Climate Change Adaptation Factsheet: Flood and Drought-Resilient Aquaculture

CAMBODIA CLIMATE CHANGE ALLIANCE

Implemented by Fisheries Administration, with technical support from World Fish Center

Key Highlights

Nylon floating cages to avoid loss of fingerlings during floods

Filtering system to improve water quality, especially in the dry season

Selection of drought-resilient fish species with good survival rates in shallow, warm water

Low-cost technology allowing for replication

Nylon floating cages for fish nursery (photo by FiA© 2012)

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Background

Fishery is an important activity in Cambodia as it provides foods security and support livelihoods of people through generating incomes and it also plays an important role to promote diversification of livelihoods in Cambodia. However, climate change through the increased occurrence of floods and drought and changes in water systems threatens fishery activities.

The project "Building Capacity for Integrating Climate Change Adaptation in Fisheries Sector in Cambodia" was a pilot project funded by the Cambodia Climate Change Alliance (CCCA) and implemented by the Fisheries Administration (FiA) with technical assistance from WorldFish Center. The total budget for the project is USD 400,000 for the period of 21 months starting from 30 October 2011 to 31 July 2013, of which USD 300,000 was funded by CCCA.

The project targeted four provinces: Kratie, Siem Reap, Kampong Thom and Pursat.

The Siem Reap (Puok commune) pilot site presented here focused on technologies for flood and drought resilient fish nurseries.

Adaptation Issue

In the project area, pond water quality is degraded in the dry season, causing lower fingerling survival rates. Moreover, wet season floods allowed the fingerlings and brood fish to spill out of the pond, thereby making the activity unprofitable for fish farmers.

More frequent and severe floods and drought due to Climate Change would make this activity unsustainable without adaptation measures.

Adaptation Measures

In order to test the proposed aquaculture adaptive technology, the project assisted one fish farming family to:

- Build cement filtration tanks that reduce water turbidity and zooplankton of the pond water;
- Build nylon floating cages to nurse fingerlings in a large fish pond that does not dry up during dry season and prevent s fingerlings and brood stock fish from escaping during floods.
- Select adequate species of fish, resilient to warm and shallow water.

Technical support was provided by FiA, the World Fish Center, Siem Reap FiA cantonment and DAD.

Costs

The total cost for the pilot in this site (Siem Reap Province) is about USD 6,000. This cost included 2 trainings (each training cost USD 50), 10 mentoring visits to the family, the construction of a frame structure of nylon floating cages, which are made of plastic PVC tube with the covering of nylon mosquito net (size 3 x 6m each, 3 floating cages). The cost for each cage is USD 150.

The concrete filtration tank which cost USD 1,800 has the function to purify the water quality in the dry season for breeding brood stock fish, hatching fish eggs in fish hatchery, nursing fingerlings in the concrete nursing tank and flowing out to the fish pond.

The useful life of a nylon cage is estimated to be about 3 years and the concrete filtration tank is about 10 years (with the proper maintenance).

The concrete filtration tank is made of a concrete container with charcoal, gravel and sand on its bottom as the filter. A filter net is used to separate these elements (charcoal, gravel and sand).

The meal cost for brood fish in this farm is about USD 500 per year.

Benefits

Before the project started, the fish farmers used nylon nets to block the fish from escaping which is costly and not durable. When the flood came, the net was not effective to stop the fish from escaping. The total annual cost for the period before the CCCA pilot was about USD 750 per year with the return of USD 2,000 per year. So, the annual profit was USD 1,250 per year. The production of fingerlings before using the new technology was about 60,000 – 80,000 fingerlings per year on average including flood years. After the new methodology is applied, the fingerlings product has been increased by 100,000 (up to 160,000 fingerlings per year in total); and the production could be increased even more if there was more demand from the market.

The total annual cost during the pilot is USD 845 with the annual return of USD 4,000 per year. So, the annual profit is USD 3,155. Therefore, the additional benefits, and the assurance that these benefits will not be affected by floods and drought justify increased investment.

Lessons Learned

Three species of fish such as climbing perch (Trey Kranh), hybrid cat fish (Trey Andeng Affric Koun Katt) and Mekong silver barb (Trey Chpen) have been identified as the fish species which resist better in shallow and warm water.

The relatively low cost technology has generated interest locally and shown potential for replication.

One local NGO has already replicated this technique, with support from the pilot farmer. Selection of dedicated pilot farmers is essential (active and willing to provide support for extension)

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