

**Final Report**  
on  
**Study to Determine "Common Service Activities, Technological and  
Environmental Interventions Requirement for Aquaculture and Fish Hatchery Sub  
sector"**  
**(Package no: PKSf/SEP /S-13.3(R)).**

**Submitted to**  
Palli Karma-Sahayak Foundation (PKSF)

Submitted by  
Dr. Syed Arif Azad  
Consultant

Dhaka, 18 March 2021

## Executive Summary

The study “Study to Determine "Common Service Activities, Technological and Environmental Interventions Requirement for Aquaculture and Fish Hatchery Sub sector (Package no: PKSf/SEP /S-13.3(R))” was conducted to determine common service activities, technological and environmental interventions requirement for aquaculture and fish hatchery sub-sector. The study also emphasised on identifying and describing common services which are required to support the micro enterprises, identifying technological interventions required for this sub-sector, describing the current environmental scenario, identifying the environmental negative externalities as well as possible remedial measures and developing the value chain for that subsectors.

To understand existing aquaculture farming and business, related literatures were reviewed. Based on the pattern of farming practices dominated by carp and other fish species the farming areas were categorized into seven different clusters namely Jashore, Satkhira, Cumilla, Chattogram, Cox’s Bazar, Mymensingh and Rajshahi. The analyses were done based on data collected from stakeholders comprises fish farmers, buyers, associations, input suppliers, support services such as designer, machine suppliers, local people, environment specialist and sector experts. The data broadly included product, sector/cluster map and value chain, historical perspectives, entrepreneurship, certification/registration, traceability, revenue and non-revenue generating common physical activities and services, eco-labeling and access to premium market, production and technologies, environment, policy, human resources, financing, profitability, and major constraints.

Data from 94 value chain actors and 61 employed people (staff and labor) was collected through questionnaire interviews. The questionnaire is consisted of both quantitative and qualitative information. Moreover, a total of 42 KIIs and 10 FGDs were conducted to collect qualitative data. Qualitative data were documented in the MS Word. Quantitative data analysis was done using MS Excel. Descriptive analyses were mainly done for this study.

Most of the fish hatcheries are located in Jashore cluster. A semi-improved farming system was also found in this cluster. The Satkhira cluster is dominated by shrimp and crab farming. A number of tilapia and fish hatcheries are also found in this cluster. The shrimp seed is produced by the shrimp hatcheries which are located far away at Cox’s Bazar. Cumilla is the cluster known as flood plain area and the leading species in the cluster includes Indian major carp, pangas and tilapia. Direct fish seed sales from hatcheries have been increasing day by day and according to the farmers, this is more trustable source for quality seed. Chattogram cluster is basically pond based aquaculture. The farmers buy fish seed, this is lion share, from fry traders, and the rest is directly from nurseries. Cox’s Bazar cluster described existing status of sea weed and crablet production and its potential. Rajshahi cluster is dominated by advance major carp and tilapia farming. The farmers stock larger size of fish as seed in pond. This gives the farmers a quick return and they harvest big size of carp. They transport live fish, is the recent tradition to get higher price. Mymensingh cluster is economically rich lead by fish hatchery and improved fish culture system, mostly catfish. A huge numbers of fry traders are engaged selling fish seed. The entrepreneurs in this cluster are also early adaptor of the latest fish technologies introduced by BFRI.

It was observed through the study that the majority of owners of the hatcheries were comparatively rich in education. Although few nursery owners were graduates, most of them completed secondary level education. Majority of them have had been trained on nursery management and improved fish farming. Majority of the fry traders are illiterate. They are professionally experienced as their family were also engaged in fish farming. Most of the farmers are the members of different savings groups under NGO activities.

It was observed that the DoF is the certification authority for hatchery and fish feed business and Fish Inspection and Quality Control (FIQC) officer of DoF is authorized for certification and quality control of ice factory business, fish depot operation, auction centre operation and business of fish processing factory.

Very few people in the industry were found aware of environmental issues. Some NGOs, however, organize some events on this, but in a limited scale. According to Department of Environment (DoE), certification of environment is necessary before starting a fish farming or related business.

Except shrimp, no traceability initiative was found. This was initiated as prerequisite of export of the shrimp. Although crab is also exported, no traceability initiative was found. However, the DoF and Bangladesh Frozen Foods Exporters Association (BFFEA) maintain paper-based traceability system as process of export prerequisite. Some initiatives of e-traceability of shrimp were undertaken but they did not sustain.

