



## Proceedings of the Small-scale Fisheries Symposium 2019

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**Enhanced Coastal Fisheries in Bangladesh (ECOFISH-Bangladesh)**  
**WorldFish, Bangladesh and Department of Fisheries Bangladesh**  
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## 1 Executive Summary

USAID's ECOFISH activity of WorldFish organized a 2-day long Small-scale Fisheries (SSF) Symposium on June 19-20, 2019 at a local Hotel in Banani, Dhaka. The symposium aimed at sharing the knowledge on small-scale fisheries (SSF) management and improved governance in the inland, coastal and artisanal marine fisheries of Bangladesh. FAO Small-scale Fisheries Guidelines and its implementation challenges were thoroughly discussed. Dr. Philippa Cohen, RSSF Program Leader, WorldFish. Mr. Bill Collis, Country Director (in-charge), WorldFish, Bangladesh and Renerio Acosta, Economic Growth Office, USAID spoke on the occasion. A total of 7 papers covering all aspects of SSF were presented by 7 national SSF experts. About 60 participants from the Ministry of Fisheries & Livestock, Department of Fisheries, BFRI, universities, international organizations, NGOs and private sectors participated in the symposium. The participants thoroughly discussed on the implementation issues and challenges of co-management of fisheries and SSF guidelines, and developed recommendations for the improved management of SSF to ensure improved resilience of the ecosystems and fishing communities that are reliant on small-scale fisheries in Bangladesh.

## 2 Introduction

Small-scale fisheries (SSF) in Bangladesh can be described by the term 'artisanal fisheries' as it often used to specify the fisheries that are small-scale in their nature. The artisanal fisheries in Bangladesh including rivers (479,735 ha), estuarine areas (551,828 ha), permanent and semi-permanent filled depressions (Beel and Haor: 114,161 ha), inundated floodplains (5,486,609 ha) mangrove ecosystem, Kaptai lake, as well as coastal and inshore waters up to 40 m depth. These fisheries are critically important and inherently complex in nature and playing vital roles in ensuring food security, income and employment to millions of people. Of these fisheries, inland fisheries sector of Bangladesh is one of the richest fishery resources in the world and ranked as 5<sup>th</sup> in terms of production. Overall, the fishery sector provides full time employment to an estimated 2.0 million fishers; many more are involved in small fish traders, fish transporters, packers and other related activities.

Fisheries sector supply 60% of the most important, cheaper and affordable animal protein sources for the people of Bangladesh. The fishery sector contributes about 1.51% to the total export earning, 3.61% to the GDP and 24.41% to agriculture sector (Department of Fisheries, 2018). In Bangladesh the artisanal coastal sector is the most productive that contributes 83% of volume of the total landings (artisanal 528,997 mt and industrial trawler 108,479 mt). Besides, the consumptive values, non-consumptive values of the fisheries are also immense. Small-scale fishers are engaged in fishing not only as a mean to address their material impoverishment or just an occupation, but also because they value it as an activity that provides satisfaction, pride and as a way of life. Small-scale fisheries offer a rich and satisfying way of life, a sustainable life with an envision for a better future for their children, and a life that allows freedom and the expression of identity is not limited to economic or material values. Small-scale fisheries (hilsa fishery, for example) also part of cultural, religious and heritage value of the nation. While small-scale fisheries are holding diverse values but are facing different threats and pressure. Small-scale fisheries are susceptible to over-fishing (e.g. juvenile and brood hilsa fishing, collection of shrimp PL), damage of habitat by a combination of the blockage of migratory routes, siltation, pollution, illegal use of banned fine-meshed fishing gears, increased numbers of fishers, over capitalization, conflicts over resources and space, climate change and variability and also globalization, to mention a few. These threats and challenges lead to habitat loss, less production and extinction of fishery species that negatively affects the human well-being. According to IUCN (2015), about 36% of inland fish species are threatened due to decline in wetlands. Fishery-based livelihoods have also been threatened by different risks and pressures. Usually, small-scale fishers work and live

in risky environments, with poorly defined property rights in fishing zones and muted voice and poor representation in policy arenas: they remain poor and powerless and are in a constant struggle for survival in settings beyond their control.

