of powerful influentials in fishing is the major cause of fisheries conflicts	2.05 (1.05)	1.96 (0.97)	0.81	1.65 (0.61)	1.51 (0.74)	1.13
Destructive fishing practices are the reason for fisheries conflicts	1.52 (0.68)	1.44 (0.59)	1.51	1.30 (0.46)	1.28 (0.45)	0.24
Manageability of conflicts						
Powerful groups will always be able to win conflicts with less powerful fishers	2.08 (1.08)	2.10 (0.99)	−0.41	2.16 (1.23)	2.23 (1.41)	- 0.46
Local cooperation for conflict resolution will be effective if government agencies participate	1.75 (0.66)	1.66 (0.66)	2.18**	2.00 (1.13)	1.63 (1.00)	1.86*
Communities can manage fisheries conflicts themselves	1.97 (1.01)	2.02 (0.91)	−0.97	3.28 (0.83)	3.16 (0.93)	1.06
Prerequisites for resolution						
All parties need to understand existing policy and regulations before a process of conflict resolution can begin	1.34 (0.49)	1.02 (0.24)	7.34*	1.74 (1.03)	1.37 (0.49)	2.07**
Conflicts can be resolved if the community is organized and works together with government for resource management	1.40 (0.53)	1.28 (0.75)	1.73***	1.40 (0.79)	1.21 (0.41)	1.75***
Fisheries conflicts can be resolved if fisheries rules are strictly enforced	1.99 (0.64)	1.45 (0.65)	9.77*	1.81 (0.73)	1.72 (0.83)	1.15
Better understanding of one another's needs will make it easier to resolve conflicts	1.26 (0.53)	1.05 (0.29)	6.52*	1.05 (0.21)	1.02 (0.15)	0.57
Process of resolution						
By strengthening the capacity of local institutions, conflicts can be resolved	1.96 (0.77)	1.72 (0.86)	2.80*	1.86 (1.21)	1.79 (0.89)	0.55
Conflicts can be resolved through dialogue and negotiation	2.17 (1.13)	1.60 (0.93)	6.96*	1.77 (1.02)	1.23 (0.65)	4.77*
Conflicts between fishers can be resolved by bringing the parties together to discuss	1.95 (0.76)	1.80 (0.73)	3.141*	1.70 (0.71)	1.23 (0.43)	3.35*
Responsibility for resolution						
Government is the only agency that can manage conflicts	2.43 (1.42)	2.47 (1.38)	−1.34	1.93 (1.12)	1.91 (1.38)	0.14
The NGOs can support communities in managing conflicts	2.26 (1.40)	2.12 (1.26)	2.50*	2.16 (1.38)	2.07 (1.47)	0.62
Fishers and their leaders should take the initiative to resolve conflicts	2.04 (1.28)	1.91 (1.23)	2.74*	1.93 (0.99)	1.77 (1.04)	1.47
Local elites can play an important role in conflict resolution	1.55 (0.69)	1.41 (0.70)	1.79***	1.70 (0.71)	1.51 (0.51)	1.39
Everyone has a social responsibility to help to resolve conflicts	1.63 (0.73)	1.38 (0.53)	3.52*	1.33 (0.47)	1.23 (0.43)	1.16

Note: Figures in the parentheses indicates the standard deviation; *Significant at α = 0.10; **Significant at α = 0.05; ***Significant at α = 0.01.

sea, and that conflicts start when fishers demand safety equipment from boat owners. Training on rules and regulations organized by ECFC was a factor in motivating them to comply with these regulations.

Both fishers and conflict managers expressed the view that dialogue and discussion between conflicting parties was necessary to resolve conflicts. They felt the necessity of a multi-stakeholder committee representing all the relevant stakeholders for facilitating discussion. The success of the FMAC in resolving conflicts in the study area influenced them in reaching this conclusion. Strengthening the capacity of fishers' organizations and strict enforcement of regulations by conflict managers were both also perceived to be helpful for fisheries conflict resolution.

5. Conclusion and recommendations

The economic value of aquatic and coastal resources and livelihood opportunities in the coastal waters of Bangladesh has attracted a diversity of users. Conflicts arise as small-scale fishers, who are present in millions, interact with stakeholders including other fishers. This often includes the authorities, who fail to properly enforce rules and regulations. The sector suffers further due to a lack of inter-agency coordination among the various government institutions with jurisdiction over fisheries. Such failures open up opportunities for the violation of management rules and regulations, and hence create conflicts in the sector. Even where lasting conflict resolution may not be possible it is important to manage conflict so that it can be channeled to constructive and collaborative solutions instead of leading to violence or deepening poverty.