Most of the non-revenue generating activities related to fisheries were operated by DoF, followed by other departments of the government like LGED and Department of Social Welfare. Similar types of services like union digital centre and local extension agent for fisheries (LEAF) were also providing services. Different NGOs and INGOs have been delivering training. Moreover, webpage related to fisheries were widely accessible to all of fish entrepreneurs. New technology services are enjoyed mainly due to the presence of BFRI as well. Solar power was seen the system what had insignificant impact on environment but important to different fish business like hatchery, nursery and farming where electric or diesel operated pump was used.

The common market place was the non-revenue generating physical activities, were found in each of the clusters. Testing labs were available in most of the clusters. Government and NGOs were the main non-revenue generating physical service providers in the clusters. A significant number of projects were funded by the PKSf as well. There were waste management and recycling system being operated by biofloc owners in Chattogram cluster. They were basically fish farmers, educated, rich and social worker at a time. The initiative has been helping environment protecting from pollution.

Transportation system was very much common revenue generating common service found under this study. A significant number of plastic items were used from fish harvesting to retailing. Local and national industries have been playing a significant role in delivering the products in time placing importance to keep fish quality. Oxygen supply for fish seed transportation was another technology. Most of the suppliers were poorly educated and came from low-medium earning families. Other groups of local business people were found who used to supply water pump, electric motor, generator and IPS to the advanced fish farms, hatcheries and nurseries. Local machinery workshop owners were also supporting in the process. The local financial institutions, local clubs and associations and Mohajan were supporting majority of fish stakeholders through financing. Brood supply to the hatchery was identified as potential revenue generating common services.

According to DoE, certification of environment seemed necessary before starting a fish farming or related businesses. Unfortunately, most of small traders had no certificate from the DoE. Limited numbers of human resources limit the certification and monitoring process. Coordination with other concerned national and local departments seems very important. Third party certification might be very important to the EU retail market.

No well-organized contract growing system was found in fish farming systems. Three cases of product branding (pangas farming, and GEEKY Social) are presented in this report.

Environmental outcome of aquaculture has been associated to the impact of the farmed fish on local wild fisheries and endangered species. Although disease outbreaks can be combated with the use of antibiotics and other chemicals in fish feed, can pose serious threats on the surrounding ecosystems but also on consumers' health. Possibility of farmed fish escapes where in such case competition for food with wild fish can lead to their displacement. Additional environmental concerns, due to use of forage fish to feed farmed fish, were seen associated to water and energy use and to the impact of aquaculture on climate change. Both water and energy remain limited resources in high demand in aquaculture. Some aquaculture operations had been identified having a positive impact on the environment as well as on human health and discussed in the report. Knowledge and awareness of environmental issue were very limited and some issue were not fully realized.

With regard to profitability analysis, monthly average profit from large type fish farming was seen almost BDT. 75,000 (per business per month). Monthly average income of the feed selling business was estimated almost BDT. 100,000. Fish trading includes fish or shrimp depot or *Arat* which gave average profit around BDT. 240,000. Fry trading was the seasonal business; peak in early rainy season. They nearly earned BDT. 30,000 profit from the fry trading.

Feed Industries Association of Bangladesh (FIAB) and BFEEA were seen the biggest associations in the fish industry. In reality, only FIAB and BFEEA have strong capacity to influence government to formation or reformation the policy or act and they might play significant visible role in the industry development and management.

Most of the policies in the industry were not seen to address the needs of small-scale fisheries. Existence of multiple goals in a single policy registered negative effects and makes the policy complicated for management of the resources. Different policies were directly and indirectly linked to fisheries sub-sector development were discussed. Issue related to fish feed; importing new generation additives were also discussed.

It was observed during the study that usually high volume of loan went to the business. Some banks had started to deal with the new fish farming technologies giving quick return. The Banks also provided loan for fish trading and fish feed mills, as the part of fish industry. Still there were some concerns getting loan for fish farming which were discussed. Although the policy of the banks fully supports providing loan to fish farming as a part of agricultural loan. However, some private banks disburse agricultural loan through local micro finance institutes. But many farmers reported about limited access to loan for fish farming. It was seen that getting loan from micro finance institutes was easier.

Finally, major challenges for the sector and future indications are provided in this study report.