EXTENSION

THE ROLE OF EXTENSION IN VILLAGE AQUACULTURE DEVELOPMENT

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1. INTRODUCTION

Extension, in this context, concerns the actions necessary to promote, propagate and spread the practice of fish farming.

Small-scale rural fish farming or village fish farming is generally of the subsistence level, with the aim of converting locally available household scraps, wastes, manures and agricultural by-products to animal protein (fish), using small financial inputs and almost only family labour alone.

With the exception of a few individuals, farmers in most African countries belong to the low-income category. They do not have cash or savings and their purchasing power is low. These potential fish farmers cannot afford to pay salaries and, even less, pay back for hiring heavy machinery for pond construction. He has only his hands, and those of his family, and a hoe or a spade. Simple techniques, therefore, are required to permit the maximum number of farmers to benefit.

Village level fish farming development should always be adapted to the socio-economic and cultural conditions prevailing in the village. The proposed fish farming system must be adapted to the farmer's capabilities and to his surroundings.

When propagating a new technique, the duration of extension activities is very important. The aim of extension in fish farming is to get the villagers into the habit of raising fish in ponds, just as they are in the habit of growing cassava or maize. The creation of new habits takes a long time.

The key person for the success of extension programmes is the field extension worker. The training of such extension workers is of capital importance and should be carefully planned. A large part of their training programme should consist of practical work to be carried out in a fish farming station.

2. ACQUACULTURE EXTENSION SERVICE

Extension is an informal educational process which aims to teach rural people how to further improve their standard of living by their own efforts, for the benefit of the individual, the family, the community and the nation (Bradfield, 1966).

Fish farming, as an economic and social activity, cannot develop successfully without extension work. An efficient extension service needs qualified extension agents, a unified command structure and the financial resources required for the planned extension activities.

2.1 Staffing

An extension service needs personnel, vehicles, training programmes, a minimum of facilities and financial resources. If there is already an existing fish farming extension service, existing extension personnel will have to be redeployed after their participation in a refresher course.

There are generally three levels of extension personnel: the village extension worker, supervised by the regional extension agent and the extension officer in charge of the programme. This is only an indicative scheme and the organisation of an extension service should be flexible. It will usually be most convenient if the administrative and regional set-up of the extension service fit the framework of the general administrative organisation of the country. In this way, the facilities already in place at existing administrative levels can be used (Benor and Harrison, 1977).

The number of extension agents required for the implementation of an extension programme depends on the total number of villagers living in a given area and the number of families which one village extension worker can reasonably expect to cover.

The number of potential fish farmers to be visited regularly by the village extension worker depends on different factors such as the density of population, the roads system, etc. If the fish farmers are isolated and widely dispersed, the extensionist will, maybe, visit only 3-5 farmers a day. When they are living close together, for instance in one valley, then about 5-10 farmers could be contacted every day. This is particularly true during the first year of extension activities when the village extension worker has many tasks to perform (pegging the ponds and the water supply canal, soil survey, etc.).

The regional extension agent supervises and organises the work of 8-10 field extension workers and reports to the extension officer.

2.2 Training of extensionists

The extensionists should be trained in such a way that they can perform all the tasks required to promote the practice of fish farming

at the village level. Their training should be very positively oriented to field work.

Extensionists are generally trained in the country during the first phase of the extension programme, by experienced extension officers.

The duration of the training, depending on the educational level of the trainees, varies between 4 and 6 months. Once trained, it is very important to plan regular refresher courses or in-service training courses for the village extension workers.

2.3 Equipment

Each extension worker should have sufficient mobility to visit the farmers once a week or once a fortnight. The means of transport is generally a bicycle or a motorcycle.

Each village extension worker should be provided with some small field equipment, such as a tape measure, a small seine, handnets, litmus paper, spring balances, notebooks, etc., and audio-visual aids, as required.

2.4 Audio-visual aids

Audio-visual aids are tools for the extension worker to use in order to make teaching more effective. They do not replace personal contacts between the extension worker and the audience (Bradfield, 1966).

The simplest types of 'visuals' are real objects (such as a net), samples and specimens (feed or manure), models (such as a monk), photographs and blackboard.

Two other types of visuals are flannelgraphs and flip-books. Flannelgraphs consist of a nearly vertical surface of a rough textured cloth on which symbols can be placed which are backed by similar cloth, sandpaper or flocking. The backing holds the parts firmly in place on the cloth surface. The main limitation of the use of flannelgraphs is that they can only be used indoors because when a breeze blows it would scatter the parts used for a flannelgraph presentation. Therefore, many extension workers prefer to use flip-books. They are made with paper pages fastened between two rigid covers. The flip-book is opened out by the extension worker so that the covers form a stand. Each page has a picture related to the particular point in the extension worker's talk (Bradfield, 1966).

