

## Concrete Pond Management Skills Required by out-of-School Youths for Sustainable Fish Farming in Akwa Ibom State

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### **Abstract**

*The study was designed to determine concrete pond management skills required by out-of-school youths for sustainable pond fish farming in Akwa Ibom State. Two research questions and two null hypotheses guided the study. The population of the study comprised of 360 respondents made up of two hundred and forty (240) agricultural extension agents and one hundred and twenty (120) fisheries lecturers in three (3) tertiary institutions in Akwa Ibom State. Simple random sampling technique was used to obtain fifty percent (50%) of the population sample of 180 respondents. Data was collected from respondents using face validated structured questionnaire. The result of the analysis revealed that out-of-school youths required skills in pond construction and maintenance management skills. It was recommended among others that out-of-school youths be trained on the identified concrete pond management skills for sustainable fish farming in Akwa Ibom State.*

**Keywords:** Concrete Pond, Skills, out-of-School Youths, Management, Fish Farming.

### **Introduction**

Pond fish farming is the technology of controlled raising and growing of fish in enclosed bodies of water known as pond. A pond facility can be constructed and demarcated using net within natural water bodies of spring, stream, rivers and lake at low water depth areas. A pond facility can also be successfully constructed on land. On the land, a variety of raw materials are available for construction of fish pond. These include, earth, plastics, concrete, bamboo, timber, tarpaulin, among others. However, farmers' choice of material in pond construction is usually influenced by factors such as, location, the available raw material, the purpose of farming, the scale of production, the financial power and the farmer's level of management skill acquired. In line with this, some of the pond facilities currently used for fish farming includes: earthen pond, plastic tank, wooden trough, cages, concrete pond, Gee-Pee tanks and netting for pond demarcations in natural water bodies, Omitoyin (2007) observed that, a pond facility constructed with the mixture of cement, sand and gravel in the ratio of 1:2:4 using fresh water as solution is known as concrete pond. A concrete pond can be constructed by erecting blocks, use of flat slaps or casting the mixture. The best form of constructing concrete pond is circular or rectangular shapes. However, irrespective of any design and form, the ultimate goal is to construct a durable solid enclosure capable of retaining and holding a large volume of water for a period of time for culturing fish.

Today according to Udoh (2012) the culturing of fish in concrete pond facility is now common among farmers, especially in the urban and semi-urban areas due to unavailability of sufficient land because of industrialization and housing. In addition, the farmers' choice of

concrete pond facility when compared to other facilities is as a result of the outstanding benefits farmers enjoy. Concrete pond does not require much land space. It can be constructed on any soil type, structure and topography, when skillfully designed and constructed to accommodate any topographical structure. It can be constructed within the living quarters. It is durable when constructed following recommended specifications. In addition to the construction benefits, culturing of fish in concrete pond permit high stocking density. It gives room to close observation and monitoring of fish activities. It makes provision for enhancing fish growth through feed supplementations. It reduces fish poaching. Concrete pond facility also creates employment opportunity to individual engaging in pond construction. The culturing of fish in concrete pond, gives employment opportunities of hatching fish egg for pond stocking as well as re-stocking of natural water bodies. It increases fish production and consumption towards promoting increase protein intake of man, especially in the developing countries like Nigeria, in which the protein intake is below the require 75g per person per day (Omitoyin, 2007).

The enticing benefits of culturing fish in concrete pond facility has motivated and encouraged the people of Akwa Ibom State into concrete pond fish farming. Coupled with the fact that Akwa Ibom is a maritime state with three major hydrographic features (Cross River, Qua Iboe River and Imo River), the aquatic environment support fish farming. The fresh, marine and brackish water ecosystem also provides a good number of culturable fish species (Essen, 2005). In Akwa Ibom State, according to Udoh (2012) concrete pond fish farming is found among the youths, civil servants, retirees, families, organizations, schools and even farmers. A greater number of the self-motivated individuals and youths who operate in concrete pond facility have little or no knowledge and skill practices required for sustainable concrete pond fish farming. It is the concern of this paper, therefore, to identify the concrete pond management skills required by out-of-school youths for sustainable fish farming and employment opportunities in Akwa Ibom State.

