

Women in small-scale aquaculture development in Cambodia

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- * A survey conducted among 215 families involved in fish culture in Prey Veng and Svey Rieng Provinces indicates that women contribute significantly to most of the activities in fish culture.
- * In pre-stocking operations like pond digging and preparation of pond and seed procurement, men contributed the maximum labour; while in post-stocking operations like fertilization and feeding, women were the important workers.
- * Daily harvest and final harvest were generally a joint effort.
- * Participation of women was higher in Svey Rieng Province than in Prey Veng.
- * Literacy, average family income and natural fish availability were higher in Prey Veng.
- * Fish culture was viewed more as a commercial activity in Prey Veng. Svey Rieng it was considered as the family food source.
- * There was no conspicuous change in the status of women in the family with the introduction of fish culture, but most women felt that aquaculture contributed an important food source for the family.
- * Feed and seed were bottlenecks for undertaking most operations independently by women.
- * Improvements to fish culture techniques and increased information availability were recognized as the immediate need of women involved in fish culture.

Cambodia enjoyed the privilege of having a good amount of fish availability from capture fisheries, which was estimated at more than 25 kg/person/year, prior to the 70s. However, owing to various causes production from capture fisheries has been showing a decline, resulting in reduced availability of fish. At present it is estimated at less than 13 kg/person/year. In view of the food habits of the people and considering the nutritional requirement of the families, it has been suggested that Cambodians require a minimum of 32 kg of fish/person/year while the optimum level is about 48 kg. In order to overcome this huge gap between requirement and supply, aquaculture is recommended as an alternative. On an average, most Cambodian families consist of 6 members and each family owns about 1.5 ha. As there are more opportunities to undertake aquaculture on a small scale using various on-farm resources, small scale aquaculture is recognized as an appropriate system to meet the requirement of the population. Cambodia has no long tradition of farming fish in ponds, though cage culture is recognized as a system that originated in this country a century ago.

Small-scale aquaculture development

PADEK initiated the process of development and promotion of aquaculture technology in 1991-92 as part of its community development programme. Exotic tilapia was used in the project areas located in Prey Veng and Svey Rieng provinces in the southeastern part of the country. Though initial attempts with this species were not successful, farmers indicated their interest in this new occupation. PADEK pursued the programme by establishing a fisheries center to provide the scientific support for the development activities. The Bati Fish Seed Production and Research Centre which is supported by PADEK and located in Prey Veng province, has been able to develop and demonstrate small scale aquaculture technologies appropriate for the region in the last three years. Over 800 farmers have now undertaken aquaculture in PADEK-supported project areas spread in four provinces (Prey Veng, Svey Rieng, Kompong Speu and Siem Riep).

Photo competition on Women in Asian fisheries

The Asian Fisheries Society (AFS) in association with PADEK (Partnership for Development in Kampuchea) will organize the second international photo competition on "Women in Asian fisheries" to coincide with the fifth Asian Fisheries Forum in 1998.

The competition will highlight the crucial role of women in the socio-economic fabric of Asian fisheries. Entries will be judged by a panel appointed by the sponsoring organizations. Emphasis will be placed on relevance to the central theme, photographic quality and aesthetic content. Three prizes will be awarded: first prize US\$500, second prize US\$300 and third prize US\$200. Contest rules are:

1. The contest is open to all, except officials of AFS and PADEK. Entry is free.

2. Any number of entries may be submitted. Photographs should be of 8R size (8x10 inches) with a one-inch border all around. Each entry must have a caption of not more than 15 words describing the picture.

3. Entries must be posted in an envelope marked "do not bend" and should reach the AFS Secretariat in Manila by 30 September 1998. Proof of posting will be acknowledged as proof of receipt.

4. Each winner is entitled to one prize only.

5. All entries become the property of AFS and PADEK, and will be used, with due acknowledgment, for the better cause of science.

6. Entries will be displayed during the Fifth Asian Fisheries Forum to be held in Chiangmai, Thailand, on 11-14 November 1998. Prizes will be awarded during the Forum. Winners unable to attend will receive their prizes by mail.

