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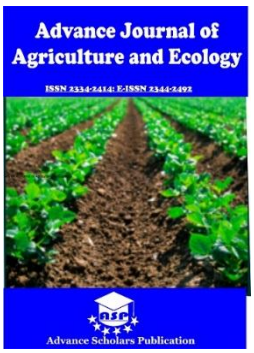

THE WORK-SKILLS REQUIRED FOR IMPROVING FISH FARMING IN ENUGU STATE

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Keywords:
Work-skills, improving fish farm.

Abstract:
Fish farming is an area of agricultural practices that involves a lot of planning. considerable investment in construction of ponds and management, hatching and breeding of fish seeds, fishing tools and fish processing, marketing, storage and utilization of cropping. The study examined the Work-Skills Required for Improving Fish Farming in Enugu State. Survey research design was used in study among 17 Local Government Areas. Questionnaire was used in data collection. The data collected was analyzed and presented on tables. The result of the study shows that that work-skills for improving hatching and brooding of fingerlings such as providing of good specie to brood. providing of specie with normal growth rate, identifying brooding stock by sex, providing of mature brood, putting the brooding stock anaesthetic to increase survival rate, identifying the fish according to specification and checking the eggs for characteristics of hatching, selling out the fingerlings. The result also shows that pond construction work- skills for improving pond management and harvesting which includes locating suitable pond site, clearing pond site, constructing water outlet at the deepest end of the pond, identifying appropriate fish feed, providing feed fish at the appropriate time and spot, checking the predator and controlling the weeds in pond before harvesting. It was concluded that work- skills for improving hatching and brooding of fingerlings under the following basic skills items such as providing of good specie to brood, providing of brooding specie with normal growth rate, identifying brooding stock by sex, providing of mature brood stock that can sawn, providing of screen in brooding ranks to safeguard against early brooding, putting the brooding stock anesthetic to increase survival rate, identifying the fish according to specification, artificially fertilize the eggs according to

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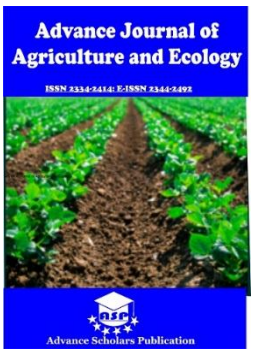

	specifications, putting the fertilized eggs in the incubator/ hatchery, putting the brood fish into ante tank with water, checking the eggs for characteristics of hatching aerating the larvae to keep them alive, putting the fry into rearing pond.

1.0 Introduction

Fish farming is an area of agricultural practices that involves a lot of planning. considerable investment in construction of ponds and management, hatching and breeding of fish seeds, fishing tools and fish processing, marketing, storage and utilization of cropping.

The term fish farming is quite different from the word fishery. Fish farming refers to engagement in a line of fish enterprise such as hatching and breeding, fish production and fish preservation and marketing. Fishery refers to the science and technology of fish production. It refers to a fish farm such a trout fishery. Fishery is a branch of agriculture, which refers to the business, or industry of catching fish. Fish farming is an aspect of fishery

Fish farming has some values that make the fish farmers to improve the work-skills in fish farming in many societies. It is a source of food that sustains the life of individuals. It is a source of employment to the farmer that helps him meet his basic needs of shelter, education for children, clothing and feeding the family. The money obtained an also be used for social activities such as obtaining chieftaincy titles, marriages, travelling and as gifts. Find also is a source of raw materials for industries, tourist attraction, recreational activities like the aquarium, source of research material, a source of foreign exchange and a commodity of export trade.

Obi (2001) stated that the need for fish arises from the need for protein i man's diet. Protein is required for the maintenance and growth of worn out cells. Fish is generally a high quality food. Fish protein contains all essential amino-acids and its protein content is inversely proportional to that of the fat.

