A STUDY ON CATFISH CULTURE AT VARIOUS LOCATIONS IN ANAMBRA STATE, NIGERIA

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Abstract

The study was conducted to determine cat fish cultural methods and their effects on production at urban, semi-urban and rural areas in Anambra State. Three communities, each with five sampling stations were selected to represent the study locations. Stocking densities in the rural area were significantly ($P<0.05$). higher than those of the areas. Survival rates and fish production were higher at the rural than at the other locations. They were 93% and 1.72 ± 0.20 kg respectively. The least rate of survival and fish production (90.5% and 1.48 ± 0.26 kg) were obtained from urban and semi-urban areas respectively. The rates of survival and yield could be attributed to higher rate of feeding in the rural than the urban and semi-urban areas. Physico-chemical parameters of the pond water were based on indigenous knowledge system. The use of probe may further reduce mortality rate thus, increasing the fish yield.

The global economic recession has prompted many nations to look inwards for their economic survival. As individuals ventured into new areas for survival, many Nigerians started developing interest in aquaculture (Inyang and Odo, 1996). Fish cultural activities are presently towards innovative culture systems, improved management practices, food security and income generation to the people. The reason for the enlarged interest in that aspect being that fish is relatively easier to produce than other domesticated animals (Akpaniteaku, 2008). Despite the potentials of aquaculture in the country, a number of constraints were militating its development and viability (Faturoti, 1996). In Anambra State, fish farmers of various categories are engaged in fish culture for the purpose of producing fish and generating income for other uses. Indiscriminate use of aquaculture systems, stocking densities, imported feeds and other inputs has given rise to uncoordinated practices in fish production (Akpaniteaku, Pers. obs.). There is therefore need for more investigation on the existing cultural practices. In view of the above considerations, the study tends to compare fish cultural activities at Urban, semi-urban and rural location in the state.

Materials and Methods

The research was based on cultural activities of randomly selected fish farmers who were engaged in rearing of African catfish. Simple random

sampling technique was employed due to logistic problems, which could be encountered in constructing and managing experimental ponds. The research was conducted at three different communities representing both the locations and major agricultural zones in the state (Table 1). In each of the communities five sampling stations were randomly selected. The selected locations (agricultural zones) less endowed with fertile land and therefore had more interest in aquaculture than the zone which was not selected.

Table 1. Selected Locations for the Research

S/NO	Agricultural Zone	Selected Community	Remark
1.	Aguata	Ekwulobia	-
2.	Anambra	-	Not selected
3.	Awka	Amansea	-
4.	Onitsha	Umuoji	-

A total of fifteen fish ponds were sampled on the basis of five ponds per area (Table 2). Assessment of variables was made by observation of culture systems and farmers practice. Fish ponds which had been in use were sampled. All the ponds were washed and filled with rainwater. They were freely stocked by the fish farmers at the period of the year (May – June, 2010) when the first set of post fingerlings were produced.

Table 2. Location for the Research and the Number of Stations Sampled

S/NO	Locations	Community	Sampled Station (No)
1.	Urban	Ekwulobia	5
2.	Semi-Urban	Amansea	5
3.	Rural	Umuoji	5

Post fingerlings of African catfish (Clarias gariepinus) were stocked by the fish farmers at various densities. Imported fish feed (Brand: Dizengof) formulated at 40% were given to the fish at 5 – 10% body weight. Sampling of the fish ponds was carried out for six months (May – October, 2010). No specific time was fixed for the sampling because the stations were located at relatively far distances. Statistical analyses were carried out according to the stations sampled. Locational data were subjected to analysis of variance at 5% significant level, while the comparative ones were subjected to correlation coefficient analysis.

Results

Table 3. Catfish Harvest After 6-Months Culture at Various Locations in Anambra State

Location of fish pond (Area)	Stocking density (no/m^3)		Total number stocked		Total number harvested	
	Range	**Mean**	**Range**	**Mean**	**Range**	**Mean**
Urban	5-10	5 (2.15)	300-200	1160 (404.04	280-1900	1050 (396.68)
Semi-Urban	6-15	9 (1.92)	500-1500	860 (207.96)	350-1480	782 (228.88)
Rural	10-200	56 (82.34)	200-300	1040 (566.34)	170-2850	966 (545.36)

- *Density range was obtained from the raw data*
- *Standard errors are in parenthesis.*

The stocking densities and number of fish harvested from various locations during the research are presented in Table 3. There was no relationship (r = 0.4) between the densities in urban and rural communities. Different densities were also recorded in the semi-urban community. The correlation coefficient for the stocking densities in urban and semi-urban communities was also negative (r = 0.5). The highest densities of 10-200 post fingerlings per cubic metre pond volume were obtained in the rural community. Least densities (5-10 post fingerlings) were recorded in the urban area. Mean densities and their standard errors ranged from lowest 5±2 post fingerlings in the urban to the highest 56±82 post fingerlings in the rural area. Fish harvest from the culture system were higher in the urban (mean 1050±0) than in other communities. The least number of fish (mean 782±29) was harvested from the system in semi-urban communities.

Table 4. Yield of Catfish After 6 – Month Culture at Various Locations in Anambra State

Location of fish pond (area)	Estimated weight range at stocking (g)	Weight at harvest (kg)	
		Range	Mean
Urban	3-7	1.3-2.0	1.56 (0.13)
Semi-urban	3-7	1.2-2.2	1.48 (0.26)
Rural	3-7	1.0-2.0	1.72 (0.20)

- *Standard errors are in parenthesis*

Fish production at various locations during the research revealed as Table 4. There was no significant difference ($P<0.05$) between yields from any two locations. The highest yield (mean 1.72±0.26kg) was obtained from the rural and the (mean 1.48±0.26) from the semi-urban. The rates of fish survival (table 5) were generally very significant ($P<0.05$). The survival rate was highest (93%) in the rural area. The least rate of survival (90.5%) was obtained from urban area.

