

# The changing face of women for small-scale aquaculture development in rural Bangladesh

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Bangladesh is considered one of the most suitable countries in the world for freshwater aquaculture, because of its favourable resources and agro-climatic conditions. A sub-tropical climate and vast areas of shallow water provide ideal conditions for fish production. Over the last decade, there has been a dramatic increase in inland freshwater aquaculture production in Bangladesh, growing at an average annual rate of nearly 20%<sup>1</sup>. Around 400,000 ha of freshwater ponds and ditches are used for aquaculture and more than 900,000 households are involved in aquaculture activities<sup>2</sup>. Conditions are highly favourable for the rapid expansion of aquaculture. This is mainly due to the recent rapid advances in seed and feed production. The total annual fish production in Bangladesh was estimated at 2.44 million tons in 2007 of which 945,812 tons (39% of the total production) were obtained from freshwater aquaculture<sup>3</sup>. The main production systems for freshwater aquaculture in Bangladesh are extensive and semi-intensive pond polyculture of Indian major carps and exotic carps which accounts for 80% of the total freshwater aquaculture production. The remaining 20% are mainly from prawn, catfish, tilapia, small indigenous fish and rice-fish farming<sup>2</sup>.

It is changing the face of rural Bangladesh through small-scale aquaculture development, and a large number of rural women are involved in various aspects of aquaculture activities. Traditionally, the work of women in rural Bangladesh is mostly confined to the homestead due to cultural, religious and social restrictions. Generally, household management in rural communities vest in the male head of the family and female members of the family depend upon the earnings of men. As such, almost all economic decisions are ordinarily done by men. There have, however, been more recent changes in the attitude of the people towards the role of women in various aspects of household decision making, household management, economic decision and income generating activities<sup>4</sup>, and a number of activities associated with freshwater aquaculture increasingly involve women. The women have been involved in small-scale aquaculture in different stages of operation. They are active caretakers of fish in homestead ponds, nurseries, cages and even in rice fields. Despite the fact that their role in aquaculture growth has not been sufficiently recognised and



remains inadequately addressed. It is therefore necessary to understand related issues and develop gender sensitive interventions in aquaculture for their empowerment.

This study seeks to broadly understand the role of women in small-scale aquaculture. It is assumed that women's empowerment can be enhanced through their active participation in aquaculture. The aim of this paper is therefore to describe linking women's empowerment and their participation in aquaculture. This description is based on published sources, together with the results of primary data collected in rural Bangladesh.

## Methodology

The study was conducted in the Mymensingh area of north-central Bangladesh. Geographically, Mymensingh has been identified as the most important and promising area for freshwater aquaculture because of favourable resources and climatic conditions, including the availability of hatchery-produced fry, low-lying agricultural land, pond, warm climate, fertile soil, and cheap and abundant labour. The soil, water and climate support high levels of aquaculture production, and thus, about 40% of the country's aquaculture production comes from the greater Mymensingh area<sup>5</sup>. Small-scale freshwater aquaculture has benefited especially from sustained efforts in a major long-running development project, namely Mymensingh Aquaculture Extension Project (MAEP) - funded by Danish International Development Assistance. A

large number of farmers including women received training in fish farming through MAEP. As a result, there has been a dramatic increase in fish production over the last few years.

A wide range of tools can be used for data collection to obtain a broad and in-depth understanding of women's participation in aquaculture. A combination of participatory, qualitative and quantitative methods were used for primary data collection (Figure 1). Data were collected for a period of six months from



*Carrying fish feed from the market.*



*Feeding the fish.*



*Helping with the harvesting.*

July to December 2007. The participatory rural appraisal tool focus group discussion (FGD) was conducted with women farmers (i.e. farmers' wives). A total of 20 FGD sessions were conducted in Phulpur sub-district under Mymensingh district where each group consisted of 8 to 12 women (total 192) and the duration of each session was approximately two hours. FGD was used to solicit an overview of women's participation in small-scale aquaculture activities. Questionnaire interviews with women were preceded by preparation and testing of the questionnaire and training of enumerators. A total of 100 women were interviewed in their houses and/or farm sites. Women were selected through simple random sampling. Several visits were made to selected women for observation of aquaculture practices. The interviews, lasting about an hour, focused on their involvement in aquaculture activities, constraints and socioeconomic benefits. Cross-check interviews were conducted with 20 key informants, including district and sub-district fisheries officers, local leaders, school teachers, researchers, policymakers and relevant non-government organisation (NGO) workers for the validation of collected information. Data from questionnaire interviews were coded and entered into a database system using Microsoft Excel software for analysis using SPSS (Statistical Package for Social Science) to produce descriptive statistics.

