

## Aquaculture and Prospects of Cage and Pen Culture in Nigeria

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Nigeria lies within the tropics between latitudes 4° and 14° north and longitudes 3° and 14° east. It is bounded on the west by the Republic of Benin, on the east by the Republic of Cameroun, on the north by Niger Republic and it is washed on the south by the Atlantic Ocean. The country which has an area of 913,072 square kilometers is well watered by the rivers Niger and Benue and their tributaries.

The need for rapid development of aquaculture in Nigeria becomes obvious when one views the demand for fish against the requirements for animal proteins, the vast potential for aquaculture production by the government in its third 5-year development plan.

The present population of Nigeria is about 85 million with a per capita animal protein consumption of 24 kg of which 12 kg is from fish. According to estimates, total fish production in Nigeria from all sources amounts to 740,000 tons. With a per capita consumption of 12 kg and a population of 85 million the quantity of fish actually required is 1,020,000 tons leaving a deficit of 280,000 tons. This deficit in fish supplies must be met, but it is unlikely to be from capture fisheries alone. Available data have shown that the coastal waters of Nigeria are poor in fisheries resources and there is a limit to any expansion of capture fishery. The deficit can be met through pond, cage and fish culture.

### Present Status of Aquaculture

Aquaculture is now undertaken in Nigeria at the subsistence level by private individuals and at the experimental level by the government. Total aquaculture production is estimated to be about 76,000 tons annually.

The stage of technological development varies in different parts of the country. For brackishwater aquaculture, development has gone beyond the demonstration stage but has not reached the pilot-scale operation stage. In freshwater aquaculture, technological development in some States is at the pilot scale. This is exemplified by the government fishfarm at Panyam in the Plateau State, and in the Oyo State of Nigeria. In other States such as Kano, Kwara and Lagos, aquaculture development is still at the experimental stage.

The Panyam fishfarm has done much work on common carp (*Cyprinus carpio*) culture and the production of fry. The transfer of such technology to other areas has been made.

The government has established pilot fishfarms at strategic location in the country to demonstrate advanced aquaculture practices under brackish and freshwater conditions.

Under the brackishwater programme about 500 ha of swampland in the River State is for the development of a pilot-demonstration fishfarm which will be operated by individual farmers at subsistence level. These farmers will organize themselves into cooperatives. The species of fish to be cultured are *Tilapia nilotica* and the grey mullet, *Mugil cephalus*. The choice of these species was based on the availability of data on culture practices and ready market for the species. In addition to the pilot fishfarm, another 5000 ha of swampland along the Niger Delta would be developed through private investment and operated mostly on a large-scale commercial level with government providing a favorable climate for investment.

Under the Freshwater Programme, about 600 ha of land for development of pilot demonstration fishfarm are to be located at Kano and Ibadan with *Mugil cephalus*, *Cyprinus carpio*, *Labeo senegalensis* and *Labeo coubie* as cultured species.

### Prospects of Cage and Pen Culture

Cage culture is under experimentation at the Government Research Institute while the old method of pen culture is practised in remote villages of Southern States. Research is ongoing at Buguma in River State on the culture of oyster in rectangular trays. These trays are made of wooden frames and plastic nets. Each oyster tray is 1 m<sup>3</sup> and is supported at about 0.8 m from the ground surface where it is covered at high tide and exposed at low tide. Lagos State is also experimenting on the suitability of iron-framed cage for fish culture in the Lagos Lagoon. A cage is 2 m<sup>3</sup> and made of polyethylene net.

Apart from the strategies embarked upon in pond culture, efforts are to be geared towards the establishment of cage and net culture in the vast available marine, brackish and inland waters in the country. Nigeria has plenty of rivers such as the Niger, Benue, Sokoto Cross River; natural and man made lakes such as Lake Chad, Kamji Lake and Tiga dam which cover an area of about 20,000 ha and are suitable for the establishment of floating cage culture.

Suitable species that could be cultured in freshwater cages and pens include *Tilapia nilotica*, *Clarias lazera*, *Chrysichthys nigrodigitatus*, *Heterotis niloticus* and *Labeo coubie* while in brackishwater *Mugil cephalus* can thrive well.

One of the ongoing fisheries development projects entitled "Fish seed multiplication project" has the objective of producing high quality fish seeds for distribution to fish farmers and for stocking of reservoirs and lakes. This project will be a good source of seeds.

### Economics of Cage and Pen Culture

Of all the cage and pen construction materials, the fishing nets and the anchor will take a lion's share of the capital cost. Bamboo grows in many of the places where cage culture can be established. These can be used as floats and can be obtained at a very low price.

For intensive culture, peanut cake is readily available as feed. The revenue to be generated from such culture will more than compensate for the capital cost and labor input.

### Conclusion

With the availability of natural rivers, lakes, dams, construction materials, culturable species and ready market for fish, the prospect of cage and pen culture is quite bright in Nigeria. Such development will, in no small measure, contribute to offsetting part of the annual 280,000 tons deficit.