Posters and wallcharts are also useful since they constantly remind the villagers of the principal points of the fish farming extension programme.

Projected visuals such as colour slides, filmstrips and cinema films are also sometimes utilised but their use is not always possible in the field.

3. PHASES OF EXTENSION WORK

Generally speaking, extension activities are developed in four consecutive phases, starting with actions to make villagers aware of fish farming.

3.1 Making villagers aware of fish culture

This is the phase when the villager learns of the existence of the idea of raising fish in ponds but he knows little about it.

The extensionist has to explain the idea using different teaching methods. He will discuss the idea during a meeting in the village. Not everybody will be interested but the aim of the meeting is to develop interest in fish farming.

Depending upon the cultural level of the peasants, the extensionist can use audio-visual aids such as wallcharts, or flannelgraphs display, flip-books and colour slides. In this way awareness and interest in the new idea of fish farming can be created.

The extensionist can also distribute extension leaflets that are left at the village and farmers will discuss the content among themselves.

Radio programmes concerning fish farming can also help to create awareness and interest by informing the villagers.

3.2 Motivation

Once they are aware of the possibilities of fish farming, some of the villagers develop interest in the idea and seek more information about it, possibly asking the extension worker or discussing the matter with a friend who is already involved in pond culture. The extensionist should now motivate the interested villagers and one way to do so is to organise a demonstration or a visit to one of the existing fish farms. There, on the spot, the farmer can obtain all the required information and finally decide whether or not it is worthwhile to try fish farming, on a small scale, as a kind of trial.

3.3 Active extension

This is the phase where the field extension worker helps the villager to build his pond, teaches him how to stock, and fertilize the pond, and how to feed the fish, etc. The extension worker visits the farmer as often as necessary to give him advice and to carry out demonstrations, such as the preparation of compost, sampling of the fish, etc. The field extension worker should teach the new fish farmer all the skills he should know to become an efficient fish farmer.

3.4 Follow-up support

The training of a new fish farmer takes a long time and follow-up support is needed to help the fish farmer to improve his production. The farmer should not be left alone before he has mastered all the

techniques involved in fish farming. If left alone the farmer will not be able to solve his problems, will become discouraged and eventually will abandon the pond because of the lack of support from the extension service.

4. DIFFERENT METHODS OF FISH FARMING EXTENSION WORK

In a number of African countries, village fish farming started in the fifties and numerous fish ponds have been constructed in rural areas. The status of fish farming in Africa at the end of the fifties is shown in Table 1.

For several reasons, the development of rural fish farming in Africa came to a standstill in the early sixties and many farmers abandoned their ponds. These ponds still exist in some countries such as Kenya and Zaire and their rehabilitation is possible. Such abandoned ponds have already been rehabilitated successfully, for example, in the Congo, Gabon and the Central African Republic.

When planning fish farming extension, there are generally three different cases, requiring different approaches. The three different cases include:

(i) ponds exist but have been abandoned;
(ii) no ponds exist, but villagers are interested in starting fish farming;
(iii) no ponds exist and potential sites are available, but the villagers have not so far, shown any interest in fish farming.

Each of these three cases will require different extension methods to build up confidence and to convince the villagers that fish farming is a useful activity.

These three cases, and the extension methods to be used in each case, are described in the following sections.

4.1 First case: Ponds exist but have been abandoned

In many countries, rehabilitation of existing, but abandoned fish ponds, will be the first task of a fish farming extension service.

These ponds will have probably been built during the fifties and it requires understanding of reasons for subsequent abandonment and also justifications for rehabilitation of these ponds.

The reasons why village level fish farming came to a standstill are generally the following:

(i) the species used in the fifties were not fast growing and with *Tilapia macrochii*, *T. zillii* and *T. rendalli* the yields were only between 800 and 1,000 kg/ha/year;

Table 1 Status of rural fish farming in Africa (1958–60)
(according to Meschkat, 1967, completed by Vincke, 1985)

Country	*Year of starting*	*Number of ponds constructed*	*Surface area (ha)*	*Production (t)*
Burkina Faso	1956	82	4	2
Burundi	1950	352	65	26
Cameroon	1952	9,000	123	61
Central Africa	1952	11,700	117	117
Congo	1953	12,176	125	125
Gabon	1956	2,000	40	16
Ghana	1953	30	3	3
Ivory Coast	1956	340	8	8
Kenya	1957	12,200	610	192
Liberia	1959	55	17	7
Madagascar	1950	70,000	1,400	840
Mozambique	1956	250	10.5	9
Nigeria	1951	–	61	36
Rwanda	1950	448	84	34
Tanzania	1949	8,000	80	64
Togo	1954	53	8.5	9
Uganda	1958	11,000	410	670
Zaire	1947	122,067	4,058	1,406
Zambia	1961	1,231	100	89
Total		260,984	7,324 ha	3,714