## The role of women in aquaculture

In the study area, the women are involved in various facets of aquaculture activities, including stocking of ponds, feeding of fish, pond management, fertilisation, liming, and



*A girl with harvested fish - high value prawn (Macrobrachium rosenbergii).*

fish harvesting and marketing. Based on a sample of 100 women farmers, it was found that women were involved in aquaculture activities with various degrees of participation (Table 1). According to the survey, the majority of women were regularly involved in feed preparation, feeding of fish, fertilisation, pond supervision and management, and fish harvesting. In general, women provide partial assistance to men in pond supervision and management, by applying feed,



*A baby girl sorting fish with her father (today's girl tomorrow's woman fish farmer).*



*Aquaculture has improved economic power of rural women.*



*Aquaculture income has improved drinking water facilities.*

lime and fertiliser. Most women reported that they managed the pond regularly in two ways: first, most routine operations such as fertilisation and feeding could easily be managed by women, and second, husbands were often busy in other work, away from the home for long hours, and hence the wife had to take the lead role in day-to-day operations. In several cases, harvest of fish for family consumption is done by women with the help of children. Husbands only help when they are at home or when the ponds water is too deep, requiring more specialised gear to be used for fish harvesting. Nevertheless, harvesting of fish for marketing is done by men with commercial harvesters. In that case, women are involved in post-harvest handling including sorting, grading and washing of fish.

Although the women are involved in various aquaculture activities, their participation has been generally limited to fish stocking, transporting and marketing. Men are generally involved in buying of fish fingerlings from hatcheries, stocking ponds and transporting harvested fish to markets. Nevertheless, some advanced women noted that they bought and transported fish feed, fertiliser and lime from markets, which is half a mile to three miles distant from their houses. According to key informants, the women are now more active in many aquaculture activities those were not previously involved.

According to the survey, fish production (an average 4,500 kg/ha/year) has increased 10-20% due to involvement of women. Job opportunities for women have increased since widespread of small-scale aquaculture in the Mymensingh area. The rapid development of the freshwater aquaculture industry has provided employment opportunities for women,



*Icing of fish by a young girl.*

meaning that they are now able to contribute to household income. Even women from the poorest households often work outside the home as paid labourers in fish hatcheries and fish feed industries for their family survival. A few women are involved in weaving fishing nets, a traditional occupation of women. These nets are used for fish harvesting, which has generated increased demand for nets. The result increase in the price of nets has increased their earnings.

Almost all interviewed women stated that small-scale aquaculture activities had increased their workload. The study revealed that women's average daily involvement in fish cultivation was 3.5 hours, ranging from 2 to 6 hours. The women were engaged in aquaculture activities for an average of 27% of their total daily working hours. The women stated that they would like to spend more time in aquaculture because of the high economic return. However, the main constraint was their household work obligations. Based on respondents' descriptions, a woman's day typically begins with cleaning the house; from the morning until late at night she has to wash dishes and clothes, cook food, look after children, carry out homestead gardening, poultry rearing, livestock feeding, fish farming and other agricultural works.

The women's involvement in aquaculture activities is further explored by examining correlations between their human capital and working hours (Table 2). The analysis shows significant positive correlations between involvement in aquaculture and age of women, education level, farming experience and training received. The analysis finds that the age of women is the weakest relationship to involvement in aquaculture among these capitals. In turn, there is a strong positive association between training received and aquaculture participation, followed by education level and

farming experience. Nevertheless, there is a negative association between family size and women involvement in aquaculture, valued at - 0.37, significant at the 10% level.



*Women come forward to participate in development activities outside their homestead.*



*Rural women are typically involved many household works beside aquaculture.*



*Working together in fish harvesting.*



*A girl with harvested vitamin-A enriched mola fish (Amblypharyngodon mola).*

**Table 1. Degree of participation by women in various aquaculture activities (n = 100).**

Activities	Regular participation (%)	Irregular participation (%)	Seldom participation (%)	No participation (%)
Fish stocking	12	23	56	9
Feed preparation	67	28	5	0
Feeding of fish	82	12	6	0
Fertilisation	53	29	12	6
Liming	36	42	12	10
Pond supervision	55	41	4	0
Harvesting	62	21	12	5
Marketing	4	11	48	37