7. Entries and further inquiries should be addressed to: The Secretariat, Asian Fisheries Society, MC PO Box 2631, Makati City 0718, Philippines.

This article is based on a survey which summarizes the involvement of women in small-scale aquaculture in Prey Veng and Svey Rieng where the activity has been practiced for three years. The survey defines the role of women in small scale aquaculture and identifies constraints to and opportunities for the participation of women in small scale aquaculture. It also examines the access to and control of resources in regard to fish culture at the family level, and verify the position of women in regard to these issues owing to the introduction of new activity.

Use has been made of available data at PADEK and additional information obtained through field interviews. In previous data-gathering exercises after each culture cycle, information on the production and the processes involved in production was given by the husband. However, in this instance, the wife was requested to provide the answers. Respondents were those who had raised at least one crop and were active participants in the activity. The study covered 108 fisher families in Svey Rieng and 107 in Prey Veng.

The provinces

Both Prey Veng and Svey Rieng are located in the south-eastern part of the country but there are many differences between the two. The former has many wetland areas and a long stretch of the Mekong River, while Svey Rieng does not have large rivers and wetlands. Fish production from capture fish-

eries reaches 3,000 tonnes in Prey Veng; it is not significant in Svey Rieng where capture fisheries comes from fishing in rice fields.

Prey Veng is larger in area with a population of 950,000, more than double that of Svey Rieng's 431,000. The 107 fishing families selected in Prey Veng were spread out in the districts of the province (Prey Veng and Presdaic) while the 108 families in Svey Rieng were all clustered in the Romeas Hek district.

Findings

Culture systems

Most farmers used 4 to 5 species of fish depending on the availability of seed. The species cultured included silver barb (*Puntius gonionotus*) and silver-striped catfish (*Pangasius hypophthalmus*), silver carp (*Hypophthalmichthys molitrix*), big-head carp (*Artisticthys nobilis*), common carp (*Cyprinus carpio*) and Nile tilapia (*Oreochromis niloticus*). These species were stocked in various combinations and generally at a stocking density of 3 fish/m². Ponds varied in size from 100 m² to 400 m², but most ponds were less than 200 m². A wide variety of resources (more than 25 types) available in the farm was used in small-scale aquaculture activities carried out in the two provinces. Fish were cultured for 6 to 8 months based on water retention in the pond. Only in a few cases was the culture period extended beyond 8 months. Maximum water depth of most ponds was about 3 meters, reduced to less than 0.5 meter in the summer. Prey Veng soils are clay; Svey Rieng sandy loam.

Family structure

Most of the families surveyed were headed by a male member. Few families were headed by widows. In fact, in the survey areas the percentage of widows was small, and does not correspond to the reported figures for the country. In both provinces, average family size was 6 people. Average age of the husband was 40 and that of the wife, 38. On an average, each family had 4 children, the youngest averaging 6 years in age. In most cases, families had two male and two female children. Those families which had already had four children did not desire any more; those with less than four wanted more. Literacy levels of husband and wife was higher in Prey Veng than in Svey Rieng.

Land and crop areas

In Svey Rieng, the average landholding was about 1.3 ha, and in Prey Veng, 2.30 ha. Paddy was the most common crop cultivated in both provinces, with average yield at 1.2 tonnes in Svey Rieng and 1 tonne in Prey Veng. This difference in production was due to the drought which hit Prey Veng in 1994 and 1995. Apart from paddy cultivation which was a major source of occupation, secondary crops included sugar palm and vegetables. Other forms of livelihood are basket weaving and pig-rearing.

Income

The average annual family income was higher in Prey Veng (US\$414) as compared to Svey Rieng (US\$370). The income included only the produce sold and salary income, if any; it did not consider the food items consumed by the family and daily wage earnings.

Fish culture responsibilities

Fish culture was undertaken by the families in the existing ponds which were constructed under various programmes in the past. The ponds in Prey Veng were bigger in size than those in Svey Rieng. Men were responsible in majority of the families. However, in several families women were responsible for the day-to-day management of ponds.

