

## ANNEX 9

**Title:** One Pond One Family Policy Brief

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**Abstract:** Policy brief describes possibility of integrating poly-culture model into national strategy for promotion of household aquaculture.

**Keywords:** Poly-culture, production, consumption, aquaculture, Fish on Farms, nutrition, income generation, gender, food security



# Productive ponds

## ‘One pond, one farm’ boosted by mixed species aquaculture

While high in energy, Cambodia’s rice based diet is low in protein and micronutrients, and rates of stunting are among the worst in the region. Recognizing the importance of fish in local diets, the government’s ‘one pond, one farm’ approach aims to improve household food security and nutrition. New research has shown high potential for both food and income generation when small and large fish are raised together in family fishponds. Small fish are eaten whole and provide a rich source of protein and micronutrients. Large fish are consumed or sold for income generation. Incorporating mixed species aquaculture into the ‘one pond, one farm’ approach will dramatically improve its impact.

### What are the issues?

Cambodia has made remarkable improvements in food security over the past decade. However, food insecurity at the household level remains high. Stunting is among the highest in the region at 40%. Among women of reproductive age, chronic malnutrition and anemia are high, at 20% and 40% respectively. This is because the Cambodian diet, which consists mainly of rice, provides sufficient energy but lacks protein and micronutrients.

Fish accounts for over 80% of Cambodians’ meager protein intake and is a key source of micronutrients. However, capture fisheries are declining due to overfishing and global warming. In addition, the

### Did you know?

- Small and large fish can be raised together in family fishponds.
- Small fish can be eaten whole and are an excellent source of protein and micronutrients such as vitamin A and iron.
- Large fish can be consumed by the family or sold to generate income to buy high quality food.
- Management of fishponds has been shown to improve women’s confidence in making spending decisions by over 70%.

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## Empowering women

Fishponds, unlike other types of agriculture, are often managed by women, who in turn, control the money generated. The 'Fish on Farms' project has demonstrated the need to empower women through extensive technical training and knowledge transfer. This is a crucial aspect of the project, because greater autonomy for women has been linked to improvements in maternal and child health, nutrition, and food security.

In participatory research led by Helen Keller International, in partnership with the University of British Columbia, Canada and other organizations, including the government Fisheries Administration (FiA) and a local NGO (Organization to Develop Our Villages), Cambodian women report improved confidence in making spending decisions, following their adoption of mixed species pond aquaculture. Income earned from the sale of fish is spent on food, children's education, and agricultural inputs such as seeds and fish feed. In addition, the project also has gender-training sessions for men. Although the bulk of housework is still done by women, as a result of the project women report that their husbands share more work around the house than before.

planned damming of the Mekong River will have negative effects on the Tonle Sap, the largest freshwater lake in Southeast Asia. The Tonle Sap is the lifeblood of Cambodian agriculture, not only as a source of fish, but water, which sustains rural agriculture including paddy rice.

### **'One pond, one farm'**

Responding to this, the Cambodian government has recognized the importance of pond aquaculture, with the Prime Minister calling for a fishpond for every poor family. Sixty-five percent of rural homes now have some form of family pond. However, recent research suggests

that the productivity of these ponds could be significantly increased through some relatively simple strategies.

Chief among these is mixed species aquaculture. Small, indigenous fish can be raised with large fish in the same pond. These small, micronutrient-dense species can be frequently harvested and used for household consumption, providing a direct source of vitamins and minerals. Large fish can be consumed and/or sold to generate income, funding other important household resources, including protein-rich foods. An independent



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Households who practise fish farming can earn significantly more income

environmental impact assessment has found that the fishponds cause no environmental harm and may offer benefits, such as preventing soil erosion. Those building ponds need to be aware, however, of the need to allow a safe distance between the pond and the household well, in order to prevent contamination of drinking water supplies.

## What are the policy implications?

Mixed species pond-based aquaculture for rural households is consistent with the ‘one pond, one farm’ approach, providing a ready source of household nutrition from small fish and income from larger ones. There are, however, some hurdles which must be overcome before mixed-pond aquaculture can be scaled up in Cambodia. Currently, while small-pond aquaculture features in agriculture extension programs it is not well established, and does not include mixed-pond aquaculture. Under the ‘Fish on Farms’ research project, Hellen Keller International is helping to train extension workers in the practice, but more NGOs need to be encouraged to become involved, and to coordinate their efforts. Encouragingly, the Fisheries Administration has already started expanding its work with NGOs to engage them on aquaculture, and to develop and re-excavate old ponds for fish production.

In addition, while the project has demonstrated that involvement in pond aquaculture improves women’s confidence and autonomy, greater women’s empowerment is possible. Supporting the creation of community aquaculture



Small pond aquaculture is not well established in extension programs

organizations for women would enable them to share technical knowledge, benefit from efficiencies of scale, and attain better prices for their fish through group marketing.

Scale up of aquaculture can best be achieved, therefore, by the following strategies.

- Incorporate mixed species aquaculture into

Key nutrients in fish per 100/g	Protein (g)	Fat (g)	Iron (mg)	Zinc (mg)
<b>Large fish</b>				
Silver barb ( <i>Barbonymus gonionotus</i> )	13	10	4	1
Rohu ( <i>Labeo Rohita</i> )	14	5	7	4
Mrigal ( <i>Cirrhinus mrigala</i> )	14	5	2	3
Carp ( <i>Hypophthalmichthys molitrix</i> )	13	7	5	2
<b>Small fish</b>				
Flying barb ( <i>Esomus longimanus</i> )	15	3.5	3	3
Croaking gourami ( <i>Trichopsis vittata</i> )	14	3.5	3	3
Minnow ( <i>Amblypharnygodon</i> )	14	4.5	14	3

Figure 1. Key nutrients in fish by species



the 'one pond, one farm' approach.

- Integrate aquaculture into existing agricultural extension programs.
- Organise women involved in aquaculture at the community level.
- Integrate mixed species aquaculture within non-governmental development programs on food security and nutrition.
- Establish hatcheries at the local/village level in order to provide farmers with a source of fish fingerlings.

## Dike cropping

Producing and harvesting fish from rice fields during the rainy season is a traditional practice among rural Cambodians. However, this is very seasonal and does not ensure availability of fish throughout the year. Through the 'Fish on Farms' research project, 330 households in rural Prey Veng province adopted fishponds stocked with small and large fish. To make the pond more productive, dike cropping was used to prevent soil erosion and evaporation. By growing crops on dikes, farmers can increase both fish and vegetable production. In one year, small fish production increased from 0 to over 3 kg per month and large fish production from 1 to 10 kg per month.



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The Fisheries Administration has already begun restoring some ponds for production

## References

- IDRC. *Nutrition From Aquaculture and Home Gardens in Cambodia*. <http://bit.ly/1gHd3Ni>.
- IFAD. 2010. *Rural Poverty in Cambodia*. <http://bit.ly/RKLbSy>.
- Oxford Poverty and Human Development. 2013. *Country Briefing: Cambodia*. <http://bit.ly/1jzhwSr>.

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