n: sample size of women farmers

## Linking participation and empowerment

The role of women in small-scale aquaculture related activities is potentially very important for their empowerment. A conceptual framework has developed to show linkage between the participation of women in aquaculture and their empowerment (Figure 2). The women involvement in aquaculture provides three basic improvements: economic, nutritional and social benefits, those are assumed to be interlinked in order to empower women. The households of women have improved their income through increased profitability in fish farming. According to the survey, almost all women reported that they have improved their socioeconomic conditions through involvement in aquaculture activities. Such improved conditions can be described on the basis of qualitative indicators, including food consumption, sanitary

and drinking water facilities through tube-wells, improvement of housing structures and children education. Study results suggest that women have broadly improved their standard of living, purchasing power and ability as an economic actor. Women respondents cited several examples of how the standards of living of their families have improved since their participation in aquaculture. Most households reported that they have improved their housing conditions, nutritional benefits, health and sanitary facilities, drinking water facility, children education and recreational items including cell phone, television and radio. Income from fish production offers to engage women in poultry farming, livestock rearing and homestead gardening to supplement their income. Income also provides the opportunity to increase security for coping with uncertain situation, such as illness of household members and natural disasters (i.e. floods, heavy rain and cyclones).

It is recognised by the family and society that women play a significant role in small-scale aquaculture development in the study area. Aquaculture activities of women at village level have enhanced their position in families. Almost all women interviewed noted that their position has improved due to such involvement. They now tend to play a stronger role in economic decisions for the management of their households, including those concerning education of children, attending social functions, inviting guests and attending religious functions. Women's participation in aquaculture has changed the attitudes of family members, including their husbands, mothers-in-laws and other female relatives as their aquaculture activities willingly offer help in meeting their household responsibilities because of increased income through increase fish production. During field visits, it was observed that improved women's status has improved child nutrition because women with greater status have better nutritional status, are better cared for themselves, and provide higher-quality care to their children. According to key informants, the participation of women in aquaculture has increased rural women's mobility and access to markets. They can also get access to better health services, educational opportunities and financial services.

## Women's empowerment: Reality or dream?

The empowerment of women could be the principal strategy to upgrade their status. The most effective ways of empowering rural women and enabling them to move out of poverty will depend on local economic, cultural and political conditions<sup>6</sup>. Moreover, women's empowerment depends on a



Trading fish at an urban market.

range of factors including psychological, cognitive, economic, social and political dimensions<sup>7</sup>. Women’s empowerment may give them greater equity, mobility, more control over resources and political awareness, and thus, reduce incidents of domestic violence<sup>8,9</sup>. The empowerment status of rural women in Bangladesh can be significantly improved by increasing their involvement in income generating activities including aquaculture<sup>10</sup>. Nevertheless, the participation of women in different aspects of aquaculture activities is strongly affected by social, cultural and religious norms. Due to rapid development of small-scale aquaculture in rural Bangladesh, the women are now breaking through the traditional norms and coming forward to participate in the development activities outside their homesteads.

Access to aquaculture resources is one of the elements of women’s empowerment. Resources may be economic (e.g. pond, land and credit), political (participation in local government and community decision-making) and social (education and training)<sup>11</sup>. Poverty alleviation in rural areas is significantly related to women’s increased access to productive resources<sup>12</sup>. Access to productive resources for women enhances knowledge on farm management and income generation, develops bargaining and decision making power, improves children’s schooling and health, increases self-confidence and social networks<sup>13,14</sup>. Rural women’s empowerment can be enhanced through forming social capital by various development activities which could increase productive resources under women’s control<sup>11</sup>. The women

**Table 2. Human capital of women and correlation to participation in aquaculture.**

Variable	Measure	Mean value	Correlation (r value)
Age	Years	32	0.34**
Literacy	Percent	29	0.65***
Family size	Persons	5.8	- 0.37*
Farming experience	Years	5.2	0.59**
Training received	Percent	17	0.71***

Single (\*), double (\*\*) and triple (\*\*\*) denote significant at 10%, 5% and 1% levels, respectively

**Table 3. Strategies for empowering women to be actively involved in aquaculture activities.**

Key Strategies	Women’s empowerment
1. Education	Increase overall knowledge, help decision making, control over resource, more involvement in economic activities including aquaculture
2. Training	Increase technical knowledge on aquaculture, help farm supervision and management, increase farm production
3. Awareness	Self-confidence in aquaculture activities, motivation and inspiration to active participation in aquaculture
4. Credit	Widen economic activities in aquaculture, help to gain independence and improve social status
5. Information	Poverty alleviation through aquaculture, sustainable livelihoods in aquaculture and other income generating activities, human rights, etc
6. Group formation	Participation in local institutions and political process, exchange and sharing knowledge, conflict resolution, bargaining power and gaining freedom

