

User Manual LIFE Model

additional item 3

Manual for the dissemination of fish farming with the model LIFE

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Introduction

The development project of the integrated approach to environmental restoration and rural development Morarano Chrome (hereinafter "PRODAIRE") started in February 2012 with the objective of establishing a model for large-scale (hereinafter "LIFE model") to promote integrated manner rural development and soil conservation in upstream areas degraded Madagascar. To develop the LIFE model, PRODAIRE has implemented various activities such as reforestation, production of improved stoves (kamado) stabilizing lavaka etc ... in the Alaotra Mangoro region for about 5 years. This extension manual of **fish farming using the model LIFE (hereinafter "Manual") is intended to popularize fish farming (including seed production)⁴⁶ among the rural development activities promoted under the project. What is the basic concept of the LIFE model? What are the possibilities to popularize fish farming with the LIFE model? What are the findings in the practice of fish farming? What kinds of techniques to be adopted? And what are the risks and benefits? The Manual tries to answer all these questions, based on our practice and our experiences in Alaotra Mangoro region. We are pleased that the Manual helps you to find a solution to any problems when you adopt the LIFE model to popularize fish farming.**

1. Extension possibility of fish farming with the LIFE model

1) Structure extension in the LIFE model

The extension system in the LIFE model is a system for providing services such as training and monitoring in all target people, so to speak, it is a tool to exchange information between your project and the local population. This structure is composed of zone managers and local trainer. Area Managers role is to support and manage the training and monitoring performed by local trainers. As for the local trainers who are chosen from the local population system, their function is the implementation of training and monitoring activities of the local population (see the User Manual 2-1 Structure extension).

The LIFE model provides concrete measures to meet the needs of people through training through the extension structure. As PRODAIRE aims to establish the model to promote soil conservation and rural development in areas degraded upstream, people feeling the need wants to plant trees on their land sloping accordingly. Local people who will receive training on simple techniques to plant trees with simple materials available in the area, will automatically start their activities to meet their needs with concrete measures that have been given to them through this training (see the user manual, 1-3 mechanism for generating the total).

2) Popularize fish farming with the LIFE model

Now let's look at the case of extension of fish farming. Fish farming is one of the income generating activities, and extension of aquaculture is rural development by enhancing fish farming as an IGA.

In general, when a project is implemented with the main objective to popularize fish farming with the local population, the project staff invites administrative authorities such as governors, mayors, village leaders, and take meetings with the local population, in which peasant leaders are selected as targets for the technical transfer. In such case, these models were selected farmers from their relationship with local authorities, administrative or traditional, rather than in relation to the assessment of their capabilities, motivation and / or development needs. Accordingly, since the selection of model farmers was not made on the basis of their motivation or their need for development,

However, when the extension of the fish is done as one of the measures for the promotion of rural development in the LIFE model, information about the farmers who have the real need

⁴⁶ In the manual, training on fish farming means training on the expertise for rearing fingerlings, while fry production means broodstock reproduction techniques for the fry.

development are collected through the area managers and local trainers. These farmers already have a strong motivation for fish farming, and are already facing difficulties in the conduct of their activities, with or without the support of the project. It is often this type of fish farmers who happen to succeed in overcoming obstacles after receiving training and advice in the LIFE model.

In other words, it is possible to establish an extension structure in the LIFE model to promote soil conservation measures such as reforestation because the majority population feels a strong need in headwater areas degraded in Madagascar . Then, once established this framework, it enables the effective extension of the fish selecting fish farmers who have the real need for development among the target population.

2. Training on fish farming and followed

1) Basic concept of the LIFE model

The LIFE model is based on the approach PRRIE ("Participatory Rural Development and Resource Management by Integrated Training for Equal Opportunity"). The central and essential in PRRIE is to give equal opportunity to the entire target population. The trainings conducted in the LIFE model are data within five principles (see the User Manual, 1-1 approach and features of the model).

5 principles of training according PRRIE

(1) held locally, home to the populations concerned, (2) using local material and human resources, (3) respond to local needs, (4) open to all,

(5) addressing the largest possible majority.

2) Equal opportunity in the formation of the fish

It is necessary to implement the five principles mentioned for the popularization of fish farming with the LIFE model. There are actually not many people who have a need for support to solve the problems encountered in the practice of fish farming in the upstream degraded areas where reforestation of need is higher for most.