Fish farming consists of breeding new fish stock. holding them in Captivity and feeding them. Modern fish culture technique': involves the Hatching and stocking of selected fish species which are fed to maturity with compounded diet Fish production in ponds was the beginning of man's effort to culture his desired species in a controlled environment. Fish production in ponds encompasses the various stages of stocking, taking care of and finally cropping (harvesting) of the fish when they reach maturity under controlled condition.

Further, Okorie (2009) stated that skill is anything an individual has learned to do with ease and precision which may be physical. mental, manipulative, fingering and eye co-ordination. Skill involves a physical demonstration of the ability o perform a given

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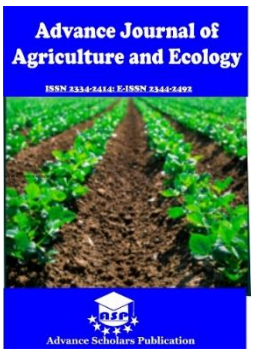

task successfully with a result that has pleasant value. There are two levels of skill, namely; they entry level skill and professional skill. Professional skills are those forms of proficient actions that prepare men and women for the practice of their professions.

Professional fishing skills are those abilities that prepare the individual to be able to take up and practice fish production. Professional skills can be in the form of work skills that enable individuals to carry out their jobs successfully.

Olaitan and 1gb) (2006) stated that work-skill involves practical activities which can help an individual to acquire saleable skill. They maintained that work-skills entailed a total array of responsibilities within an activity which an individual performs for work to have been done. This can be into module or regarded as works-skill mod riles.

Olaitan (2003) noted that a module is a unit of a curriculum. Entry level skill is for one who has the basic knowledge, skill and ability to perform a job like in fish farming occupation. Specifically, entry skills are those tasks, skills, attitudes, values and appreciation that are deemed fundamental for success in life and in earning a living.

According to Olaitan (2003), for fish farmers to improve in fish farming, they must have sufficient knowledge, skills strength and judgement, feeding of fish, disease and control, fish feed production, fish tools marketing and preservation, storage and utilization. Anybody who engages in all of these activities is a fish farmer. Therefore, fish farming is the engagement of a person in one or more of these activities.

The first stage in fish farming is fish hatching and breeding of fingerlings. Fish breeding is the act of spawning by a mature fish while fish hatching is the Production of fish seeds of desired fish species. Fish production is geared towards rearing of fish fingerlings to table size (grown-out stage), which is average of 500 grains. Sprawling is the act of laying eggs by gravid female fish. Gravidity is a state of female fish being filled with matured eggs.

Fish eggs are hunched in the hatchery into fish fry (larvae) and reared to fingerling's size by fish breeders. The fish hatchery is where the young fish is produced and it is an essential part of modern fish culture. It is suitable for organized propagation and rearing of several fish species jointly and sequentially. A fish fry is a less advanced stage f fish growth, usually after the growing fish has absorbed the yolk while fingerlings are an advanced stage of fish fry, usually used for stocking ponds. Fish seeds are the young fish are marked for planting into that' pond. A fry or a fingerling is fish seed once it is meant for stocking. Stocking is the introduction or the planting of the fish seeds into the designed and constructed hatchery for rearing.

Ajana (2001) stated that fishpond could be constructed in areas where the soil could hold water. the most important factor in fishpond

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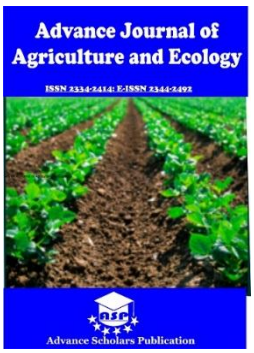

construction is the level of the pond relative to the water supply under gravity and discharge the used water under gravity. a well- constructed pond is easy to manage and facilitates humper fish harvest- Management practices include meeting all requirement for stocking with the desired fish species, care and maintenance of the water quality and quantity, procedural repairs of holding facility, feeding of the fish with the desired diets and harvesting of the fish using appropriate fishing gears.