**Figure 1. Methodology followed for field works, data collection and data analysis.**

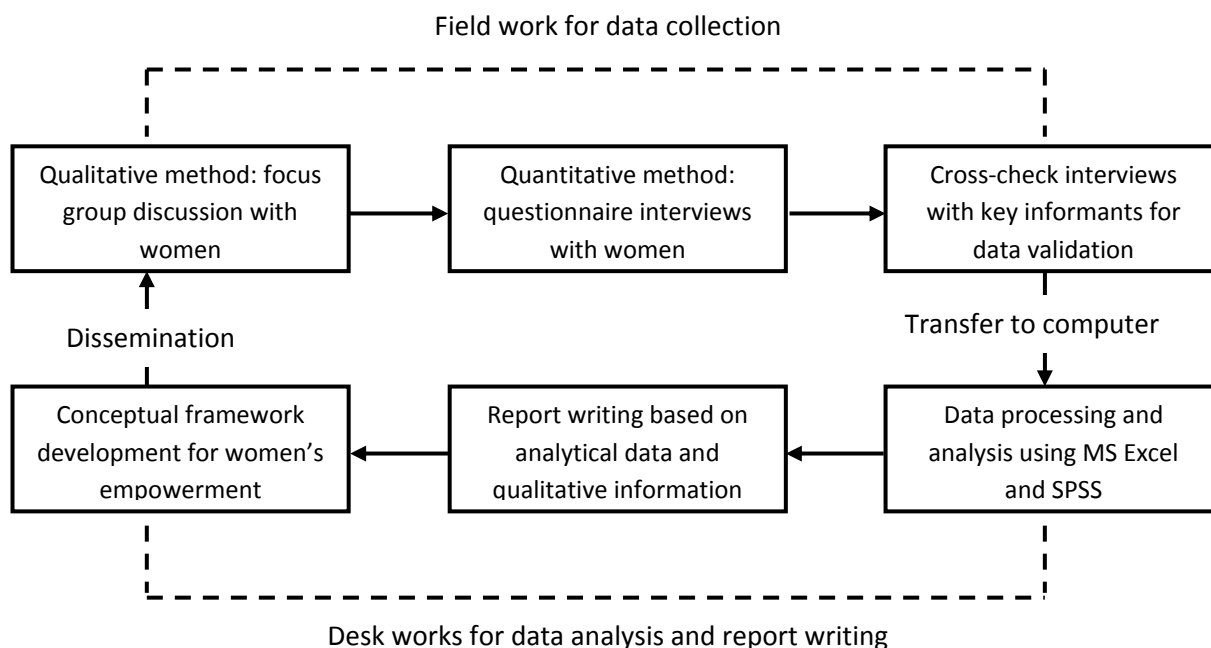
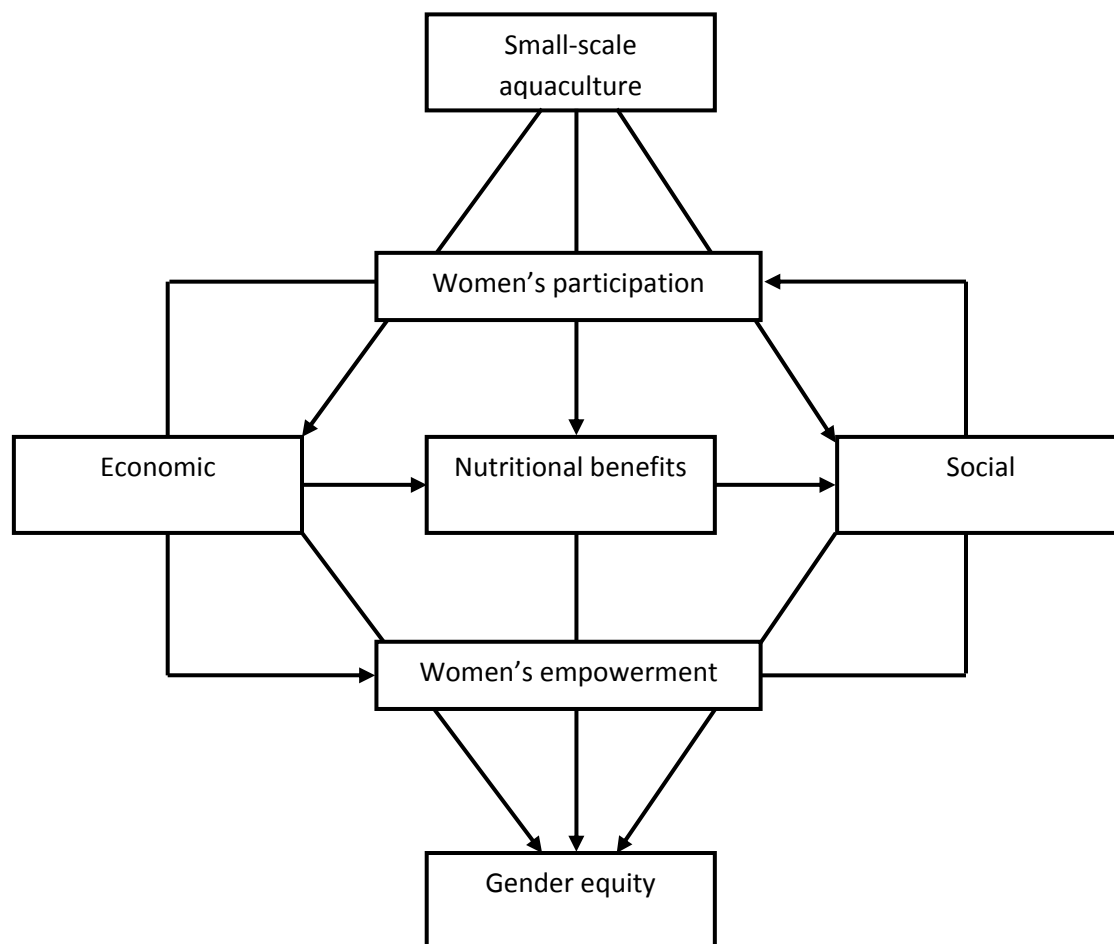