(ii) without adequate fertilisation of the ponds and without regular supplemental feeding of the fish grown in waters with poor natural production, the yields were low and the farmers became discouraged;

(iii) the rearing techniques were not adapted due to the lack of basic scientific background required to obtain high productivity;

(iv) the fish ponds were poorly constructed;

(v) the lack of well trained extension personnel able to train and to teach the farmers.

The extensionist should explain to the farmers that there are now new species and new, more profitable techniques. He should visit the abandoned ponds with the farmers and make sure that they can be rehabilitated. Pursuing the discussions, he should invite the owners of the abandoned ponds to visit the nearest fish farming centre where they could assist in harvesting a pond. During this visit the villagers will obtain all the information concerning the rearing techniques and the yields obtained which will have some effect on him. Some of them will be convinced and will eventually rehabilitate their old ponds and start fish farming again.

In this case, it is very important that the field extension worker visit these farmers regularly to give them correct advice at the most suitable time.

The construction of a demonstration pond near the village is also a good means of convincing farmers, especially if the demonstration pond is one of the abandoned ponds, rehabilitated at the expense of the extension service, in agreement of course with the owner.

4.2 Second case: No ponds exist, but villagers are interested in starting fish farming

This case requires the understanding of why the villagers want to raise fish in ponds. Generally they learn about the possibilities of fish farming through friends or inhabitants of other villages already involved in fish farming.

These villages are already motivated and the extensionist should, as soon as possible, organise a meeting with the interested farmers and their families. During this meeting the extensionist should ascertain how much knowledge the villagers already have about fish farming.

After this first meeting, the extension agent should invite the villagers to visit existing ponds in a nearby village where they can discuss with the fish farmers. After this preliminary visit, the extensionist can then organise another meeting and explain in much

more detail (possibly by using some audio-visual aids) what fish farming really entails (choice of the site, construction of ponds, fertilisation, etc.).

As follow-up to these meetings and field visits, some villagers will eventually ask the extension worker to visit several sites that they have identified for pond construction. It is very important, at this phase, that the extensionist makes a survey of the proposed site and decides if they are suitable, or not, for pond construction; if not he should look for a better site. It is thereafter important to fix a date for the start of the pond construction and the extensionist should plan regular visits to help and encourage the farmer, from the construction of the pond until the stocking.

4.3 Third case: No ponds exist, but potential sites are available

This case concerns villagers who have no ideas about fish farming and who have no motivation. They will not, as in the second case, make contact with the extension service, but it will be the extensionist who will have to make the first steps to contact the villagers.

The extensionist will have to organise a first meeting in the village. The best way is to have the meeting organised through the local authorities who could introduce the extensionist when starting the meeting.

The extensionist explains to the villagers what fish farming is and mentions the existing sites where ponds could be constructed. A slide projection will help to make villagers aware of fish farming. Some villagers will ask questions and the extensionist will explain the advantages of the practice of fish farming in the village:

(i) few inputs are needed, other than manual labour (family labour) for pond construction; according to experience, it usually takes between 20 and 25 man/days to construct a 100 m^2 pond;

(ii) village fishfarming is only a part-time activity for a farmer and his family;

(iii) low price fish feed ingredients and pond fertilizer are available in almost all the villages;

(iv) fish is produced in the village; there is no need for transport and fish is consumed fresh without storage problems;

(v) fish farming often leads to fuller utilisation of available land;

(vi) fish culture helps reduce animal protein deficit amongst villagers;

(vii) fish farming usually raises farmers' income.

At the end of this preliminary meeting, the extensionist should propose to visit, on the following days, the sites available for pond construction.

The number of participants during the field visit will give an indication concerning the success of the first meeting.

On the spot, at the available sites, the extensionist will explain and discuss again about pond construction, water supply canal, fertilization of the ponds, feeding of the fish, etc. He tries to convince the villagers but they are still not decided and they want to discuss the idea amongst themselves, in the village. Finally, at his next visit, the extensionist will find some villagers who have been motivated and they will want more information.

Here again, a visit to existing fish ponds in another village will allow the farmers to make up their minds. They will eventually discuss the matter in the village and at the next visit, the extensionist will find some farmers who want to start the construction of ponds.

The extensionist should then discuss the work plan and decide, with the farmers, on the date of commencement of pond construction.

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