Out-of-school youths are school drop-outs or school leavers at all levels of education who for one reason or the other could not proceed for further studies. According to O'Higgins (1997), among the vast majority of unemployed people in Nigeria are out-of-school youths. This fraction of the population of any Nation needs to be trained to be gainfully engaged in productive vocational activities like fish farming, otherwise they may constitute a nuisance to other members of the society through involvement in anti-social activities like cultism, militancy, insurgency, fraud and armed robbery. In line with this observation, Ojo and Gagbenro (2008) affirmed that in Nigeria some tiers of government are empowering youths to go into fish farming for employment and income generation. Therefore in order to encourage sustainable fish farming among the youths in Akwa Ibom State, the acquisition of skills in pond management becomes imperative.

Management according to Ebong (2000) consist of interlocking functions of creating, organizing, planning, controlling and directing organizational resources in order to achieve set objectives. A fish famer, in this case is a manager that organizes, plans, directs and control

all the resources, knowledge and skill practices involved in sustainable fish farming. Udoh (2012) observed that the measurement of sustainability in concrete pond fish farming is in the acquisition of management skills and practices required such as site selection skills, construction management skills, pond preparation and pond maintenance skills.

Skill according to Udoh (2012) is the ability to learn, understand, interpret and apply wisdom to be manifested. Osinem (2008) also observed that skill is the practical proficiency displayed in the performance of a task. Ekong and Udoh (2014) equally opined that skill is an acquired knowledge translated into practical activity. Skill acquisition, according to Usoro (2016), is an ability to work productively. In the same line of thought Udoh (2012) opined that skill acquisition is the ability of an individual to demonstrate the habit of thinking, acting and performing within a particular task domain in such a way that the process becomes natural to the individual through practice. Hence, deducting from the understanding of skill and skill acquisition for productivity in a given task, it therefore implies that if out-of-school youths should acquire the prerequisite practical skill requirement in operating concrete pond facility, there is likely to be proficiency, expertise achievement, productivity and above all sustainability in fish farming for national development.

### **Statement of the Problem**

In Akwa Ibom State, it is observed that out-of-school youths farming in concrete pond are faced with problems of pond cracking, pond leakage, poor inlet-and outlet water drainage system and at the worst end, pond collapse. This is because they lack the basic management skills in concrete pond management. This usually results at untimely folding up and unsustainable fish farming for self-reliance. The paper, therefore, seek to identify concrete pond management skills required by out-of-school youths for sustainable fish farming.

### **Purpose of the Study**

The purpose of this study is to identify concrete pond management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State. Specifically the study sought to:

1. Determine concrete pond construction management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.
2. Determine concrete pond maintenance management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.

### **Research Questions**

The study answers the following research questions;

1. What are the concrete pond construction management skills required by out of school youths for sustainable fish farming in Akwa Ibom State.
2. What are the concrete pond maintenance management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.

### **Null Hypotheses**

The following null hypotheses were formulated and tested at .05 level of significance.

**Ho<sub>1</sub>:** There is no significant difference in the mean rating of agricultural extension agents and fisheries lectures on concrete pond construction management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.

**Ho<sub>2</sub>:** There is no significant difference in the mean rating of agricultural extension agents and fisheries lecturers on concrete pond maintenance management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.

**Methodology**

Survey design was used to identify skills required by out-of-school youths for sustainable fish in concrete pond facility. The population of the study which consisted of 380 respondents, comprised of two hundred and forty (240) agricultural extension agents and one hundred and twenty (120) fisheries lecturers, in University of Uyo, College of Education, Afaha Nsit, and Akwa Ibom State University, Ikot Akpaden, all in Akwa Ibom State. A fifty percent (50%) sample each of the 240 agriculture extension agents and the one hundred and twenty(120) fisheries lecturers were randomly selected giving a total of 180 respondents.

Data were collected through the use of researchers made questionnaire which contained 16 items and titled “Concrete Pond Management Skills Required by out-of-school youths for Sustainable Fish Farming Questionnaire” (CPMSROYQ). Face validation was done by fisheries lecturers in Fisheries Department, University of Uyo and Vocational Education Department (Agricultural Education) University of Uyo. The questionnaire had a 4-point rating scale of Very Greatly Required (VGR), Greatly Required (GR), Required (R) and Not Required (NR) with assigned scores of 4, 3, 2 and 1 respectively. Data were analysed using mean, standard deviation and t-test using the Statistical Package for Social Science (SPSS). For answering research questions, the benchmark required was 2.50. A mean of 2.50 and above were considered as required while below 2.50 were considered not required. The null hypotheses were rejected for items whose level of significance were less than or equal to .05. (i.e. P < .05). If otherwise they were upheld.

