# Effectiveness of mobile and permanent hatchery practised by community fisheries

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Management of River and Reservoir Fisheries in the Mekong Basin, Cambodia Sub-Component, and Aquaculture of Indigenous Mekong Fish Species Sub-Component

## ABSTRACT

Mobile hatchery was introduced in 2004 in order to response the needs and implement CF action plan in 2004 for CF federation in Tmorda/Teukchhar Reservoir. Based on the experiences of mobile hatchery activities, the requested permanent hatchery activities were made by other CFs in other MRRF target areas in coming year CF plan.

Concerning with several aspects related to the types of small-scale hatcheries through consultation made among CF committee members and technical person, small-scale permanent hatcheries were introduced for two CFs in Kandal Province to implement CF action 2005. Therefore, it is important to write up the effectiveness of both types of hatcheries in terms of social and economic perspectives, so that recommendations and lessons learned could be made for the better practices and support CF activities for development and management.

Based on the results of practical work by CF committee members through both types of hatchery show that mobile hatchery is suitable and useful for CFs. It could be moved and scheduled with other CFs as required. However, the maintenance cost of this mobile hatchery is more than the permanent hatchery, and it is suitable for breeding with some species only. While permanent hatchery is located in one area only, with suitable location of hatching and nursing activities, and also fish breeding, the mobile is suitable for more species than permanent hatchery.

## INTRODUCTION

Alternative livelihoods was one of the important activities prioritised by Community Fishery (CF) members during CF review and CF planning for 2004, in providing job opportunities to rural poor people. Fish stocking in reservoirs, CF fish ponds and family fish pond culture were identified as the alternative livelihoods for CF members in the target areas. Therefore mobile hatcheries, as well as permanent hatcheries, are priority activities and have been proposed in the CF action plan for 2004 (Tmorda/ Teukchhar and Chroy Check Reservoir). This is in order to produce available fingerlings in the local areas for the purpose of having and increasing fish catch from the reservoirs, common/ CF ponds and family ponds for household consumption and additional income.

The main purpose of both hatchery types (permanent and mobile) is to produce fingerlings for stock enhancement in the reservoirs, and for rural aquaculture for CF members. Mobile hatcheries could be used not only at one CF or place; they can be used for other CFs to use as well in a hatching season.

Therefore, it is important to study the effectiveness of those both types of hatcheries practised by Community Fisheries.

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## WHY MOBILE AND PERMANENT HATCHERIES

Mobile and permanent hatcheries were given a high priority in the action plans of Community Fisheries. Because CF committees and members thought that it is the way to increase fish stock in the reservoir and develop fish farming in CF to improve livelihoods of local people. They also think mobile and permanent hatchery are a means to provide additional income or budget for CF management and individual CF members.

The specific objectives of having mobile and permanent hatchery are as follows:

- to implement the CF action plan;
- to provide local fingerlings for fish stocking/restocking in the reservoirs, CF/common ponds, and family ponds;
- to provide/increase fish catch from the reservoirs and ponds for household consumption;
- to provide additional income or budget for CF management and individual CF members;
- to increase higher participation of CF members and actively in implementing CF management plan;
- to empower CF committee members through capacity building on livelihood coping strategy;
- to strengthen CF management in a sustainable way;
- to increase the alterative livelihood activities such small-scale aquaculture (fish pond culture) activity for CF members in the rural poor areas.

## WHO BUILDS, OWNS AND USES?

Mobile and permanent hatchery are operated and used by Community Fisheries with technical support from staff of MRRF and AIMS Cambodia sub-component.

## CONSTRUCTION OF HATCHERIES

The mobile hatchery was built by community fisheries committees with technical support from AIMS Cambodia sub- component and funded by MRRF.

### *Mobile hatchery*

At each reservoir, the following equipment was used:

- 700 litre header tank (Figure 2)
- 1 induced spawning tank (made from iron pipe and plastic tent material)
- 1 hatching tank (made from iron pipe and plastic tent material)

- 1 hatching system (made from 2 litre plastic water tanks)
- Inlet and outlet system
- Aeration system
- 1 generator and
- 1 water pump

Figure 1. Spawning tank and 700 liter header tank (left) and spawning tank (right)

*Permanent hatchery*

The permanent hatchery was built by community fisheries committees with technical support from AIMS Cambodia sub- component and funded by MRRF. It was equipped with:

- header tank
- 1 induced spawning tank
- 1 hatching tank
- Inlet and outlet system
- Aeration system
- Water pump

