

Aquaculture is new in Zimbabwe and despite its potential, little attention has been given to this sector. With the increasing population, there is a greater demand for alternative sources of protein supply, in particular, for the rural people of Zimbabwe who make up about 70% of the total population. Current fish production from Zimbabwe is far less than the demand (in 1986, production from aquaculture and capture fisheries was 1,750 t and 17,500 t, respectively), and it was estimated that at the present rate of fish consumption, there will be a need for 160,000 t of fish by the year 2000. Fish production in the context of



A complex integrated system used in training: vegetables (tomatoes, 1), chicken house over the pond (2), fishpond (3), and crop (maize) (4).

Simple Aquaculture Training for Rural Development in Zimbabwe

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Gathering of visitors during the open/fish day at the Chaminuka Training Centre. It is an annual event and an opportunity to demonstrate advantages of aquaculture in rural development.

rural development in Zimbabwe would not only be for alternative and cheap animal protein supply for the rural poor; it would also help control malaria and bilharzia by releasing fry/fingerlings into natural and artificial water bodies; create employment opportunities for rural youth through self-employment or cooperative aquaculture ventures; bring unutilized marshy lands into productive use; and encourage balanced and optimum food production through integrated aquaculture by rural farmers.

The first and foremost task in any sectoral development lies in the availability of skilled manpower. Realizing this, the Ministry of State (Political Affairs) introduced an aquaculture training program at the Chaminuka Training Centre (with the assistance of UNV/UNDP). The aquaculture course introduced in 1987 was the first such formal training in Zimbabwe and is now being run for the fifth year. The highlights of this training,

which is vital in rural development, are discussed below.

Recruitment of Trainees

Trainees from all over the country are recruited every year to undergo a two-year agriculture course at the Chaminuka Training Centre. The main criteria of selection of trainees are: 1) rural youth (men/women); 2) disadvantaged persons who failed to obtain formal qualification due to financial or other reasons; and 3) willingness to go back to rural areas to embark on rural development projects. Priority is given to women as they are regarded in Zimbabwe as more active and linked with most of the communal farming activities.

Aquaculture and Rural Development

Zimbabwe has abundant water resources in the form of dams, lakes,

rivers and underground water being used for irrigation, recreation and/or water conservation. There are also some marshy lands unsuitable for crops. These resources are mostly in remote rural areas where there is a need of productive and effective utilization of resources to improve living standards. Considering the background of trainees and the objectives of training, it was realized that aquaculture training should be simple



"Unity is strength" demonstrated by the trainees pushing a roller to compact the embankment of a pond.

so that it has easy acceptance by rural youth and farmers. Aquaculture is a new concept for rural Zimbabwe and the only way it can be initiated and can progress is through integration of existing farming activities, such as poultry raising, vegetables and crop growing with fish farming. These could lead to the most economical ways of food production.

Curriculum

Trainees attend both theoretical (30%) and practical (70%) lessons in General Agriculture, Animal Husbandry, and Aquaculture. They spend equal time in the above three areas during the two-year training period and receive more practical training (more than 70%). The training combines all kinds of farming systems and provides excellent opportunities in integrated agriculture-aquaculture systems. Trainees show more interest in integrated farming than in individual crop farming.

1. During the two years of training, trainees are required to construct a village pond, family pond or integrated pond as appropriate, using simple tools such as hoes, shovels, spades, wheel barrows and spirit level. Although emphasis is given on earthen ponds, seepage rates can be high due to poor soil structure and construction of tanks using locally available stone, sand and polythene sheets is also taught.
2. Indigenous fish are used in the rearing program, so that rural people will take an interest in fish culture. The species selected for training are *Oreochromis mossambicus*, *O. macrochir*, *Tilapia rendalii* and catfish, *Clarias gariepinus*. These species can be



Vegetables (cabbage, rape, pumpkin) grown on the periphery of a pond using pond water and mud. Leaves are used to feed fish and chickens in integrated farming.

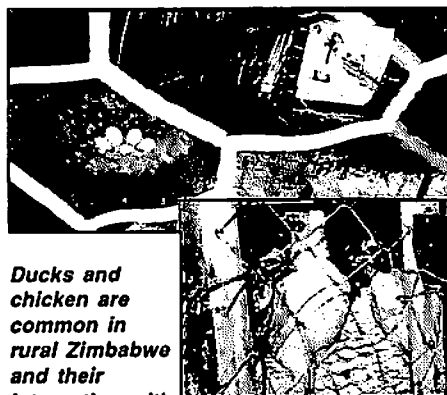
cultured together and it is easy to rear them using organic inputs available in rural Zimbabwe.

3. To overcome the population problem of tilapia, male-only tilapia culture is one of the culture systems adopted in training. Hand sexing to segregate males is being followed and our results show that it is 80-90% successful. The carnivorous catfish, *C. gariepinus*, is also used in the rearing program to control tilapia populations.
4. Integrated aquaculture is the single most important area in the training syllabus since it can play a significant role in rural development. In pursuing the objectives, chicken-fish, rice-fish and vegetable-fish farming are emphasized.
5. Inexpensive fish preservation is the goal of processing. Sun drying and smoking of fish using locally available wood is practised. Dried fish are in great demand in rural areas where it is hard to obtain frozen fish or meat.

Practical Training

Trainees attend daily theory and practical classes on aquaculture. The following steps are followed in practicals:

- trainees are responsible for managing a pond during their training period with provision of daily data collection of the pond on the status and activities done;
- a monthly sampling of fish is carried



Ducks and chicken are common in rural Zimbabwe and their integration with

fish farming could play a significant role in socioeconomic development. Here, ducks and chicken were grown over the fishpond for economic utilization of resources.



Sampling of fish to check growth rate in a rice-fish pond.



Fish being smoked using local fire wood as part of the training.

out to check growth and health of fish and to collect other biological information;

- a monthly report based on pond information collected during the month is required to be submitted by the leader of the training pond (consulting with the members of the pond);
- a fish day/open day is organized every year to evaluate outgoing trainees' achievements in the presence of visitors where trainees explain their practical experience to the visitors;
- each aquaculture trainee submits a final aquaculture report (for assessment) of the pond managed during the training period.

The aquaculture training introduced at the Chaminuka Training Centre may be expanded to other centers of the Ministry or other agriculture training institutes. Pilot subjects on integrated agriculture-aquaculture in rural Zimbabwe would draw the attention of rural people. The constraint of our training is that there is no followup by ex-trainees. They complain that there is no credit to start their own project.

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