Small-scale fisheries are connected to natural, social and political processes that occur outside the domain of a 'fisheries system'. This connection highlights the importance of employing transdisciplinary research approach to tackle the complexities of SSF governance. The natural and social system of SSF often goes beyond the maritime boundaries of the nation states. This necessitates the study SSF through transboundary fisheries lens (e.g. with aspects straddling stock dynamics, political economy, and international laws and conventions). Coastal small-scale fishers mostly live on sea front side, thus they are most likely vulnerable to sea-borne disasters, especially those living in low-lying areas, are highly susceptible to climate change impacts, consequently they remain at disaster risk. SSF in Bangladesh also faces a number of other stressors including population expansion, expanding aquaculture in fishery habitat, conflicts with agriculture practices, establishment of marine protected areas, the emergence of marine based industries and development projects and rising demands of seafood products have contributed to intense competition within coastal space and marine and inland waterscape, that negatively affect small-scale fishers who depend heavily on access to common pool resources. The open-access fisheries in Bangladesh resembles the characteristics of "common-pool resources" where property rights are not clearly defined. The voice of these fishers is often muted or unheard of and their rights are frequently violated by economically and politically powerful elite people. A major section of small-scale fishers is landless, live on government-owned khas land, they face constant threats of displacement from privatization of khas land, or river erosion. That warrants right-based fisheries management for small-scale fishing people.

Fisheries in Bangladesh are in transition for several reasons. Firstly, in the context of the recent development in the maritime boundary with neighboring countries, blue economy concept recently became a buzzword and attracted much attention from policymakers for a sustainable development. SSF certainly forms an important component of 'blue growth' agenda. Secondly, Bangladesh also embarked on achieving the UN Sustainable Development Goals (SDGs) by 2030. Among the 17 SDGs, SDG 14 is about conservation, sustainability and use of oceans, seas and marine resources for increasing economic benefits. The SDG 14b, has raised the profile of small-scale fisheries through a target that calls for the provision of 'access of small-scale artisanal fishers to marine resources and markets'. Thirdly, the Bangladesh government is in preparation of country's first marine policy. Consequently, Bangladesh's fisheries now sit at a potential cross-road in terms of updating the profiles of small-scale fisheries which are traditionally neglected by both policy makers and researchers.

Although small-scale fisheries is an important agrarian activity in Bangladesh and they exists in all possible aquatic environments and involve about 10% of its population directly or indirectly. But there is clear lack of integrated knowledge about the sector. There has been little coordinated effort in Bangladesh to systematically and routinely collect data about SSF. Through recently there is a positive trend, but it is still far from sufficient to illustrate the contribution of SSF towards nutrition, food security, sustainable livelihoods and poverty alleviation and rural development. The Small-scale Fisheries Symposium 2019 aims at producing a broad view of the current state of knowledge on governance, ecosystem health, livelihoods, production and supply chains across Bangladesh small-scale fisheries sector. The **symposium aims to** gather researchers, academician, NGO workers, practitioners and policy makers who have stake in small-scale fisheries in Bangladesh. The output of the symposium will help to raise public awareness and political will for SSF development as well as will stimulate collective research agenda on SSF. This symposium will be a right step forward to identify future research and policy directions towards sustainability of SSF, also blue growth agenda and SDGs.

### 3 Keynote Presentation

Dr. Md. Abdul Wahab, Team Leader, ECOFISH-BD project presided over the keynote presentation session. He welcomed everybody and conducted the self-introduction session. After introducing the agenda, the Chairman briefed the background highlighting the importance of the workshop. The Chairman then invited everyone to take a look at the keynote presentation by Dr. MAR Hossain, Professor, BAU on 'Small Scale Fisheries Resources and its Biodiversity in Bangladesh'. Dr. Hossain elaborately presented all aspects of SSF resources highlighting the following (Annexure 2):

#### ***General issues regarding SSF resources***

- Concept of small-scale fisheries (SSF)
- Key ecosystem/water areas covered and production from SSF
- Species diversity under SSF
- Compositions (%) of major fauna in the SSF catch
- Status of species as per IUCN Red List 2015
- Causes of declining fish biodiversity in the SSF areas and highlighted the following:

#### ***Degradation caused by climatic and anthropogenic reasons***

- ✓ Ground water sinking and contamination
- ✓ Surface water squeezing and pollution
- ✓ Encroachment of rivers and other water bodies
- ✓ Change of bio-physico-chemical properties of water
- ✓ Spatial loss of open water due to siltation
- ✓ Overall production system in fisheries and aquaculture affected
- ✓ Loss of biodiversity
- ✓ Considerable damages of wetlands and forests