In Prey Veng, most respondents indicated that all members of the family had some responsibility for fish culture management; but in Svey Rieng, men were more responsible for overall pond management. However, further analysis in terms of individual activities in fish culture indicated that women were responsible for many of the activities in Svey Rieng. Men did most of the heavy work such as pond digging, application of lime and fertilizer, and procurement of seed. However, after seed has been stocked, women generally took over most of the activities such as fertilization and feeding.

Men had the higher percentage of labor input in terms of daily and final harvest of fish; but women were equal participants in these activities.

Fish vending was the domain of women. When the women were asked whether fish culture could still be done in the absence of their men, the answer in Svey Rieng was, yes, they could still carry on. But in Prey Veng, the majority of the women were not confident they could do it.

Participation in training

A significant number of women did not attend any training course organized by the staff in the communes in both the provinces. The reason was not low literacy; it was more because household responsibilities prevented them from attending training courses. However, the Svey Rieng women had a higher level of participation than those in Prey Veng. This could explain why the wives in Svey Rieng were confident of their abilities to carry out fish culture without the support of the men. But in both provinces, women desired the support of men in searching for feed, procurement of seed and harvest of fish.

Information format

The women were asked on the mode of information they preferred. Svey Rieng women preferred the radio, while those in Prey Veng, videos. This has a direct relationship with the percentage of families owning television and radio sets in both provinces. Also, less than 40% of the families preferred manuals or bulletins, an indication of the level of literacy in the sample provinces.

Fish yield

The average production obtained was about 25 kg/100m² in 8 months in Prey Veng; and 39 kg/100m² for 8 months in Svey Rieng. Most women were happy with the fish production in Svey Rieng; but those in Prey Veng expressed dissatisfaction with the results. This attitude was because fish culture is an income-generating activity in Prey Veng, but mainly a source of family food in Svey Rieng. Some 75% of the produce in this province was consumed at home, while 40% of Prey Veng's was sold in the market.

Prey Veng had a lot more natural fish than Svey Rieng and it is possible that the variations in the natural fish availability also influenced the level of participation of women in the aquaculture activity in both provinces. Additional observations on the question of who initiated the fish culture activity indicated that women were responsible in a larger percentage of the

families in Svey Rieng; in Prey Veng, the men in the family were the decision makers in this regard.

Financial management

In most families, the women were the financial managers. But the husband made the final decision in consultation with the wife. It should be noted that fish culture is still largely a family food source rather than as an income generator for the family.

Benefits of small scale aquaculture

The results identified the following benefits of the aquaculture system in the area.

- Increased fish availability, therefore contributing to food security;
- Improved financial situation as a result of additional income from fish sales;
- Improved social status owing to the success of the enterprise;
- Improved relationship with friends since fish could be given as gift from the harvested fish in the pond;
- Better use of resources and improved nutrition of the families due to increased fish consumption.

In addition, women did not consider fish culture a burden, but rather as an activity to provide more food source for the family. Other benefits included the recreation afforded by the daily feeding and observation of the feeding behaviour of fish. But more than all of the above benefits, the area around the fishponds remained comparatively greener even during summer, with better water retention in the fishponds.

Conclusions

Women are an important work force in fish culture in Cambodia. Majority of the activities can be carried out by women, although those activities which require long travel such as searching for feed were largely carried out by men were required. The final harvest also could be done more easily by men. To increase women's confidence and involvement in fish culture, it may be well to develop techniques to reduce the level of fish search, or even avoid the need to search for feed and green manure. It would also be well to develop alternative techniques of fish harvest.

It is likewise essential to increase the participation of women in training and explore ways to enhance their knowledge through various ways, keeping in mind their level of literacy. Extension mechanisms to deliver messages at the women's doorstep using audio or video means, as well as easily understood printed materials should be designed.

Seed has to be obtained from distant places. Establishment of village-level hatcheries and nurseries would help women to carry on the fish culture activities by themselves. Credit availability and interest rates remain as major issues to be addressed. Provision of credit on easy terms would help increase fish culture activities.

Though access of women to fish grown in the pond was limited due to constraints in harvesting of fish, men were always found to be cooperative to meet the needs of their womenfolk. In all cases in both provinces, access to resources was not identified as a constraint. Decision-making was in most cases made jointly.