In Nigeria fish production appears to be in the hands of men and women who could not meet the demand of individuals due to inadequate skills used in the production. Many states in Nigeria, like Enugu State, embarked on the importation was discovered at last to be seriously draining the nation's foreign exchange reserve and so was banned. In order to meet this great demand, skills acquisition centres were encouraged by the federal government in many states in the country, where people receive practical training and guidelines (acquire skills) in different work areas.

Njoku (1992) stated that skill acquisition centre is a place for offering artisan courses. An artisan is an unskilled workman. Skill acquisition centres did not last for long period and many fish farmers did not acquire the requisite work-skills for i proving fish farming. It is likely that the types agriculturists, the extension agents and commercial fish farmers constitute reasonable factors as regards their opinions on work-skills required for fish farming production in Enugu State. It is then becomes necessary to ascertain the opinions of the agriculturists vis-à-vis these variables. Fish farming is an essential aspect of animal agriculture and the need to develop people with the work-skills required paramount attention in Enugu State in particular. It is upon this background that the need arose to determine the Work-skills required improving fish farming in Enugu State.

1.3 Research hypothesis

There are three r search hypothesis in this research paper which include

- What are the work-skills required for improving hatching and brooding of fingerlings in Enugu State?
- What are the work-skills required for improving pond management and Harvesting in Enugu State?
- What are the work-skills required for improving in fish feeding in Enugu State.

2.0 Theoretical framework

A theory according to Olaia (2000) is a set of related statement that are arranged so as to give functional meaning to a set of series of events. He stresses that a theory could be defined as a systematic related group of statement inducing some laws, like generalizations that are empirically testable. In this sense, theory is a unifying statement, a universal preposition and predictive statement.

Beaucheam (2001) opined that a theory is a set of related statement which may take the form of

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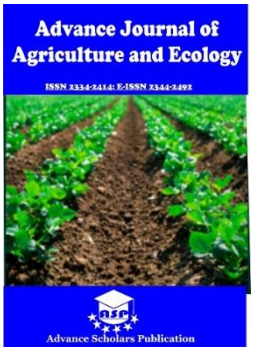

descriptions, operational constructs, assumptions, hypothesis, generalization, laws or theorems.

According to Homby (2001), it is a format set of ideas that is intended to explain why something happens or exist. The importance of a theoretical framework in any research work is to make the research problem manageable. In order words, theory provides a guide or criteria for diagnosing and analysing the research problem. Such analysis will help the researcher to draw inferences and conclusion about the problems raised in the course of his 'nork. It is believed, therefore, that all researches stem from some sort of theories; explicit and they are always Present to provide the needed base for a good empirical investigation.

2.1 Related Empirical Studies

Olaitan (2003) used the skill analysis technique to identify the Professional aspects of Agricultural Education where field teachers in Agriculture in Ondo State required improvement for effectiveness. He developed a professional competency based instrument containing 284 professional performance element organized into 56 clusters under 11 categories. The result showed that about 89% of all teachers of Agriculture in secondary Schools in the area indicated the needs for improvement about 99& the non- professional teachers with less than four years teaching experiences expressed highest professional improvement needed. He recommended development studies and in-services training of teachers of agricultural sciences. The present study equally relates to this study because it also seeks for work- skills required for improving on fish farming.

The government and agricultural extension workers will help to see that fish farmers are well equipped with skills required in fish farming operations. As the professional teachers need skills for improving in the teaching, also the fish farmers need the skills for improving on fish production.

Oyewusi (2006 conducted a study on workshop management Competencies needed by Introductory Technology teachers in Ogun State. Survey design was used in carrying out the study. The population comprised 254 teachers of Introductory Technology in Ogun State. The instrument used for data collection was a questionnaire. A total of 34 competences were identified. Mean, standard deviation, t-test and analysis of variance were used for analysis of data obtained. The result showed that 241 out of 254 teachers did not possess adequate competencies to manage Introductory Technology workshops. The recommendation was that all the 34 competency needed for school workshop management by the teachers should be included in the in- service training curriculum for the introductory teachers. This study is related to present study because they are both concerned with work-skills required for improving on their learning and also the fish farmers required work-skills for improving on fish farming.