#### ***Direct impacts on fish biology & dynamics***

- Effect in reproduction and growth of fish
- Changes in Species composition, abundance and distribution
- Effects on aquaculture
- Impacts on habitat quality and migration
- Habitability area changes
- Effect on marine fisheries

Finally, the presenter pointed out that only eco-friendly improved and innovative management practices with insights on technological, environmental and socioeconomic concerns can ensure sustainable SSF. Specifically, he recommended the following activities for SSF improvement in Bangladesh:

- Restoration SSF habitats
- Establish SSF sanctuaries and fish pass
- Enhance SSF stocks in floodplains
- Creating social awareness through mass media, printed materials and social mobilization
- Rationally use of pesticides, inorganic fertilizers and properly manage industrial effluents
- Maintain minimum 1 m water depth during water extraction from critical waterbodies
- Regulate selective fishing gears, mesh sizes, and fishing by dewatering
- Establish natural Beel nurseries

- Maintain zero tolerance to new exotic fish introduction
- Strictly apply existing fisheries rules and regulations
- Adopt community-led fish catch monitoring system to track biodiversity
- Implement FAO's Voluntary Guidelines for sustainable SSF
- Initiate collaborative R & D 'core projects' on SSF conservation involving all stakeholders
- Set-up a national SSF conservation and germ plasm center

### Discussion on keynote presentation

Invited guests and other participants actively participated in the discussion regarding the keynote presentation and other issues related to SSF and suggested various measures for its sustainable development (Table 1).

**Table 1** Summary of the suggestions and recommendations obtained from discussion on keynote presentations of the SSF symposium 2019

Discussant	Major comments/suggestions
Mr. Renerio Acosta Economic Growth Office, USAID, Bangladesh	SSF is the most important sector that contribute in fish production and employment generation. Globally about two-third of the total fish production produced from the SSF sector. For the improvement of this sector, three important points need to be considered carefully. These are, subsistence fisheries, equity and community participations. For the development of this sector, an integration of traditional and commercial aspects is very important. For its sustainable management, EAFM-Ecosystem wellbeing, good governance and human wellbeing need to be ensured.
Ms Masud Ara Momi Project Director ECOFISH-BD Project Department of Fisheries	Department of Fisheries is delighted to be a part of the SSF activities. In fact, hilsa is the main SSF species that get our most management attention. SSF is a part of heritage of Bangladesh, but siltation and pollution are adversely affecting the SSF sector, so, we need to overcome those problems for its sustainable management.
Dr. Philippa Cohen SSF Program Leader WorldFish, Headquarters Penang, Malaysia	<p>Micronutrients play very important roles in our physiology and SSF is the main source of micronutrient rich fish. Dr. Cohen enriched her argument through a presentation entitled 'Resilient small-scale fisheries; beyond protein, production &amp; pessimism'. It's an important time for small-scale fisheries as we move towards achieving the SDG target year of 2030 comes into sharp focus. We could argue that we are seeing SSF gain unprecedented attention and commitment. For example, with explicit mention in Sustainable Development Goal 14B and explicit focus on fisheries, marine and freshwater systems within four other SDGs.</p> <p>Malnutrition can result from a lack of calories, but malnutrition can also result from a lack of micronutrients – this is Hidden Hunger – the consequences of which are severe for individuals and for whole societies. Fortunately, the fishes landed in Bangladesh show the third highest concentrations of iron &amp; second highest concentrations of zinc.</p>

	<p>SSF offer vast benefits to society including economic stability and growth, improving food/nutrition security. The loss of these benefits through external drivers, inappropriate governance reforms or ecological demise would introduce millions of people to new levels of poverty, food insecurity and vulnerability.</p> <p>We look forward to addressing these challenges together with this vibrant and committed research community.</p>
<p>Dr. Md. Abdul Wahab Team Leader ECOFISH-BD Project &amp; Session Chairman</p>	<p>For SSF improvement, habitat restoration through reclaiming main rivers, secondary &amp; tertiary rivers, Beel and Canals to re-establish coastal ecosystem. Hilsa juveniles in the rivers could be used as food by catfishes. In coastal and marine waters, hilsa may be served as food for dolphins and other carnivore fishes. All the other SSF habitats like Beel, Baor, Haor and canals need also be managed sustainably.</p> <p>Through this SSF symposium, a new avenue to work together involving, researchers, administrators, extension workers, developers, from government and non-government organizations, universities, as well as fishers and other stakeholders has been opened and the efforts will be continued in future. Finally, the Chairman thanked all the participants, guest and keynote speakers and concluded the session.</p>

#### 4 Technical Sessions

The technical session was presided over by Dr. Philippa Cohen, SSF Program Leader, WorldFish, Headquarters, Penang, Malaysia. A total of seven papers were presented covering a wide range of areas of SSF (Table 2). After the presentation, all participants actively participated in discussion about the various presentations related topics as well as SSF in general focusing on the future activities for its improvement.

