AQUACULTURE : PROSPECTS AND CHALLENGES IN TANZANIA

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SUMMARY

Tanzania with its long coastline and endowed with large inland fresh water bodies such as lakes (Victoria, Tanganyika, Nyasa, Rukwa, manmade Nyumba ya Mungu etc.) and rivers (Ruvu, Rufiji, Ruaha, Wami, Pangani etc.) has an ernomous potential for aquaculture production. The worlds' fisheries resources are declining on a global basis while both the demand and the cost of utilization is on the increase. Aquaculture, an opportunity based upon science and Technology, has the potential to supplement the demands based on natural resources in the face of ever increasing world population. Although aquaculture is less developed in Tanzania, average production stands at 1400 kgs/ha/yr on average pond size of 150-500m^2. Thus aquaculture has an ernomous potential in Tanzania. This paper gives some highlights on the prospects and challenges of acquaculture production in Tanzania.

INTRODUCTION

Aquaculture is the farming of plants and animals in water. It is one of the non-traditional forms of agriculture involving the controlled utilisation and or farming of aquatic organisms including algae, plants, molluscs, crustaceans and fish. Aquaculture is therefore different from "fisheries" which is the controlled harvesting of fishes from natural waters without much husbandry inputs. Some of the important algae include the red algae e.g. (Euchema spinosum, Euchema Cottonii) and the Brown algae (Undaria spp) found in the cost of Zanzibar which are rich in iodine and agar both of which are used in pharmaceutical industries.

The World aquaculture production already equals 15% of the total world catches (Brink 1996) and aquaculture industry is growing at an annual rate of 14% (cf growth rate of livestock 0.6%). Aquaculture is therefore viewed as a strategic industry for future world food production. Thus aquaculture is a systematic form of human intervention to enhance production through proper husbandry practices viz. brood stock, spawning, fry and fingerling production, feeding and disease control.

Although the history of aquaculture in Africa is rather fragmented due to poor record keeping; aquaculture seems to have existed since 2500BC during the ancient Egyptian times when the drain-in systems of the Nile delta were operational. These water reservoirs were stocked with fish from natural waters of the nile. However, despite of these early records, aquaculture development has been slow primarily due to:

(i) Marginalization of the sector by Governments including lack of clear policy on fish farming.
(ii) lack of qualified personnel with practical experience.
(iii) lack extension officers to guide farmers.
(iv) Wrong placement of the sector with Government Ministries of Uganda, Tanzania, U.K. etc.
(v) lack of requisite resources and technology for the development of fish farming and fish ranching.

Fish farming is a stable source of family income, a more efficient way of converting feed protein and energy into consumable products than any other farm animal production systems. Fish farming can easily be integrated with other agricultural production systems e.g. rice-fish and rice-pig culture (Rina Vellasco, 1995 pers. comm). In addition fish farming provides a complete and sustainable utilization of both human and natural resources.

In general, aquaculture production is a promising subsector of fisheries. It offers the best opportunity for increasing the supply of fish and other aquatic organisms for both local and export market.

AQUACULTURE PRODUCTION PROSPECTS IN TANZANIA

Inland and marine catches in Tanzania are estimated at 365,000 and 75,000 tones respectively per annum and contribute substantially to human protein source (Division of Fisheries report 1988). Thus Tanzania depends more on inland fisheries with the main species being the Nile perch (170,000 tones), tilapias (55,000 tones) and catfishes (20,000 tones). Thus marine waters of Tanzania are less rich than those of other parts of Africa. At any rate capture fishing is undoubtedly not a sustainable way of fish production.

FAO (1993) statistics indicate that fish provides 29% of total animal protein consumed by Asians, 19% by Africans and 8% by latin Americans. However the average capita fish consumption in Tanzania per annum is 16.0 (kg cf.beef 8.0 kgs, eggs. 16, milk 20 litres) which translates to 3.0gm of protein per day or 4.5gm of total protein supply and 32% of

the animal protein supply (FAO 1993).

Due to lack of up todate data on functional ponds and their productivity, it is difficult to give a realistic information on aquaculture status in Tanzania. Aquaculture practice in Tanzania started way back in 1949.

By 1963 Tanzania had about 10,000 ponds covering an area of 1,000 ha. However, today only about 10% of the ponds are believed to be operational. New Aquaculture development thrusts are currently evident in Ruvuma, Singida, Lindi and Arusha regions. In 1985, the total fish production was estimated to be 70 - 100 metric tons from about 2000 - 3000 ponds covering an area of about 200 hectres (Bwathondi 1996).

Despite the percent increase in the number of ponds, it is now estimated that fish production from aquaculture is below 50 metric tons per year.