The real limits of assigned values of rating for decision on the level of out-of-school youths concrete pond construction and maintenance management skills required are shown below:

Rating Options	Assigned Values	Real Limit	Decision
Very greatly required	4	3.50-4.00	VGR
Greatly required	3	2.50-3.49	GR
Required	2	1.50-2.49	R
Not Required	1	0.5-1.49	NR

**Results**

**Research Question 1:** What are the concrete pond construction management skills required by out of school youths for sustainable fish farming in Akwa Ibom State.

Results of research question 1 are presented in

**Table 1: Concrete pond construction management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State. *n* = 180**

S/N	Concrete Pond Construction Management Skills	<i>M</i>	SD	Remark
1	Clearing and stumping of proposed site of all plants and vegetations.	3.50	.72	VGR
2	Employing of skilled professional in concrete pond construction.	3.78	.41	VGR
3	Using the recommended mixture of cement, sand and gravel in the ratio of 1:2:4 respectively	3.85	.35	VGR

4	Construction of at least 2-4 pond facilities at commencement to ease fish sorting	3.65	.47	VGR
5	Construction of ponds using a common embankment	3.68	.46	VGR
6	Casting of pond floor using concrete mixture	3.12	1.05	GR
7	Plastering of pond walls both in and out using one inch thickness	3.04	1.01	GR
8	Building of pond inner corners in circular forms	3.34	.63	GR
9	Reinforcement of pond wall by building of buttress outside the pond	3.30	.89	GR
10	Installing of pond-water inlet channels at the upper part of pond and outlet channel at the bottom.	3.67	.46	VGR
<b>GRAND TOTAL</b>		<b>3.49</b>		<b>VGR</b>

Source: Field study, 2017.

Results in Table 1 shows that all the items enumerated had grand mean of 3.49 and mean ratings of above 2.50. This reveals that out-of-school youths required the management skills for concrete pond construction.

**Research Question 2:** What are the concrete pond maintenance management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.

Results of research question 2 are presented on Table 2.

**Table 2: Concrete pond maintenance management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State. *n* = 180**

S/N	Concrete Pond Maintenance Management Skills		SD	Remark
1	Cleaning and washing of pond at the completion of every production cycle	3.54	.50	VGR
2	Filling pond with water at all times to prevent direct heat of sun that causes cracking	3.73	.44	VGR
3	Covering / shading of pond during dry seasons	3.72	.45	VGR
4	Not using sharp object to wash and scrub pond bottom and inner walls	3.10	1.04	GR
5	Avoiding using heavy object on pond	3.42	1.02	GR
6	Prompt repairs of pond cracking, leakage, collapse and all forms of damages	3.64	.70	VGR
<b>Grand Total</b>		<b>3.52</b>		<b>VGR</b>

Result in Table 2 shows that all the items had grand mean of 3.52 and mean rating of above 2.50. This shows that out-of-school youths required all the identified pond maintenance management skills for sustainable fish farming in Akwa Ibom State.

**Ho<sub>1</sub>:** There is no significant difference in the mean rating of agricultural extension agents and fisheries lectures on concrete pond construction management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.

Results of research hypothesis 1 are presented on Table 3.

**Table 3: t-test analysis for concrete pond construction management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.**