**Table 2** Summary of the presentations presented in the technical session of the SSF symposium 2019

Presenter	Title	Focus Areas
Dr. M. Mukhlesur Rahman, Executive Director CNRS, Bangladesh	Small-Scale Fisheries in Bangladesh Large attributes, Larger Issues and Largest Opportunities	Beel and Floodplain resources and their contribution to the fish production and nutrition, status of Hail Haor and Chalan Beel, Baikka Beel National Sanctuary, Hail Haor: Biodiversity conservation
AKM Firoz Khan, Project Leader, HILIP/CALIP, WorldFish	Haor fishery resources and its management in the Northeast region of Bangladesh	Haor Fisheries Resources Management, New Fisheries Management Policy

		<p>Open Access of Open Water Fisheries</p> <p>Reservation of Small Jalmahals for Youth Groups</p> <p>National Fisheries Policy</p>
Dr. Md. Jalilur Rahman, ECOFISH-Bangladesh, WorldFish	Fisheries in the GBM River Systems: its potentials and challenges for development	<p>Past and present riverine coverage</p> <p>Services from riverine ecosystem</p> <p>Riverine biodiversity focusing fish</p> <p>Contribution of riverine fish</p> <p>Livelihood depends on rivers</p> <p>Challenges/problems for riverine habitats</p> <p>Measures to overcome the challenges</p>
Dr. M. Shahadat Hossain, Professor, IFMS, Chattagram University	Status of coastal and marine artisanal fisheries of the Bay of Bengal and its potential for sustainable development and utilization	<p>Marine fishing zones, catch and efforts, Major challenges for managing coastal and marine SSF sustainably: Scientific knowledge generation in fisheries</p> <p>Sea surface temperature (SST)</p> <p>ENSO (El Niño Southern Oscillation)</p> <p>IOD (Indian Ocean Dipole)</p> <p>Ocean acidification</p> <p>Freshwater plume</p> <p>Microplastic pollution</p> <p>Low-oxygen/dead zones in the ocean</p> <p>Necessary interventions: Fisheries co-management</p> <p>Post-harvesting processing</p> <p>Limiting fishing efforts</p> <p>Developing safety of fishermen at sea</p>

		<p>Stock assessment</p> <p>Identification of breeding/nursery grounds and migration routes</p> <p>Control/reduce pollution</p> <p>Restore marine ecosystem health</p>
Dr. Abdul Wahab, Team Leader, ECOFISH, WorldFish	Revival of Hilsa Shad Fishery in the Meghna-Padma River Systems - A Closer Look into the Innovations	<p>Socioeconomics and nutritional importance of hilsa, HFMAP implementation and its impact</p> <p>Details of ECOFISH interventions and its impacts, highlighting, scientific information generation, co-management, livelihood support to fishers and policy support for hilsa management. Finally, visible impact of ECOFISH interventions like hilsa, production and size improvement, catfish biodiversity improvement, fishers' income improvement and so on.</p>
Dr. Mahmudul Islam, Assistant Professor, Sylhet Agricultural University	FAO-Small Scale Fisheries Guidelines: Implementation Challenges	<p>Importance of Small-scale fisheries (SSF)</p> <p>Step-zero of the SSF Guidelines</p> <p>Contents of the SSF Guidelines</p> <p>'Good Practice' example of SSF Guidelines implementation</p> <p>Implementation challenges</p> <p>Way forward</p>

### Open Discussion on Technical Session

A number of participants actively participated in the discussion regarding the presentations presented in the Technical Session and provided various suggestions and recommendations. Important comments and recommendations provided by the participants are summarized in Table 3.