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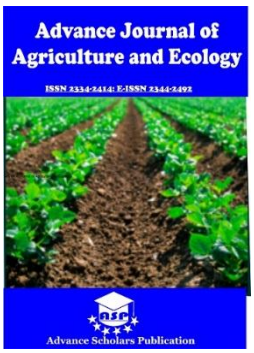

King and Miller (1998) identified the competences secondary vocational agricultural education teachers must possess in order to plan and implement program successfully. That study was related to the present study because it was about work-skills required for improving agricultural education. The fish farmers required work- skills for improving in fish farming. When they were improved in their work-skills fish farmers would have bumper harvest.

Dumbiri (2005) conducted research on work-skills required by secondary school graduates for employment in fish enterprise in Delta State. He developed three research questions for the study and formulated three null hypotheses that were tested at 0.05 level of significance. He made use of structured questionnaire to collect data from 105 respondents on work-skills required in fish breeding enterprise and fish processing and marketing enterprises. Mean and standard deviation, were used to analyse data for answering the research questions and the t-test null hypothesis at 0.05 level of significance. He found that 102 of respondents agreed that they required work-skill for improving in fish farming while 3 of the respondents do not agree that they required work-skill.

It was revealed that there was no significant difference in the mean ratings of the responses of respondents on the work-skills required by secondary schools graduates for employment in fish enterprises, indicating that professional job experiences and responsibility of the respondents did not significantly influence the opinions

On work- skill items. The study was related to the present study because they were both concerned with work- skills required for entry into occupations. Since the secondary school graduates needed all the skills required for improving in fish enterprise's, it follows that the fish farmers needed work skills for improving in fish farming.

2.2 Summary of Literature Review

Related literature on work-skills required for improving fish farming was review with the view of identifying the work-skills for improving fish farming. The review covered the major areas of fish farming such as fish hatching and Brooding, pond management and harvesting, fish feeding.

It was observed that through literature abounded on work-skills required for improving in fish farming. As a result, there is a knowledge gap, which must be filled for reasons such as providing knowledge required in fish farming functional and for gainful employment of youths in fish farming production. Again, to identify and develop fish farming skills required for successful fish farming in Enugu State and in Nigeria, it is necessary to make use of knowledge and ideas of experts in fish hatching and brooding of fingerlings, pond management and harvesting, fish feeding. It was observed that though literature abounded on work-skills on various areas of education little or even nothing has been done on work-skills required for

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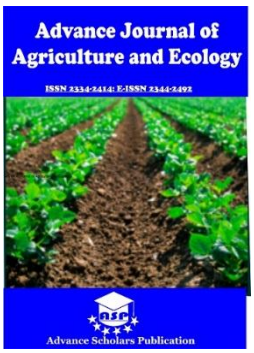

improving in fish farming. As a result, there is a knowledge gap, which must be filled for reasons such as providing knowledge required in fish farming functorial and gainful employment of youths in fish farming functional and for gainful employment of youths in fish farming production. Again, to identify and develop fish farming skills required for successful fish farming in Enugu State and in Nigeria, it is necessary to make use of knowledge and ideas of experts in fish hatching and brooding of fingerlings, pond management and harvesting and fish feeding.

The literature revealed that fish farming occupies important position in the sector of agricultural food production. Its growth could be maintained by encouraging small-scale production by every Nigeria family. Moreover, the related literature and the relevant skills revealed that in spite of this, the fish farmer still needed different strategies, approaches and modes for improving fish production. Therefore, this study wills identity the work skills required for improving fish farming in Enugu State since reviewed literature did not address this area.

3.0 Research method

This section dealt with the description of the procedures used in conducting the study. The section covered the design of the study, area of the study, population for the study, instrument for data collection, validation of the instrument, reliability of the instrument, method of data collection and method of data analysis.

