

KENYA AQUATICA

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EDITORIAL NOTE

The need has been felt for a long time for a bulletin covering aquatic resources out-puts of the country quickly and comprehensively. The Board of Management of Kenya Marine and Fisheries Research Institute realised this need and directed the Institute to take immediate action for ensuring that information on aquatic resources is compiled for easy communication to the people.

The editorial group has decided to start reporting activities related to aquatic resources under the title "KENYA AQUATICA". As far as possible efforts will be made to include short scientific communications, critical reviews, seminar proceeding and other ad hoc publications. This comprehensive coverage will be possible only through cooperation of various Institutions, Departments, Societies and individuals who are concerned with aquatic resources.

Kenya Aquatica is a technical and extension series for rapid dissemination of information on aquatic resources and allied information from Research Officers, Fisheries Officers and any individual for transfer of Technology to the fishermen and industry and any other relevant information needed for National Development.

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M O M B A S A

HISTORY AND DEVELOPMENT OF FISH CULTURE

Introduction

This is taken from a paper 1 read at a training seminar for Fisheries Assistants at Matuga Community Centre and basically the speech was about history and development of fish culture. This has become an important issue in most developing countries, more so in countries of the African and South East Asian regions, and it might be of interest to examine the reason for this. The situation is slightly different in most developed countries.

With the continued expanding population, many of the developing countries have been stretched to the limit on their effort to meet the increasing demand of protein food. Second it is now evidenced that in these countries the normal source of supplies of protein food e.g. beef and other natural food production are always geared towards export market leaving very little for domestic need. In addition with rapid studies made in the development of fisheries the world over, it would appear that except in certain few countries, the fishery resources from natural sources, are being exploited to the limit. Further evidence available do not indicate increased food production from this source inspite of the E. E. Z. ! The introduction of E.E.Z. will perhaps help in equatable distribution of the fish resources and no more.

In a nutshell therefore development of fish culture is looked upon as a further instrument which will increase protein food supply. Under these circumstances, with increasing population in most countries coupled with dwindling food supply in a global scale, fish farming in natural and artificial ponds will assume a growing importance in national and world food supply planning: In most European countries and America, the requirements of animal protein are primarily covered by consumption of beef, pork etc. and the development of fish farming though not ignored has perhaps been geared towards production of specialised fish food - not for general consumption but rather to meet the demand of special tastes and dishes.

History of Fish Culture:

Fish culture was probably initiated in mainland **China** and **India** several thousand years ago and in Japan shortly thereafter. In this sense, it may be regarded as indigenous to these countries. The development in virtually all other countries came much later.

Fish culture practises proper started in India as early as 1126 BC, mainly in the eastern states of Bengal, Bihar and Orissa. Here great portentialities for this work were known to exist, fish being the main diet of the rice-eating population of this region. In the plains and deltar regions ponds were stocked with local species: **Labeo rohita** **Catla catla** and **Labeo calbasu**. Attempt at exotic species came much later. In 1841 gourami (*Osphronemus gorami*) was first tried and by 1865, this species had established itself as a major culture fish.

Expansion of fish culture into the whole of India did not come about until after the second world war, when soon after attaining independence, the government of India established Central Inland Fisheries Research Station at Culcutta to conduct the scientific investigation for proper appraisal of the inland fishery resources. The work of this centre has led to improved culture methods, including artificial breeding techniques.

In Indonesia, probably the first development was the establishment of the 'tambake' system for brackish water fish culture between 1200 and 1400 BC under influence of the Hindu Empire. In other South East Asia countries, the movement of Chinese traders and the establishment of trading posts was perhaps responsible for introduction of fish culture practises, particularly carp culture.

In the European region, fish culture in warm water ponds goes back to the middle ages, and, in France, Spain, particularly, was tied to religibus practices of the time. Early practices confined themselves to carp culture for only recently has attempts at other species, particularly, *Tilapia* culture been made.

Fish farming is a recent practice in Israel. It was not until 1937 when actual fish culture (carp) was first introduced, following the arrivals of settlers who had learned the fundamentals of fish culture in Cental Europe. These settlers brought a number of common carps from Yugoslavia. The first ponds were located in the valley of Beth-shaan, which has many brackish water sources, and marshy land not easily put to any other agricultural use. The practice has since then greatly improved, and with the application of scientific knowledge, Israel has been able to boast the highest limit production rate.