**Table 3** Summary of the outcomes obtained from the open discussions on the technical session presentations of the SSF symposium 2019

Discussant	Major comments/suggestions
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Mr. Naseem Aleem DCOP, BANA, WorldFish	As the water bodies are increasingly becoming polluted and areas also been reduced, we should think and decide whether we should expand our activities towards aquaculture or fisheries.
Dr. Anisul Haque Professor, Khulna University	We should identify the real owner of the inland water bodies and the owner should take responsibilities for its management.
Mr. Md. Khalequzzaman DFO, Cox's Bazar	Community based organization (CBO) is very important for fisheries management, but we cannot control the open-water fishery, so may practice cage culture. We need to control pollution from rivers.
Md. Sultan Ahmed Deputy Director, Sylhet	ECOFISH is successfully conducting in hilsa management activities and providing AIGA support for fishers. Similar activities and support may be provided for Haor management in Sylhet.
Mr. Masud Siddiqui CNRS, Dhaka	We should not erect any wall between aquaculture and fisheries, and both should be improved side by side.
Dr. M. Niamul Naser Professor Dhaka University	Water flow from the up-stream rivers are being reduced alarmingly, so to keep the migratory route open and hence to get enhanced riverine fish production, dredging need to be done regularly.
Dr. Mrittunjoy Kunda Professor, Sylhet Agricultural University	Water body leasing system creating problems for fisheries management, so, leasing system should be abolished.
Dr. M. Ashraful Islam Senior Scientific Officer BFRI	We need to find out why fish concentration in SONG and other fishing grounds than other areas. Catch data (CPUE) need to be standardized.
Dr. Abdullah-Al-Mamun Professor, Noakhali STU	Hilsa production improved but improper distribution of the profit need to be minimized for the betterment of fishers



**Group Discussion**

Four groups were formed with all participants for four thematic areas related to Small-scale Fisheries. In each group, for their given SSF area, following three questions were asked.

*1. What are the priority actions/ investments/ initiatives needed to improve outcomes environmental, food and nutrition security and livelihood outcomes? [where, why, how will this lead to outcomes]*

*2. Where will research [topic, research question, etc) be critical to driving, accelerating or sustaining those outcomes?*

*3. Who will lead this work and research in 2019 and beyond? How will we best work together, where will working together be greater than the sum of the parts? What structures, policies, and institutions can we build on?*

#### **Group 4: Small-scale Fisheries Research & Development Issue**

The group identified following researchable issues for SSF of Bangladesh

- Resource Identification- Species, ecosystems  
Definition, Scope, Present status, trends, Review of data etc
- Categorize the resources -  
Ecosystem, Organization, Stakeholders, Crafts and gears etc
- Review of existing and past projects on SSF  
(National and International)
- Biology and Ecological issue of fishes and OAA under SSF  
Lifecycle, seed production, culture, production
- Gaps identification in different ecosystems
- Climate change and anthropological issue affecting SSF -  
Climate change, pollution, habitat destruction, overfishing, water abstraction, encroachment etc.
- Nutrition sensitive SSF – comparison with culture fishery
- Post-harvest loss and prevention
- Value addition – drying, fermenting and others
- Potential and prospects of SSF
- Risk and hazard of stakeholders – piracy, credit cycles, ban period
- Gender issues, child labour
- Act, laws, policy and guidelines – revision, update

Bangladesh Fisheries Research Institute (BFRI), Universities, and NGOs can lead research on these issues. As expected outcomes, SSF will be properly identified and visualized, SSF Resource will be categorized, and contribution of SSF will be defined. Evaluation of the past projects will provide lesson learned from the past and present research findings as well as future direction will be identified. These findings will lead to sustenance of the SSF biodiversity and production. Effective research on these issues will ultimately lead to policy formulation, Safe food and safe environment, as well as gender equity will be ensured, Socio-economic development will be delivered. The beneficiary will be fisheries stakeholders including vulnerable and marginalized populations such as women and children. Consumers of the fishery products, rural communities as well as policy makers will also be benefited.

### **Group 2: Sustainable Intervention for Gender Inclusive Fisheries Plan**

For Sustainable Intervention for Gender Inclusive Fisheries Plan, four priority plans were selected by the group. The first priority action was 'Upliftment of Gender Profile' which can be implemented at village level by making 'Village conservation group' with involvement of 30-50 women participants. This intervention will facilitates decision making for equity. For this plan to be doable research should be conducted in several veins such as identification of obstacles and opportunities, Education level and skills, access to finance and social networking skills of the women. The second priority action is 'Awareness building' which can be implemented at grassroots level. This intervention is important for understanding social integration, nutritional knowledge and hidden hunger. The expected outcomes can be achieved through group meeting and training of man and women. Some Research issues were identified that includes conservation issues, nutritional values, natural resources, biodiversity and threats. 'Mainstreaming Gender' is the third priority action plan which needs to be implemented in all SSF fishing villages, this will make balance between decision making and implementation. To make this action plan doable, relevant laws and rules needs to be created. For this action plan, research should be done on identification of bottlenecks and potentials and identification of level of participation of women in the society. 'Better technology for women' is the final priority action which needs to be implemented through training at rural level for technological enhancement and skill development. Research needs to be done on to indentify village specific need-based technology, financial requirement and credit mechanism. To implemented all four priority action plan strong fisheries extension systems / agencies, involvement of GOs and NGOs, local elite are necessary. Bangladesh Fisheries Research Institute, Department of Fisheries and Universities can lead the research