3.1 Research Design

The survey research design was used. Osuala (2001) and Ezeah (2004) opined that the survey design is one in which a group of people is studied by collecting and analysing data from a few people which are representative of the entire group using questionnaire and interviews. Olaitan and Ngwoke (1999) stated that survey research is an outline or plan in which the entire population or representative sample is studied by collection and analysing data from the group through the use of questionnaire. The data collected were used to answer research questions. The survey design was considered suitable because the instrument was dichotomously scored .

3.2 Area of the study

The study was carried out in Enugu State. Enugu State was made up of 17 Local Government Areas. For administrative purposes the state was divided into six agricultural zones, namely:

• Enugu zone — which consists of Enugu East, Enugu North, Enugu South and Isi-Uzo Local Government Areas.

• Nsukka Zone — Nsukka, Igbo Etiti, UzoUwani Local Government Areas.

• Enugu E:ike Zone — IgboezeNorth, Igboeze South and Udenu Local Government Areas.

• Agbani zone Nkanu-East and Nkanu West Local Government Areas.

• Oji-Rive zone — Aninri, Awgu Local Government Areas.

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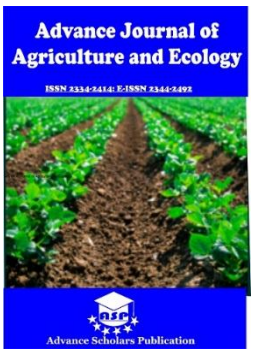

• Udi zone — Udi and Ezeagu Local Government Areas. (ENADEP, 2012). The State Agricultural Development Programme (ADP), the agency responsible for extension, was equally organized in accordance with the six zones. (Statistics Dept ENADEP, 2012).

3.3 Method of Data Collection

The researcher administered and collected the copies of the questionnaire with the help of three research assistants. Each of the research assistants covered one agricultural zone while the researcher covered the remaining three agricultural zones.

The researcher trained them on the administration of the questionnaire to the respondents. The trained research assistants helped in retrieving the completed questionnaire from the respondents within one week.

3.4 Method of I ala Analysis

The data coiled d from the study were analysed using the mean with standard deviation for answering the research questions. The values attached to the response options of the question were 4, 3, 2, 1 signifying very highly required, highly required, moderately required and rarely required respectively.

Decision rule: I or answering the research questions the decision rule was based on the values of lower and upper limits of n can, thus:

Very highly required	3.50 — 4.00
Highly required	2.50 — 3.49
Moderately required	1.50—2.49
Rarely required	0.50— 1.49

The decision null for the null hypothesis (H0) was; where the calculated t-test value of any item was greater than the value of t- table value at the appropriate degree of freedom, the null hypothesis (H0) was rejected, whereas when the value of the t-calculated of any item was less than the table t- value, the null hypothesis was not rejected.

4.0 Data Analyses and Results

This chapter is concerned with the analysis of data and presentation of results. The results are presented in tables according to the research questions and hypotheses.

Research question 1: What are the work-skills required for improving hatching and brooding of fingerlings?

The data for answering research question 1 were presented in Table 4. 1.

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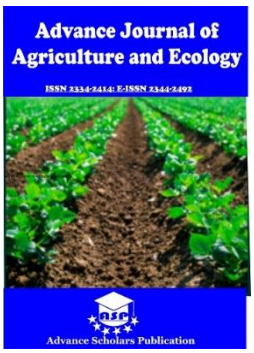

Table 4. 1: Mei ratings of the respondents on work-skills required for improving hatching and brooding of fingerlings

S/N	Items	RR	MR	HR	VHR	X	SD	Remark
1	Providing of good species to brood required	1	5	15	161	3.85	0.46	Very highly brood required
2	Providing of brooding species with normal growth rate	3	3	23	153	3.79	0.64	Very highly brood required
3	Identifying brooding stock by sex	3	9	61	109	3.62	0.67	Very highly brood required
4	Providing of mature brood stock that can spawn	4	6	50	120	3.57	0.68	Very highly brood required
5	Providing of screen in brooding ranks to safeguard against early brooding	1	20	51	110	3.48	0.71	Highly required
6	Putting the brooding stock anaesthetic to increase survival rate	4	10	46	122	3.57	0.69	Very highly required
7	Identifying the fish according to specification	6	15	43	118	3.50	0.78	Very highly required
8	Artificially fertilize the eggs according to specification	9	11	53	109	3.44	0.81	Very highly required
9	Putting the fertilized eggs in the incubator / hatchery	9	18	42	113	3.42	0.86	highly required
10	Putting the brood fish into ante tank with water	3	23	52	104	3.41	0.77	Highly required

