Annex 8d

Title: Fish on Farms Nutrition Bulletin #4

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Abstract: Nutrition bulletin describing the monitoring of process and results of the Fish on Farms Project

Keywords: Bulletin, HFP, monitoring, production, consumption, aquaculture, Fish on Farms, nutrition, income generation, gender, food security
Fish on Farms
Integration of Small Scale Aquaculture with Homestead Food Production for Improved Food and Nutrition in Rural Cambodia

Monitoring of Homestead Food Production with Small Scale Aquaculture Activities at Village Model Farm and Household Levels

In rural Cambodia high quality micronutrient rich food is often outside the economic reach of households; however the Fish on Farms project is working to change that. According to data from Rounds 1, 2 and 3 of monitoring activities at the Village Model Farms and household farms, the project is improving household food security, nutrition outcomes and livelihoods in the target area. Through the homestead food production (HFP) plus aquaculture model, participants are able to increase production of fruits, vegetables, and fish thereby diversifying their diets. In Round 3 the amount of small and large fish harvested at the household level continued to increase and households reported healthy consumption patterns. In addition, the income generated by the households through the sale of vegetables, fruit, and fish increased in Round 3.

Fish on Farms Project Overview
By incorporating household polyculture fishponds into an existing model of plant based agriculture, the Fish on Farms project builds upon the well-established HFP program. Through a cluster randomized control trial occurring in four districts in Prey Veng province, we aim to test the effectiveness of an integrated HFP plus aquaculture model. The trial consists of three arms: HFP; HFP + aquaculture; and a comparison group. There are ~300 households across 30 villages participating in each arm of the project. In each participating village there is a Village Model Farm (VMF) and ten household farms. The VMF is the site for training and demonstrations of aquaculture and farming techniques, as well as technical support. The polyculture fishponds are stocked with a combination of 3 large fish species and 3 small, micronutrient-rich fish species to provide fish for food, nutritional benefit and income. The participating households also attend training sessions on gender, nutrition, group marketing and infant and young child feeding practices. Through this comprehensive approach, the Fish on Farms project seeks to improve household food security and nutrition outcomes, livelihoods, and women’s...
empowerment. Here we describe findings on the outcomes of the project implemented during four, eight and twelve months of the 24 month project using data collected as part of routine project monitoring. This bulletin reports findings from the HFP + aquaculture arm only between four months (Round 1), eight months (Round 2) and twelve months (Round 3).

Program Description and Implementation:
By the end of Round 3 in September, 2013, the Fish on Farms project had achieved many milestones: a comprehensive needs assessment and a baseline survey have been analyzed; the training and promotional materials for the program have been finalized and distributed; the fish nurseries, brooder ponds and household fish ponds are established; all of the farms necessary for the agricultural arm of the project have been established; and various trainings sessions for the household farmers, VMF farmers and training staff have occurred. During Round 3, which occurred from June through September, the participant households continued to receive training and technical assistance for their home gardens and household fish ponds. During the months of July-September the fish ponds were restocked with fingerlings to maintain the fish populations. 40% of the new fingerling fish stock was produced in the project hatchery.

Methodology:
HKI’s monitoring system collects data from VMFs and households every four months. Round 1 occurred from October 2012 to January 2013, Round 2 from February 2013 to May 2013 and Round 3 from June 2013 to September 2013. Three Agricultural Extension Workers from the Provincial offices of Agriculture assisted with routine project monitoring. They received training prior to each round of data collection. The HKI Monitoring Team is responsible for quality control at the VMF and household level. The following sampling procedure was followed:

Village Model Farms: All 60 VMFs (30 in HFP + Aquaculture arm and 30 in HFP arm) were included in Round 1, 2 and 3 of routine project monitoring.

Households: 5 households under each VMF were randomly selected for interviews in Round 1, 2 and 3. In addition, 5 households in each village of comparison group were also included in the interview (n=450).

Questionnaires: Two different questionnaires were used for monitoring: (1) VMF’s monitoring form for collection of information about the VMF and (2) household’s monitoring form for collection of information on the household’s garden. The VMF monitoring form includes information about: the area; number of varieties of seed, seedlings and saplings present in the VMF; quantity of seed/seedlings/saplings produced and sold; income generated; and production of large and small fish. The household monitoring form collects information on: type of garden; number of varieties present; quantities of vegetables, fruit and fish produced and sold; source of seed; main caretaker; gender roles; and consumption of fish, fruits and vegetables.