### **Group-3: Fishers Access to Resources and Tenure Rights**

Resources are mainly three types that can be considered as Small-scale fisheries such as artisanal fisheries, river fisheries and beels and floodplain fisheries. Several barriers were indentified including Policy gaps, lack of institutional integration and coordination and financial vulnerability. Policy gaps mainly related to fisheries delimitation, elite interference and overlapping of fisheries areas Institutional integration and coordination barriers related to lack of coordination among government agencies, capacity development, no effective networks. Barriers related financial vulnerabilities are dependency on middleman, financial supports by DoF, Bank

#### **Group 4: Resilience Livelihoods of the Coastal Small Scale Fishers**

The group identified a number of elements that can contribute to resilience of coastal small-scale fishers. These elements include:

- a. Alternative livelihoods option (off-farm and on-farm)
- b. Networking
- c. Ecotourism development
- d. Cooperative development for fund raising
- e. Co-management group formation
- f. Access to finance and gov. incentives
- g. Health and education
- h. insurance (life and property)
- i. Ecosystem conservation/ restoration
- j. Nutritional knowledge/awareness
- k. Designated harbor areas
- l. Licensing and id card
- m. Fixing fishers and efforts

Towards materializing these elements of resilience, the group also suggested several interventions for policy implications. These strategies include women empowerment and involvement through need-based AIG supports, capacity building, network mapping (both intra and inter community), facilitation of development and dissemination of materials, group development considering interest and capacity, involvement of relevant stakeholders, formation of legal instrument, awareness and capacity building. Research on coastal fishers' resilience could lead by academicians, research organization on short term and long term basis. Policy matters could be dealt by Department of Fisheries, Ministry of Law, where extension of research could be done by Department of Fisheries, NGOs, private entrepreneurs.

In the final comments, Pip Cohen commented Small-scale fisheries has image problem, so donors are interested in another sectors, thus images of SSF needs to be improved. There are challenges but benefits are many. Bangladesh has so much learning that can be shared to learn by other as opportunity. She appreciated the cohort of the researcher present in the symposium. She asked researcher to join together to work on lots of information and learning to show success of Bangladesh SSF, not lead by foreign researchers. This group could build knowledge for next generation. WorldFish could support this endeavor.

## Summary of Recommendations and Comments

- Mesh-size for Hilsa gillnet should be 5.5. cm and 10-15% Jatka should be allowed
- In marine, 8-9 cm, in Bhola 7.0 cm, in Barishal 6.5 cm and in Chandpur 5.5 cm are appropriate, so, in an average 6.0 cm can be recommended
- If large mesh-size be used, that will be good for fishers as they will get large Hilsa in the waters
- Mesh-size for Hilsa gillnet should be between 5.0 cm and 6.0. cm
- The mesh size that fishers accept should be selected
- Mesh size should be 7.0 cm, but inland fishers should get the opportunity to change the net
- Such mesh size should be selected through which Jatka can be escaped
- Mesh size 7.0 cm would be too large and 4.5 cm would be too small, so, 6.5 cm could be selected as the most appropriate
- Present trawl mesh-size in the cod-end is 6.0 cm, but substantial quantity of Jatka have been caught by this mesh size, so, mesh size should be 7.0 cm
- To provide the opportunity to spawn once in its life time, mesh-size should be 6.0cm -7.0 cm.
- Mesh size should be larger than 6.0 cm and 7.0 cm would be the best
- It is very difficult to change the rules, so, we should think before amending the rules for its long time use, and mesh size should be 7.0 cm
- River Police will help in implementing the mesh-size regulation whatever the size we select, but Fishery Officers should be able to identify the legal or illegal mesh size

## Conclusions

Improvement activities for both aquaculture and fisheries should run side by side to ensure sustainable fish production.