The study showed that many conflicts can be resolved through appropriate communication strategies. A systematic communication and advocacy program with clearly defined approaches and a well-developed battery of information, education and communication materials can form the core of an intervention strategy to improve stakeholder interactions and resolve conflicts. FishCom was applied in the study area to resolve a number of such conflicts. In most cases, actors involved arrived at a greater level of consensus, indicating that more conflicts in fisheries could be resolved if FishCom were institutionalized through coastal resource management plans. However, FishCom is not a panacea for resolving all fisheries conflicts. Moving further in this direction would require harmonization of the functions and roles of a range of institutional stakeholders in organizing and implementing coordinated action plans for conflict resolution.

The study showed that government and community partnerships can support movement toward more effective ways of managing conflicts and improve fisheries management. Representation and participation of users in the conflict resolution process and involvement of fishers in the implementation of decisions are important factors in legitimizing a management system (Salayo et al., 2008; Pomeroy et al., 2007). These lessons could enhance opportunities for formulating policies and influencing policy actions for involving communities in the improved management of conflicts over shared resources.

This study indicates that stakeholders recognized the value of multi-stakeholder forums in fisheries conflict management processes. They believed that the collective efforts of fishers, community members, and government and non-governmental organizations involved in fisheries management are required in order to design effective conflict resolution systems. Inter-sectoral analysis and dialogue undertaken by these stakeholders can facilitate better solutions to fisheries conflicts. The study shows that committees of this nature are able to represent a genuine interest in fisheries development, and can turn conflicts into opportunities for facilitating more sustainable use of fisheries resources.

Appendix A. Supplementary data

Supplementary data related to this article can be found online at http://dx.doi.org/10.1016/j.ocecoaman.2014.01.003.

References

Barr, J.J.F., Dixon, P.J., 2001. Methods for Consensus Building for Management of Common Property Resources. Final Technical Report of R7562. Center for Land Use and Water Resources Research, Newcastle University, Newcastle.

Bennett, E., Jolley, T., 2002. PISCES field manual, The management of conflict in tropical fisheries (R7334). Final Technical Report. Center for the Economics and Management of Aquatic Resources (CEMARE), University of Portsmouth, U.K. p. 123–127.

Bennett, E., Neiland, A., Anang, E., Bannerman, P., Rahman, A.A., Huq, S., Bhuiya, S., Day, M., Fulford-Gardiner, M., Clerveaux, W., 2001. Towards a better understanding of conflict management in tropical fisheries: evidence from Ghana, Bangladesh and the Caribbean. Mar. Policy 25, 365–376.

Best, J., 2003. Report of Communication Strategy. Community Based Fisheries Management Project Phase 2 (CBFM-2). WorldFish Center, Dhaka, Bangladesh.

Biggs, S., Matsaert, H., 2004. Strengthening poverty reduction programmes using an actor-oriented approach: examples from natural resources innovation systems. Agricultural Research and Extension Network, Network Paper No. 134. London, UK: Overseas Development Institute.

BOBP. 1997. Report on the National Workshop on Fisheries Resources Development and Management in Bangladesh. Organized by Ministry of Fisheries and Livestock, Bangladesh in Collaboration with BOBP/ FAO & ODA on 29 October − 1 November at Dhaka, Bangladesh.

Borg, M., 1992. Conflict Management in the Modern World System. Sociological Forum 7 (2), 261–282.

Charles, A.T., 1992. Fishery conflicts: a unified framework. Mar. Policy 16, 379–393.

Coser, L.A., 1956. The Functions of Social Conflict. Free Press.

Coser, L.A., 1967. Social conflict and the theory of social change. Br. J. Sociol. 8 (3), 197–207.

Center for Policy Dialogue (CPD), 1998. Coastal aquaculture and environment. In: Paper Presented at the Workshop on Environmental Impact of Structural Adjustment Policies in Bangladesh, Organized by the Center for Policy Dialogue, 17 May 1998, Dhaka (Mimeo).

Daniels, S.E., Walker, G.B., 2001. Working through Environmental Conflict: the Collaborative Learning Approach. Praeger, London.

Delgado, C.L., Wada, N., Rosegrant, M.W., Meijer, S., Ahmed, M., 2003. Fish to 2020: Supply and Demand in Changing Global Markets. WorldFish Center Technical Report 62, p. 226.

DOF, 2012. Fishery Statistical Yearbook of Bangladesh. Department of Fisheries, Dhaka, Bangladesh.

Dugan, M., 1996. A nested theory of conflict. Leadersh. J. Women Leadersh. Shar. Vis. 1, 9–20.

FAO, 2003. The Ecosystem Approach to Fisheries. In: FAO Technical Guidelines for Responsible Fisheries. No. 4, Suppl. 2. Fisheries Department, Food and Agriculture Organization, Rome, Italy.

Garforth, C., 2005. Communication and public awareness strategies. In: Paper Presentation in the Regional Coordination Workshop on Fish Fights over Fish Rights: Managing Conflicts and Exit from the Fisheries and Security Implications for South and Southeast Asia on 17 May − 20 May. International Rice Research Institute Complex (IRRI), Los Banos, Laguna, Philippines.