		Agents of the Fisheries Lecturers)				n <sub>1</sub> = 60; n <sub>2</sub> = 120			
S/N	Management Skills Required by Out-of-School Youths in the Construction of Concrete Pond	$\bar{X}_1$	SD <sub>1</sub>	$\bar{X}_2$	SD <sub>2</sub>	Df	t-cal	P	Remark
1	Clearing and stumping of proposed site of all plants and vegetations.	3.46	.73	3.51	.72	178	-.308	.759	NS
2	Employing of skilled professionals in concrete pond construction.	3.80	.40	3.78	.41	178	.181	.857	NS
3	Using the recommended mixture of cement, sand and gravel in the ratio of 1:2:4 respectively	3.80	.40	3.88	.32	178	-1.055	.294	NS
4	Construction of at least 2-4 pond facilities at commencement to ease fish sorting	3.66	.47	3.65	.48	178	.155	.877	NS
5	Construction of ponds using a common embankment	3.73	.44	3.66	.47	178	.638	.525	NS
6	Casting of pond floor using concrete mixture	3.26	1.01	3.05	1.08	178	.915	.363	NS
7	Plastering of pond wall, both in and out using 2.5cm thickness	3.06	1.01	3.03	1.02	178	.146	.884	NS
8	Building of pond inner corners in circular forms	3.33	.60	3.35	.65	178	-.116	.908	NS
9	Reinforcement of pond wall by building of buttress outside the pond	3.26	.78	3.31	.94	178	-.249	.804	NS
10	Installing of pond-water inlet channels at the upper part of pond and outlet channel at the bottom.	3.66	.47	3.68	.46	178	-.158	.875	NS
<b>TOTAL</b>		<b>3.50</b>		<b>3.49</b>		<b>178</b>	<b>-.184</b>	<b>.854</b>	<b>NS</b>

Data in Table 3 indicates that all the items in concrete pond construction management skills required by out-of-school youths had p-values greater than .05. Therefore, the null hypothesis (H<sub>01</sub>) that there is no significant difference in the mean rating of extension workers and fisheries lecturers on concrete pond construction management skills required by out-of-school youths was accepted. This implies that all the skills studied are needed by out-of-school youths for sustainable fish farming in Akwa Ibom State.

**H<sub>02</sub>:** There is no significant difference in the mean rating of agricultural extension agents and fisheries lecturers on concrete pond maintenance skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.

Results of research hypothesis 2 are presented on Table 4.

**Table 4: t-test analysis for concrete pond maintenance management skills required by out-of-school youths for sustainable fish farming in Akwa Ibom State.**

		$(\bar{x}_1 - \bar{x}_2) / \sqrt{\frac{SD_1^2}{n_1} + \frac{SD_2^2}{n_2}}$						$n_1 = 60; n_2 = 120$	
S/N	Management Skills Required by Out-of-School Youths in the Management of Concrete Pond	$\bar{x}_1$	$SD_1$	$\bar{x}_2$	$SD_2$	df	t-cal	P	Remark
1	Cleaning and washing of pond at the completion of every production cycle	3.60	.49	3.51	.50	178	.742	.460	NS
2	Filling pond with water at all times to prevent direct heat of sun that causes cracking	3.73	.44	3.73	.44	178	.000	1.000	NS
3	Covering / shading of pond during dry seasons	3.73	.44	3.71	.45	178	.165	.870	NS
4	Not using sharp object to wash and scrub pond bottom and inner walls	3.06	1.08	3.11	1.04	178	-	.833	NS
5	Avoiding using heavy object on pond	3.40	1.03	3.43	1.03	178	-	.886	NS
6	Prompt repairs of pond cracking, leakage, collapse and all forms of damages	3.66	.71	3.63	.71	178	.209	.835	NS
<b>TOTAL</b>		<b>3.53</b>	<b>3.52</b>	<b>178</b>	<b>082</b>	<b>.935</b>	<b>NS</b>		

Source: Field study, 2017.

Data in Table 4 indicates that all the items on pond maintenance management skills had p-values greater than .05. Therefore, the null hypothesis ( $H_0$ ) that there is no significance difference in the mean rating of agricultural extension agents and fisheries

lecturers on pond maintenance management skills required by out-of-school youths was accepted. This implies that the skills on concrete pond maintenance management are therefore critical for sustainable farming in Akwa Ibom State by out-of-school youths in an effort to keep them productively engaged.

### Discussion of Findings

The findings on out-of-school youths management skills required for the construction of concrete pond for sustainable farming in Akwa Ibom State shows that all the skills were needed by the out-of-school youths. The analysis of the result in Table 1 indicated that all the identified skills were required by out-of-school youths. The t-analysis in Table 3 indicated that there was significant difference in the mean response of agriculture extension agents and fisheries lecturers on management skills required by out-of-school youths in the construction of concrete pond for sustainable fish farming. The finding of the study is in line with the findings of Omitoyin (2007) which viewed that concrete pond should be constructed by experienced and skilled professionals and not by quacks. Accordingly, Udoh (2012) observed that two to four (2 – 4) pond facilities should be constructed at the start to facilitate fish sorting, using common embankment to fortify strength. The author further maintained that

pond bottom should be concretized, the inner corners should be built in circular forms to give fish smooth water environment and the pond walls plastered at least 2.5cm thickness while buttress should be built outside the pond walls to fortify the pond. The installation of water inlet and outlet channels to facilitate proper drainage management, are the management skills required by out-of-school youths for sustainable fish farming in concrete pond facility. The fact remain that if out-of-school youths are trained to acquire the basic skills in pond construction, the incidence of pond leakage, cracking, poor water drianage and collapse would be prevented in concrete pond fish farming.