Figure 2. A conceptual framework for empowering women through their participation in aquaculture.



of rural households negotiate their livelihoods by obtaining access to land, pond, labour, capital, knowledge and market, which leads to enhance family well-being and sustainable use of resources<sup>15</sup>.

While there is great potential for increasing family incomes through engaging in aquaculture activities by women, a number of factors might constraint to their active involvement. Despite their tremendous contribution to fish production, rural women are underestimated and overlooked in development strategies. Although women and men are by constitution equal in Bangladesh, the reality is different. There is a gross disparity between women and men in every sphere of life. The underlying problem lies in the sexual division of labour, in which females perform mainly unpaid labour in the home and males perform largely paid labour outside the home. Moreover, the lack of technical knowledge in aquaculture, heavy household tasks and socio-cultural constraints such as mobility restriction hinder women's participation in aquaculture activities. As a result, the level of participation in aquaculture by women in general remains below expectation. There is therefore huge scope to involve women in aquaculture. The active participation of women would have a crucial and positive impact on the social and economic well-being that will ultimately help in reducing poverty and empowering them. If the status of men and women are equalised, women may be empowered, and thus, women's empowerment may operate for improving household incomes through involvement in

aquaculture activities. Table 3 provides some of the strategic measures for empowering women through their involvement in aquaculture activities.

## Conclusions

Increased economic activities leading to income generation opportunities for the rural women are the most important benefits that have resulted from small-scale aquaculture development in rural Bangladesh. Women's growing participation in aquaculture has been a significant indicator of increased empowerment at the household level as well as society. With increased participation in aquaculture, women's socioeconomic conditions within the households and communities have risen significantly. This has begun to change giving women increased decision-making power on household management and income generating activities. However, poverty reduction should be prioritised in the government's intervention programmes for women's development based on dignity and equality to reduce gender discrimination as poverty is the main cause of disparity. With poverty very much a rural phenomenon, women's active participation in aquaculture is crucial to facilitate economic growth and reduce poverty in Bangladesh.

There is much scope for increased participation of women in aquaculture production. Education, training and capacity building are necessary for empowering rural women. Training

might increase their knowledge and skill and may create opportunities of employment and increase income earning for improving their participation in the family decision making process which in turn empower the rural women in their family and society. With the support of local and national governments, NGOs and international organisations, the participation of rural women in aquaculture can be increased through well-planned projects which put emphasis on manpower development at the grassroots level. It may also necessary to establish institutional and policy support, financial support as well as extension services to women for active participation in aquaculture activities.