Holmes, T., Scoones, I., 2000. Participatory Policy Process: Experiences from North and South. IDS Working Paper 113. Institute of Development Studies, Brighton.

Hussain, M.G., Hoq, M.E. (Eds.), 2010. Sustainable Management of Fisheries Resources of the Bay of Bengal − Compilation of National and Regional Workshop

Reports. Support to Sustainable Management of the BOBLME Project. Bangladesh Fisheries Research Institute, p. 122. SBOBLMEP Pub./Rep. 2.

ICZMP, WARPO, 2004. Where Land Meets the Sea: a Profile of the Coastal Zone of Bangladesh. The University Press Limited, Dhaka.

Jahan, K.M., Salayo, N.D., Kanagaratnam, U., 2009. Managing fisheries conflicts through communication planning: experience from inland fisheries of Bangladesh. Fish. Res. 99, 112–122.

Knight, J., 1992. Institutions and Social Conflict. Cambridge University Press, Cambridge.

Kuperan, K.V., Jahan, K.M., 2010. Noncompliance a major threat in fisheries management-experience from the Artisanal coastal fisheries of Bangladesh. J. Int. Stud. 6, 97–113.

Kuperan, K.V., Nielsen, J.R., Degnbol, P., Ahmed, M., Hara, M., Abdullah, N.M.R., 2003. Fisheries Co-management Policy Brief: Findings from a Worldwide Study. The WorldFish Center, Penang, Malaysia.

Marschke, M., 2012. Life, Fish and Mangroves: Resource Governance in Coastal Cambodia. University of Ottawa Press, Ottawa.

Mason, S.A., Spillmann, K.R., 2002. Environmental conflicts and regional conflict management. In: Cogoy, M., Steininger, K.W. (Eds.), Economics of Sustainable Development: International Perspectives, The Encyclopedia of Life Support Systems. UNESCO-EOLSS.

Mazid, M.A., 2002. Development of fisheries in Bangladesh. Plans and strategies for Income generation and poverty alleviation. Published by Momin offset press, Dhaka, Bangladesh.

Moore, C.W., 1996. The Mediation Process: Practical Strategies for Resolving Conflict. Jossey-Bass.

Nielsen, J.R., Degnbol, P., Kuperan, K.V., Ahmed, M., Hara, M., Abdullah, N.M.R., March 2004. Fisheries co-management-an institutional innovation? Lessons from South East Asia and Southern Africa. Mar. Policy 28 (2), 151–160 (10).

Pomeroy, R.S., Katon, B.M., Harkes, I., 2001. Conditions affecting the success of fisheries co-management: lessons from Asia. Mar. Policy 25 (3), 197–200.

Pomeroy, R., Parks, J., Pollnac, R., Campson, T., Genio, E., Marlessy, C., Holle, E., Pido, M., Nissapa, A., Boromthanarat, S., Huei, N.T., 2007. Fish wars: conflict and collaboration in fisheries management in Southeast Asia. Mar. Policy 31, 645–656.

Rouf, M.A., Jensen, K.R., 2001. Coastal Fisheries Management and Community Livelihood. ITCZM Monograph No. # 04.

Salayo, N., Garces, L., Kuperan, K.V., Ahmed, M., 2006. 'Fish fights over fish rights': non-traditional security issues in Southeast Asia. In: Studying Non-traditional Security in Asia: Trends and Issues. Marshall Cavendish, Singapore.

Salayo, N., Garces, L., Pido, M., Kuperan, K.V., Pomeroy, R., Ahmed, M., Siason, I., Seng, K., Masae, A., 2008. Managing excess capacity in small-scale fisheries: perspectives from stakeholders in three South Asian Countries. Mar. Policy 32, 692–700.

Sultana, P., Thompson, P., 2004. Methods of consensus building for community based fisheries management in Bangladesh and Mekong Delta. Agric. Syst. 82, 327–353.

The Daily Star, 2012. A 'Great Win' for Bangladesh. http://www.thedailystar.net/newDesign/news-details.php?nid=227828.

The Dainik Cox's Bazar, 2006. Huge Amount of Monofilament Net Destroyed in Teknaf. News Published in Dainik Cox's Bazar, Local Daily Newspaper Published from Cox's Bazar.

Torell, M., Salamanca, A. (Eds.), 2002. Institutional Issues and Perspectives in the Management of Fisheries and Coastal Resources in Southeast Asia, p. 212. ICLARM Technical Report 60.

WorldFish, 2005. Enabling Better Management of Fisheries Conflicts. Final Technical Report. The WorldFish Center, Penang, Malaysia.

Zartman, I.W., 1991. Conflict and resolution: contest, cost, and change. Ann. Am. Acad. Polit. Soc. Sci. 518, 11–22.