Table 5. Survival Rate of Catfish After 6-Months Culture at Various Locations in Anambra State

Location of fish pond (area)	Mean Number Stocked	Mean Number harvested	Survival rate (%)
Urban	1160	1050	90.5 (9.5)
Semi-urban	860	782	91.0 (9.0)
Rural	1040	870	93.0 (7.0)

- $\text{Survival rate (\%)} = \frac{\text{mean number harvested}}{\text{Mean number stocked}} \times \frac{100}{1}$
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- *Mortality rates are in parenthesis.*

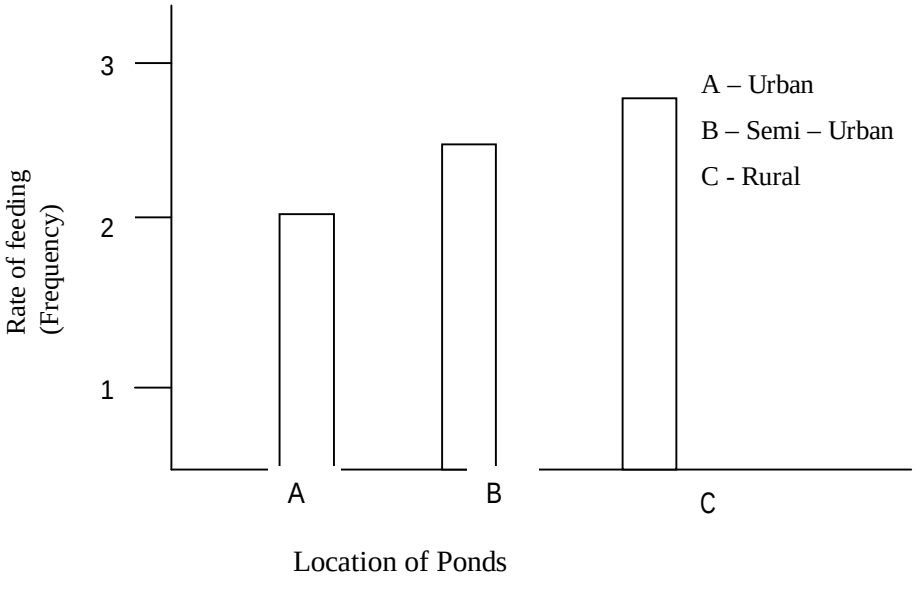

Fig 1 Mean Feeding Frequency at Various Locations During The Research

Feeding frequency at various locations is presented in Fig 1. There was no relationship (r = 0) between the rates of feeding in the urban and semi-urban areas. Correlation coefficient for feeding rates at urban and rural locations was also negative (r = o). However, the differences between means were not significant ($P<0.05$). Rate of feeding was highest in the rural (almost 3 times in a day) and lowest in the urban – 2 times in a day.

Discussion

Omoregie and Davies (1994) conducted research on growth responses and survival rates of fish fed with artificially formulated diets and recommended *Oreochromis niloticus* as conspicuous species of the fresh water fauna suited for pond culture. In semi intensive culture systems in the south eastern Nigeria (including Anambra) aquaculturists pay more attention to catfish than other fish species (Ezenwaji, 2002). In the present research, attention was also paid to catfish culture. More so, Clarias species is widely distributed, occurring in the Anambra River basin and contributing greatly to fish production (Ezenwaji, 2002). The survival rate of fish in the present research implies that optimum stocking densities are yet to be established. Minimum density of 20 fingerlings of catfish per cubic volume of pond water was recommended by Anambra State Agricultural Development Programme. Least density in the present research is

significantly lower than the given minimum. The significant survival rate could be the effect of genetic make-up and source of the fish seeds. High stocking densities in the rural area seem not to have negative effects on the rates of survival and fish production. Fish production in developing countries which derive food security through small-scale aquaculture production are not yet fully understood (Williams, 1996). Level of fish production in the rural area may indicate that high feeding frequency (Fig 1) has more positive effects than in urban and semi-urban areas.

The ability of catfish to eat virtually anything during culture, including supplementary feeds (Dilleton, 2002) may have resulted in very high fish in the rural area. Enormity of appetite for supplementary feeds and rate of feeding may be responsible for the higher fish production in the rural than in the urban and semi-urban areas. Fish farmers elsewhere are mainly interested in producing more fish for their families than sophisticated ponds or expensive equipments and still obtain good yield economically by encouraging the growth of algae (Denyoh, 2001). In the present research, fish culture system at various locations are very simple and in agreement with the observations of Denyoh (2001). Physio-chemical parameters were not considered in the present research as they were all determined by indigenous knowledge system (IKS), which was probably recommended by agricultural extension officer. Earlier, Ufodike and Garba (1994) observed that mortalities in tropical fish culture in ponds could be the consequence of hypoxia (lack of oxygen) resulting from high Biological Oxygen Demand (BOD). However, fish mortality was significantly low. Higher stocking densities with high rate of feeding as obtained during the research could enhance fish production. However, "middle of the way" density may further reduce fish mortality. More so, introduction of simple scientific equipment like probe in measuring pond – water parameters may give accurate data for better pond management and higher fish yield.

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