Results:
VMF production
VMFs are an important component of the Fish on Farms project not only because they serve as the site for community demonstrations, practical trainings and technical assistance, but also because they are the source of agricultural and aquacultural inputs for the households in their village. As shown in Figure 1, the median number of variety of vegetables produced at the VMFs has decreased slightly since Round 1, while the median number of variety of fruits produced has consistently increased.

The VMF is also responsible for the production of small and large fish species. As shown in Figure 2, there was an increase in the amount of fish harvested between Rounds 1 and 2 followed by a sharp decrease in Round 3. This occurred because the fish ponds were restocked during Round 3 and so fish harvesting was temporarily stopped. It is expected that the fish harvest will increase once again in the next round.

Household production
At the household level, both the homestead gardens and fish ponds continued to be productive. As shown in Figure 3, the quantity of vegetables produced by participating households has increased since Round 1,
and the quantity of fruits produced has also increased between round 2 and round 3.

![Figure 3: Household production of vegetables and fruit in the last two months](image)

Despite the increase in the amount of vegetables and fruits produced in Round 3, the median number of varieties of vegetables and fruits produced decreased from 7 to 5 and 3 to 2 between Rounds 1 and 3, respectively.

![Figure 4: Varieties of fruits and vegetables currently growing in household gardens](image)

Additionally, as shown in Figure 5, the amount of small and large fish harvested in the last two months has continued to increase. During Round 1 the median amount of small and large fish harvested was 1.5kg, and by Round 3 that amount rose to 10kg.

![Figure 5: Amount of small and large fish harvested from the household fish ponds in the last two months.](image)

**Household consumption**

Fish on Farms seeks not only to increase production, but also to improve consumption patterns. As shown in Figure 6, in Round 3, 100% of the participant households reported consuming vegetables in the last 3 days.

![Figure 6: Percentage of households that consumed vegetables in the last 3 days](image)

Additionally, throughout Rounds 1, 2 and 3 most participating households reported that they had consumed fresh fish in the previous 3 days.

![Figure 7: Percentage of households that consumed fresh fish in the last 3 days](image)

**Income Generation**

The Fish on Farms activities not only provide families with food for consumption, but also a source of income generation. As indicated by Figure 8, the median total income generated by participating households through the sale of fruits and vegetables has increased throughout the project. In Round 1, households generated a median of 20,000 riel; by Round 3 that number had doubled to 40,000 riel.

![Figure 8: Total income from selling vegetables and fruits in the last two months (riel)](image)
Challenges:

- During Round 3 the ponds were restocked with fingerlings and so fish harvesting was temporarily stopped.
- There was extreme flooding throughout much of Prey Veng province during the round 3 period, causing the home gardens of some participants to flood, destroying some crops.
- During the dry season (February-May) it was difficult to maintain the water level in some of the fish ponds, and some ponds dried up. Some of these ponds remained inactive during Round 3.
- Staff members from both HKI and the local NGO partner, ODOV and World Fish, left the program during the study period.

Conclusion and Recommendations:

The results from Rounds 1, 2 and 3 of monitoring data show that the Fish on Farms project has continued to make progress, especially at the household level.

The amount of vegetables produced at the household level has improved throughout the project, but the variety of vegetables has decreased [Figures 3 and 4]. There are some improvement on women empower. Women alone can decide how to use their own money without asking husbands has been increased from 53% in round 1, 68% in round 2 and 75% in round 3. As the diversification of diets is a crucial goal of the Fish on Farms project, production of a variety of fruits and vegetables is very important. In future rounds, special attention should be paid to increasing the variety of both fruits and vegetables produced in the home gardens while also increasing the amount of fruits and vegetables that is produced. This will ensure that participating households not only have access to sufficient fruits and vegetables, but that they have access to a nutritious variety as well.

Income generation from the sale of fruits and vegetables has consistently improved [Figure 8]. The results from Round 3 show that the median income generated has doubled since Round 1. This is very promising because the results of HKI’s other HFP programs have shown that increased income generation leads to increased food security and improved livelihoods. Because of this, income generation should remain a focus of the program. Special attention should be paid to generating income through the sale of fish.

At the VMF level, special attention must be paid to increasing the variety of vegetables produced. The number of varieties of vegetables has decreased since Round 1 [Figure 1]. Because the VMF is a source of vegetables and agricultural inputs for the village, it is crucial that they produce a large variety of fruits and vegetables.

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