When your project makes contributions to the local population in the target area, without respect and without efforts to uphold equal opportunity, there may be accidents because of the jealousy of some. This not only generate negative impacts disturbance on your projects, but especially will create significant breaks at the community level in your target area.

When PRODAIRE implemented training on seed production, we invited all interested participants through training through the extension structure throughout the target area. At this time, we have established several criteria to confirm the motivation, experience and ability of candidates as follows. (1) And have to convert at least 5 small pools necessary for seed production, (2) Having the ability to feed the brood, (3) Supply Stable water ponds throughout the year, (4) Have experience in conducting fish farming for over a year.

The PRODAIRE provided a minimum number of spawners and technical training for candidates training on seed production. These candidates are in charge of all other necessary costs, including preparation and planning of ponds and breeding sires, etc. Thus, these criteria constitute the minimum conditions for the successful production of juveniles.

As part of the extension of the fish with the LIFE model, training must be given to all applicants who have fulfilled the conditions required by the project. Once the beneficiaries of the selected training, PRODAIRE invites everyone living around the training site. Moreover, even if activities such as the production of fry are for a number

limited recipients is the fastest way for a successful extension while respecting the principle of equal opportunity where training is open to the public under certain conditions.

3) Follow-up after training on fish farming

The PRODAIRE conducted several follow-up sessions for farmers who wish to practice fish farming after training.

When the peasants who received training start fish farming, they need to strengthen primary investments rice bunds, buy fry, etc. Since the rice-fish farming starts with the irrigation of the rice field and ends after the rice harvest, it is quite difficult for farmers to ensure a certain budget for primary investments for fish farming. To solve this problem, the project sought ways to involve the agricultural service centers (ASC) and financial institutions (MFIs) (see the User Manual of the model, Annex 11: Example of the development of fish farming activities with the use of the Agricultural Service Center (CSA) and banking institutions).

The LIFE model has no case to hold the target population because it gives more priority to grasp individually population. However, the model does not prevent the peasants to organize their own results as individual contributions. In Region Alaotra Mangoro, farmers who have received training on fish farming have formed several associations of farmers. These groups have endorsed requests for funding from the Bank of Africa (BOA) for primary investments necessary to conduct fish farming. The PRODAIRE assisted them in the preparation of underwriting issues as a follow-up activity.

It is important to exploit customers and sell products fry once farmers fish farmers who have been trained begin producing fry the corporate ladder. The PRODAIRE supported them for the promotion of sales of fingerlings, including preparing posters and flyers as monitoring activities. We also showed three options to fry producers to sell their products, namely: (1) direct sales to the pond by the producer, (2) the sale through the agent, (3) the sale through the agent with support for access to credit from banking institutions; and we also supported to promote such sales with local NGOs (see the User Manual, Appendix 13: Example illustrated the system of supply of fingerlings for fish farming).

3. The key success factors of fish farming and recommended techniques

1) Three key factors of successful fish farming

A successful fish farming requires three main factors: the fry, food and technology. If you are considering the fish in your area of intervention, you must consider the allocation of these three factors, and consider how to develop them.

In the extension of the fish with the LIFE model, emphasis is put on how the technology owned by the local population, that is to say the contact person can be popularized to others in the neighborhood. In a way, the extension system of the LIFE model is very effective to spread an existing technique in a place with other people in the area.

In the Alaotra Mangoro region where PRODAIRE popularized fish farming, some donors such as FAO has already implemented the extension of the fish before the arrival of the project. We were able to identify a resource person, a staff of SCAA (private company) which had jurisdiction to give training on fish farming, and the SCAA company had produced and sold alevines royal carp and tilapia.

When PRODAIRE began to popularize fish farming, we provided training to farmers who wished through this resource persons as a trainer. Farmers who have received training bought fry at SCAA swelled and sold the fish to improve their income. However, like most of the parents belonging to the SCAA were stolen before the next season, the company could not produce the fry while many

peasants began to be interested in fish farming. There was no way to get the fry when many farmers were planning to practice fish farming.

Through bitter experience, PRODAIRE decided to change strategy by changing the pisciculture training and training on seed production, after deducting the unstable supply of fry is the biggest obstacle to popularization of fish farming in an area. We believe that stable and permanent seed supply provides smooth extension of the long-term fish.