As in most new world countries, fish culture did not start in the North American Region until 1850. It was the immigrants to the new world who

transplanted fish from water to water as they move inland, and by the beginning of this century numerous European species had been introduced to these new waters, sometimes with adverse effect on the indigenous species. In this sense thereof it could be said that fish culture is not indigenous to the North American region. There is no evidence that the fish culture was practised in the pre-Columbus era.

In our discussion so far no mention has been made of Tilapia culture. With the exception of Africa, Tilapia culture as we now practise it has been unknown, and except with Israel, and Malaysia in the South Asian regions, Tilapia culture is very limited. In Israel, Tilapia culture now rivals carp farming, and with improved methodology and techniques, Tilapia culture will continue to form a greater proportion of fish culture production.

Soon after the first world war, fish culture was advocated as additional source of food supply. It was as a result of this world wide campaign that fish culture as now practised in Africa, was first introduced into a number of African countries.

Production of fish ponds started with the introduction of cold-water species, and by the beginning of the second world war in 1939 trouts had been introduced in Kenya, South Africa, Morocco and Lesotho.

The use of Tilapia for fish culture had been advocated in the earlier years of fish pond development in Africa. The end of the second world war saw another concerted campaign to popularise fish culture in Africa, sometimes without regard to methodology and scientific practices, and by 1960 Tilapia culture was widespread almost in all countries of Africa. Most of those early ventures were failures. They did not produce fish of sufficient size for domestic consumption, and this led to lack of enthusiasm on the part of rural farmers, and soon fish culture practices fell into disrepute. In between the years attempts were made to look for other suitable fish for fish culture in Africa, as it was now obvious that with exception of Trout culture fish pond culture was a profound failure. Carp was introduced in Nigeria in 1954, and carp farming took off in 1959. By 1969, carp had been introduced to a number of countries in Africa. Carp was first introduced in Kenya in 1968, when the first batch was sent from Kajanzi station in Uganda. The second lot came from Japan in 1969.

Some strategies of fish culture development

I have so far discussed the constraints on food supply, and which perhaps.

more than anything else, led to wide spread and development of fish culture either between the wars or after the end of the World War 11.

Many other factors which do naturally contribute towards the development of fish culture, particularly in developing countries are:-

(a) The existence of vast areas of lands abandoned as unfit for any other agricultural land use. These include swamps, dams built for other agricultural use other than fish farming. This situation attains in most of the Inland countries of Africa, particularly Uganda, Zaire, Zambia and Kenya.

(a) The presence of relatively large areas brackish water, also found unfit for any other use agricultural land use. This situation is prevalent in most of the South East Asiatic Countries, particularly Indonesia, Phillipines, and South India, where shrimp culture is now major source of prawn.

(c) The general desire among locals to go for live (fresh) fish have meant that in rural areas even in areas where processed fish could be made available, there exist ready market preference for fresh cultured fish.

The development of fish culture during its rather long history has taken various aspects. However the common practices, have been governed in their choices by early access to cheap water, restricted land use and availability of suitable fish species.

Restricted land use has meant a search for methods which would increase fish pond production without adversely affecting or interfering with other agricultural and industrial usage. These considerations often, lead to various types of fish culture. In Japan for example, land constraint as a limiting factor, has led to the development of intensive fish culture methods including the running water system and paddy-cum-fish, fish culture. Both of these recent developments have found their ways into other developing countries as well.

In Israel, where land is quite a limiting factor in almost all human activities, concerted Scientific investigation during the past forty years has made it possible to develop Tilapia cultural (hybridization and monosex culture) which now rival carp culture. Apart from constraint about by land limitation other factors which should be considered in the development of fish culture species are:-

- (1) Adaptability of fish species to artificial fish food.
- (2) Hardness on the part of fish species to diseases.
- (3) Ability of such fish species to spawn and make fry available at regular periods.
- (4) Above all pond fish selected should be able to reach acceptable marketable size within a reasonable period of time.

Conclusion:

I have found it difficult within the framework of this short paper to cover in details all aspects of fish culture: history and development. What has transpired is perhaps a summary of a very wide topic. I have merely confined myself to elements of fish culture history and development, methods and propagation practice, and if what is covered above could in a small way contribute to a further understanding of the need for fish culture, the paper shall have served its purpose.

Allela Samuel O.