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### References

1. Muir, J.F., 2003. The future for fisheries: economic performance. Fisheries Sector Review and Future Development Study, Commissioned with the association of the World Bank, DANIDA, USAID, FAO, DFID with the cooperation of the Bangladesh Ministry of Fisheries and Livestock and the Department of Fisheries, Dhaka, Bangladesh.
2. ADB. 2005. An evaluation of small-scale freshwater rural aquaculture development for poverty reduction. Asian Development Bank (ADB), 6 ADB Avenue, Mandaluyong City, Manila, Philippines.
3. DOF. 2008. Fishery statistical yearbook of Bangladesh. Fisheries Resources Survey System, Department of Fisheries (DOF), Ministry of Fisheries and Livestock, Dhaka, Bangladesh.
4. Ahmed, N., 2005. The role of women in freshwater prawn farming in southwest Bangladesh. *Fish Farmer* 28(2):14-16.
5. Winrock International. 2004. Mymensingh aquaculture extension component impact evaluation study. Winrock International, Dhaka, Bangladesh.
6. Parveen, S., 2007. Gender awareness of rural women in Bangladesh. *Journal of International Women's Studies* 9(1):253-269.
7. Stromquist, P.N., 1995. The theoretical and practical bases for empowerment. In: *Women, Education and Empowerment: Pathways towards Autonomy* (ed. C. Medel-Añonuevo), pp 13-22, UNESCO Institute for Education, Hamburg, Germany.
8. Hoque, M. and Itohara, Y., 2008. Participation and decision making role of rural women in economic activities: a comprehensive study for members and non-members of the micro-credit organisations in Bangladesh. *Journal of Social Sciences* 4(3):229-236.
9. Quisumbing, A.R., 2008. Reducing poverty and hunger in Asia: women's status and the changing nature of rural livelihoods in Asia. 2020 Vision for Food, Agriculture and the Environment, Focus 15, International Food Policy Research Institute, Washington DC, USA.
10. Rahman, M.H. and Naoroze, K., 2007. Women's empowerment through participation in aquaculture: experience of a large-scale technology demonstration project in Bangladesh. *Journal of Social Science* 3(4):164-171.
11. Parveen, S., 2008. Access of rural women to productive resources in Bangladesh: a pillar for promoting their empowerment. *International Journal of Rural Studies* 15:1-8.
12. Adereti, F.O., 2005. Rural women's access to and control over productive resources: implications for poverty alleviation among Osun-State rural women, Nigeria. *Journal of Human Ecology* 18(3):225-230.
13. Grace, J., 2005. Who owns the farm? Rural women's access to land and livestock. *Afghanistan Research and Evaluation Unit*, Kabul, Afghanistan.
14. Pitt, M.M., Khandker, S.R. and Cartwright, J., 2006. Empowering women with micro finance: evidence from Bangladesh. *Economic Development and Cultural Change* 54(4): 791-831.
15. Valdivia, C. and Gilles, J., 2001. Gender and resource management: households and groups, strategies and transitions. *Agriculture and Human Value* 18(1):5-9.

## Strengthening capacity of small holder ASEAN aquaculture farmers for competitive and sustainable aquaculture

Globally aquaculture is recognised as the most rapidly growing food production sector with an average growth of 8%. More than 90% of the global aquaculture production is contributed by Asia and more than 90% of this production is reported to be produced by the small scale aquaculture farmers. However, globalisation is changing the way commodities are traded and small farmers are largely unorganised, sometimes being illiterate or not adequately literate enough to deal with the increasing restrictions being imposed, they are confronted with many challenges. The ASEAN foundation has the mission of helping farmers of ASEAN countries to improve their livelihoods by improving not only husbandry practices, but also enhancing their entrepreneurship that would help them to improve their livelihoods.

In ASEAN countries, aquaculture is an important activity and millions of small farmers are engaged in this activity to earn their livelihood. Fish being a major animal protein source in

ASEAN countries, greater importance is attached to ensure healthy fish and its products availability to all sections of the population. Recognising the importance of aquaculture in the region the ASEAN Foundation has supported the project "Strengthening the capacity of small holder ASEAN farmers for competitive and sustainable aquaculture" through NACA to accomplish the ASEAN vision of 2020. The project has the objectives to improve the competitiveness of ASEAN aquaculture small holders in the domestic, regional and global markets, to improve sustainability of their farming systems, to make them adopt responsible farming practices and improve their profitability.

Five ASEAN countries, namely, Cambodia, Indonesia, Philippines, Thailand and Vietnam were chosen as the representative countries for implementation of the project. Following the inception workshop, based on the interest expressed by each of the countries, following five commodities have been chosen in five different countries