2) The rice-fish farming and fish pond culture

During the first year of training on fish farming, PRODAIRE promoted both the techniques of rice-fish farming and fish farming in ponds, according to the technical manual developed by FAO. Farmers who received training have practiced rice-fish or fish pond culture according to their convenience. After a year, many farmers who adopted the rice-fish farming have managed to harvest fish, while those who have adopted the fish pond, most have not managed to harvest fish.

The rice-fish farming in fact does not require food for fish that feed on organic matter in paddy field, although it requires a strengthening of bunds of the rice to prevent overflow during floods. However, many farmers have opted for pond fish have stored a large number of fingerlings in the pond with the hope of reaping as much, but did not provide enough food for all these fish. As obvious result, fish stored could not grow well because of undernourishment.

The training on fish farming includes the technique of fertilization for producing plankton to feed the fish by installing a fertilization spot every corner of the pond. However, most fish farmers did not have the ability to properly apply the technique.

Based on this experience, the PRODAIRE recommended farmers to adopt the special rice-fish farming technique from the 2th year. This is because we understand that a technique that does not require a good diet is more appropriate for extension of fish farming in the Alaotra Mangoro Region.

4. The benefits and risks of fish farming

1) The benefits of fish farming

Many farmers are interested in fish farming in areas where the PRODAIRE implemented this activity in upstream areas degraded Madagascar. This is because farmers believe that fish farming is a short-term effective income generating activities if they can harvest, even compared to their main activity, rice farming.

According to the farmers of the region, there was an abundant fishery resources in lakes, along the rivers and canals around Lake Alaotra, which enabled farmers to earn as much income over harvesting of fish than rice even a rice field. Currently, there is no possibility to harvest fish in rice fields because of the use of chemical fertilizers and over-fishing in lakes, rivers and canals. Due to these circumstances, the fish demand in the domestic market increased compared to the past. In addition, the state authority decided the closure of the fishery between October and December each year, except for the harvesting of fish raised in ponds. As the price of fish increases during the closure of the fishery, fish farmers can s'

Certainly, the recommended rice-fish farming technique by PRODAIRE requires several conditions, including the rice fields of building bunds to prevent overflow in case of flooding, or the use of chemical fertilizers in the paddy field. But it can promote culture in rice fields is the main activity in Madagascar; and do not require food, one of the success factors mentioned above. In other words,

the rice-fish farming allows farmers to reduce considerably the cost price of fish farming.

Considering the current technical level of fish farming in the highlands of Madagascar, the rice-fish farming is most appropriate in relation to the pond in fish farming, and it must be one of the ways for farmers considering the sector as AGR to succeed.

2) The risks in conducting fish farming

Consider the rice-fish farming is effective to improve and diversify the sources of income for farmers. However, this activity involves risks, including the following:

(1) Overflow due to rainfall

As mentioned earlier, the rice-fish farming requires the strengthening of paddy dikes to prevent overflow due to precipitation. Although the same risk arises for the basin in fish farming, rice-fish farming requires more labor and cost since the dike strengthening is longer.

There was a case of a producer of fingerlings formed by PRODAIRE which built its ponds near an irrigation canal, which saw its basin completely demolished following flooding caused by heavy rains. This event has arisen just after the producer has managed to produce fry, heavy rains have completely destroyed the levees carrying the entire infrastructure. Thus all the fry are lost although most of the parents were saved by the owner before the total collapse of the basins.

It is often necessary in the fish farming activity to take into account the risk of natural disasters and to take in advance the necessary measures.

(2) predators

Fish high in rice fields may suffer some damage from predators such as carnivorous fish, birds and snakes. Carnivorous fish are very abundant in the waters upstream in Madagascar, it is essential to take the necessary measures to prevent these carnivorous fish from entering the rice field by attaching fine mesh filter on the water inlet hose before irrigate the rice fields. As rice is usually shallow, fish are also likely to be eaten by birds or snakes. One can for example set up scarecrows to keep birds ...

(3) Vandalism

Aside from natural predators, theft from the fish farm are inevitable. While PRODAIRE has implemented its activities, the Malagasy economy remains stagnant because of political instability, so that farmers are in a difficult economic situation. In these circumstances, acts of theft from fish farms were recorded at different locations. Fish farmers need protection against theft, with bamboo rods and / or thorny branches in their pond. However, the reality is that one can hardly avoid acts of theft on the farm.