Available aquaculture information for Tanzania is given in Tables 1 and 2:

AQUACULTURE PRODUCTION CHALLENGES IN TANZANIA

In Tanzania, the government in collaboration with Non-Governmental Organizations have made efforts to promote small scale fish farming. However, the main approach has been the wholesale importation of technologies and systems developed elsewhere without giving due considerations to the local biological, ecological and socio-economic realities. This has been one of the major causes of failures in aquaculture production in Tanzania. There is therefore a need for adaptive research and development especially tailored to the poor African farmer. If our nation has to promote the aquaculture production, there is need to address the following challenges.

Establishment of clearly defined Aquaculture development policy

From the administrative organization within the Ministry of Natural Resources and Tourism, the fisheries division seem to be no-man's business. The division is supposed to have offices at regional, district as well as village levels. However, under decentralization policy of 1972, the Regional Fisheries administration is placed under the Regional Development Directors' office (PMO). At the same time, the district fisheries administration is under the Ministry of Local Governments. This institutional framework is a kind of race towards the development of aquaculture, as different administration level give different priorities to aquaculture development. There is therefore an urgent need for timely Government intervention to

Table 1:Aquaculture statistics for Tanzania (1963-1992)

Year	Source	No. of Ponds	Total Pond Area ha.	Average Production kg/ha/yr.	Total Estimted Prod.t/yr.
1963	Ibrahim	10,000	1,000	2,000	2,000
1981	UNDP/FAO	600-1000	60-100	130	-
1983	FAO/GCP	800	-	130	-
1983	Lema, R.	1,000	-	-	200
1988	Dept. of Fisheries	5,000	500	750	375
1992	Mwafenga ,G.L.A	8,611	877.4[1]	1000[1]	1667

[1]Based on four regions activily engaged in fish farming Lindi average production 1.2-2t/ha/yr; Arusha average production 2.2-5t/ha/yr. Source:- Aquaculture Development and Research in Sub-Saharan Africa. National Review, (1994), CIFA Technical paper 23 suppl. P.325

Table 2: Trend of Aquaculture Activity (given in terms of no. of ponds per region) in Tanzania 1975-1992.

	1975	1977	1979	1981	1983	1985	1987	1989
Arusha	18	-	-	56	234	356	497	678
Dodoma	98	80	-	-	33	-	33	-
Iringa	100	184	-	-	-	753	753	116
Kigoma	-	-	-	49	-	241	-	245
Lindi	-	-	-	-	-	63	136	-
Total	216	264	-	105	267	1413	1419	2039

Source: Regional Annual Report (1975-1992)

rectify this anormally. It is even more sound to transfer the fisheries division from the Ministry Natural Resources and tourism to the Ministry of Agriculture and Cooperatives. This is a typical set up in many countries including Kenya and Uganda.

Efficient Extension Services

Efficiency here entails a system equipped with all necessary skills, knowledge and facilities, as well as means of transport. Review of curricula of the fisheries institutes offering certificate and diploma in fisheries clearly indicate some noticeable deficiency in terms of time allocated for the course in aquaculture. Essentially, there is no substitute for intensive training if the expected results are to be realised.

Technical know - how for the farmers

To enhance aquaculture production, short term as well as long-term training opportunities for our farmers is necessary. Sustainable aquaculture production calls for mastery of a number of aspects including water quality management, disease control, feeding as well as routine management practices. Establishment of regional or zonal aquaculture demonstration and research centres would go along way in promoting aquaculture production in Tanzania.

Reliable fish-seed farms

Unreliable fry and fingerling supply is likely to have a negative effect to the farmers. Established fingerling production centres which might combine their responsibility with fish breed adaptation trials are likely to offer a solution to the problems of unreliable supply of adapted fish species for the farmers ecological localities. The same centres might also assist in establishment of practical stocking densities for the farmers.

Research capacity build-up for the country

Records available indicate that research for other farm animals e.g. cattle, pigs and poultry is given due attention while small-stock research including fish is seriously neglected (Bwathondi, 1990 . Unpublished). It is an undeniable fact that no sectoral development can take place without research. There is need to develop relevant adaptive research. Elsewhere in the world aquaculturists are busy researching on the improved genotypes and fish diets in an attempt to increase fish production. With the application of new technology fish yields can easily increase from 500 kg/ha to 1,500 kg/ha.

CONCLUSION

Aquaculture as an emerging industry offers various opportunities to the enterpreneur in a free market system. A degree in BSc aquaculture or as part of the Curricula in Bachelor of Veterinary Medicine or BSc - Animal Science allows graduates to access into all sectors of the industry including management, processing, disease control, nutrition, ecotourism, research, training as well as extension and consultancy services.

Apart from the supply of high quality protein, aquaculture and fisheries in general contribute significantly (5.6%) for Tanzania's total earnings. The sector also offers employment opportunities for the Veterinary profession among others.

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