The results in Table 2 showed that all the maintenance management skills are required by out-of-school youths. The t-test analysis on Table 4 also indicated that there is significant difference in the mean responses of agricultural extension agents and fisheries lecturers on maintenance management skills required by out-of-school youths. The finding of the study is in line with the finding of Okaeme (2011) which opined that out-of-school youths required acquisition of pond maintenance skills of impounding a clean water to cover the bottom and inner walls of pond at all times with or without fish, not hitting pond with heavy object, not using sharp object to scrub pond bottom and walls, cleaning and washing of pond after a production cycle, shading of pond during dry season and prompt response to repairs of pond crack, leakage and collapse are the maintenance management skills required by farmers for sustainable fish farming in concrete pond facility. This implies that out-of-school youths acquisition of the maintenance skill, would help to overcome problems associated with poor pond maintenance resulting in cracking, leakage, collapse and unsustainable fish farming in Akwa Ibom State.

### **Conclusion**

From the findings of the study, it could be concluded that out-of-school youths going into fish farming require the identified management skills in pond construction and maintenance being the benchmarks for productive and sustainable fish farming in concrete pond.

### **Recommendations**

From the study, the following recommendations were made:

1. Akwa Ibom Agricultural Development Programme through the agricultural extension agents should train out-of-school youths on identified pond construction and maintenance management skills for sustainable fish farming in Akwa Ibom State.
2. Fisheries lecturer's through fish farmers association should organize a training workshop for out-of-school youths on identified pond construction and maintenance skills for sustainable fish farming in Akwa Ibom State.
3. Out-of-school youths should always identify themselves with renowned registered fish farms to learn the required skills and management practices to establish and remain in concrete pond fish farming sustainably in Akwa Ibom State.

### **References**

Ebong, V. O. (2000).: *The Agribusiness Management in a Developing Economy : Nigeria Perspective*. Uyo, Dorand Publishers.



- Ekong, A. O. and Udoh, F. E. (2014). Fish Pond Water Management Practices and Students' Acquisition of Skills in Homestead Fish Farming. *Journal of Education, University of Uyo, Uyo* 7(1), 77-88.
- Essen, A. A. (2005). *The Basic of Successful Fish Farming in Coastal and Semi-Coastal Zones of Nigeria*. Uyo: Impact Ventures.
- O'Higgins, N. (1997). *The challenge of youth unemployment*. Geneva. ILO publishers.
- Ojo, S. O. & Gagbenro, O. A. (2008). *Empowering Youths to Fight Unemployment and Poverty through Effective Fish Farming Strategy in Nigeria*. <https://ir.library.oregonstate.edu/handle/>. Retrieved June 14, 2017.
- Okaeme, A. N. (2011). *Homestead Fish Pond and the Environment in Nigeria*. New Bussa, Niger State: National Institute for Freshwater Fisheries Research (NIFFR). [www.aguaticcommons.org/idprint/3731/](http://www.aguaticcommons.org/idprint/3731/) Accessed May 7, 2011.
- Omitoyin, B. O. (2007). *Introduction to Fish Farming in Nigeria*. Mushin, Lagos: Royal Bird Venture.
- Osinem, E. C. (2008). *Managing Agricultural Education and Training, Resource, Principles and Methods*. Enugu: Belony International Publishers.
- Udoh, F. E. (2012). Effect of Pond Culture Practices on Students' Acquisition of Skills in Homestead Fish Culture in Akwa Ibom State. An Unpublished Ph.D Thesis Submitted to the Department of Vocational Education, Faculty of Education, University of Uyo.
- Usoro, E. B. (2016). *Business Education Skills Acquisition and Development for Posterity: The 49<sup>th</sup> Inaugural Lecture Delivered at the University of Uyo, Uyo on June 30, 2016*. University of Uyo Press Ltd.