Figure 2. Spawning tank and hatching tank (left) and header tank (right)

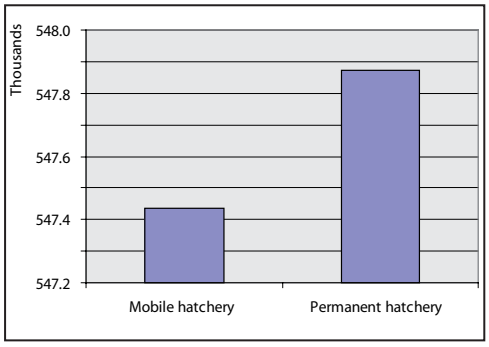
*Experimental process*

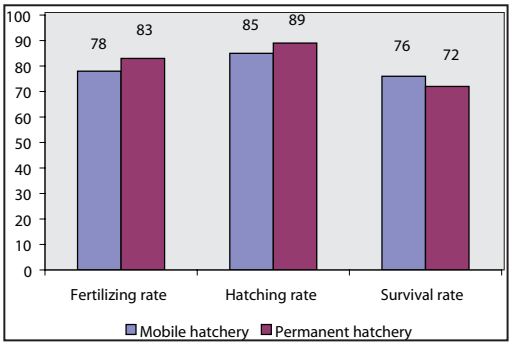
The test was made with *Barbonymus gonionotus* for both types of hatcheries. The broodstock were collected and selected from the Government Station and from the wild. Five breeding batches were obtained with each type of hatchery.

To evaluate the effectiveness of the hatcheries, the egg releasing time, hatching time, fecundity, fertilizing rate, hatching rate and survival rate were recorded and analyzed using SPSS software using ANOVA statistical analysis.

## RESULTS

Figure 3 shows the mean of fecundity of a one-kilogram fish (547,400 eggs/kg) from the mobile hatcheries while for a one-kilogram fish from the permanent hatchery the fecundity was 547,800 eggs/kg from the permanent hatchery. Based on the data analysis the fecundity mean was not found to be significantly different between the permanent and mobile hatchery.




Figures 3 and 4. Result of Fecundity during the breeding of *B. gonionotus* (left) and result of F. rate, H. rate and S. rate during the breeding of *B. gonionotus* (right)

Based on data analysis, the mean of fertilization rate, hatching rate and survival rate from both types were not significantly different. The mean ranged from 78 to 83 per cent of fertilizing rate, 85 to 89 per cent of hatching rate and 72 to76 per cent of survival rate (Figure 4).

The economic efficiency was also analyzed to evaluate the effectiveness of both hatcheries. Based the analysis the operation cost of one seed produced was significantly higher in the mobile hatchery than in permanent hatchery. The higher expense in the mobile hatchery was due to high cost of maintenance. Table 1 shows the operation cost per unit seed and main expense for both types.

Table 1. *Operational costs*

| Type of Hatcheries | Mobile hatchery | Permanent hatchery |
|---|---|---|
| Operation cost per unit fry | 0.42 Riels | 0.31 Riels |
| Main expense | Depreciation | Fuel |

ADVANTAGES AND DISADVANTAGES OF MOBILE AND PERMANENT HATCHERIES

| Mobile Hatchery | Permanent Hatchery |
|---|---|
| **Advantages** | |
| ✓ Can be moved<br>✓ No specific site to place<br>✓ Avoid genetic problem as it uses broodstock collected from the site<br>✓ Good effective for scale fish | ✓ Long life use<br>✓ Good effect for many species including catfish<br>✓ Easy to manage |
| **Both Types** | |
| ✓ Increase income and food for people in community<br>✓ Encourage committees to strongly participate in community development | |
| **Disadvantages** | |
| ✓ High cost of depreciation<br>✓ Can effect only few fish species<br>✓ Difficult to manage (hatchery equipments) | ✓ Higher cost for operation<br>✓ Need specific site to install<br>✓ Lower survival rate when improper hatching tank preparation |

CONCLUSIONS AND RECOMMENDATIONS

- Mobile and Permanent Hatchery provide the same effects in breeding of indigenous fish to enhance fish stock and develop aquaculture.
- Mobile and Permanent Hatchery play a very important role to provide income and food for community fisheries committees and local community members.
- Mobile and Permanent Hatchery provide the financial support and encourage to higher participation of CF members and to sustain the Community Fisheries in managing natural resources.
- However, mobile could be used for more than one CF and more than one stock enhancement in the reservoirs and it is useful for where no available location.