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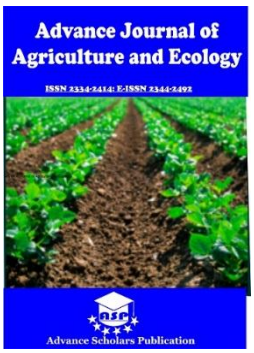

11	Checking the eggs for characteristics of hatching	3	15	51	113	3.51	0.71	Highly required
12	Acerating the larva to keep them alive	4	20	46	112	3.46	0.77	Highly required
13	Putting the fry into rearing pond	13	11	54	104	3.37	0.88	Highly required
14	Finding out the cost of fingerlings at the market	9	14	53	106	3.41	0.83	Highly required
15	Selling out the fingerings according to the maturity	5	15	43	119	3.52	0.76	Highly record books required
16	Recording them on suite grand mean	10	15	52	115	3.44	0.86	Very highly required

Table 4.1 shows that work-skills for improving hatching and brooding of fingerlings such as providing of good specie to brood. providing of specie with normal growth rate, identifying brooding stock by sex, providing of mature brood t, ck that can spawn, putting the brooding stock anaesthetic to increase survival rate, identifying the fish according to specification and checking the eggs for characteristics of hatching, selling out the fingerlings according to the maturity were rated as very highly required by 161, 153, 109, 120, 122, 118, 113 and 119 respondent respectively, highly required by 15, 23, 61, 50, 46, 43, 51 and 43 respondents respectively, moderately required by 5, 3, 9, 8, 10, 15, 15, and 15 respondents respectively and rarely required by 1, 3, 3, 4, 4, 6, 3 and 5 respondents respectively. Very highly means values of and 3.85, 3.79, 3.52, 3.57, 3.57, 3.50, 3.51 and 3.52 indicate that the work-skills are very highly required for improving hatching and brooding of fingerlings. Providing of screen in brooding ranks to safeguard against early brooding. artificially fertilize the eggs according to specification, putting the fertilized eggs in incubator/hatchery, putting the brood fish into ante tank with water, Ae; 1ng the larvae to keep them alive, putting the fry into rearing pond, finding out the cost of fingerlings at market and recording them on sale record books were rated as very highly required by 110, 109, 113, 104. L2, 104, 106 and 115 respondents respectively, highly required by 20, 11, 18, 23, 20, 11, 14 and

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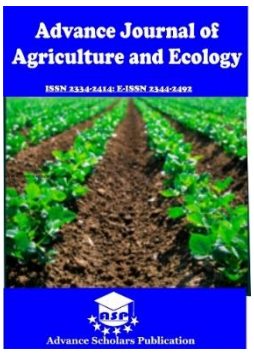

15 respondent sportively and rarely required by 1, 9, 9, 3, 4, 13, 9 and 10 respondents respectively. Highly mean response values of 3.48, 3.44, 3.42, 3.41, 3.46, 3.37, 3.41 and 3.44 indicate that the work-skills are highly required for improving hatching and brooding of fingerlings. The grand mean of 3.51 indicates that the items in responses on work-skills required for improving hatching and brooding of fingerlings are very highly required. The standard deviation are far from the mean that showed that the responses are normally distributed.

Research question 2: What are the work-skills required for improving pond management and harvesting in Enugu state?

The data for answering research question 2 were presented in Table 4. 2

Table 4.2: Mean ratings of the respondents on work-skills required for improving pond management and harvesting.

S/N	Items	RR	MR	HR	VHR	X	Sd	Remark
1	Locating suitable pond	3	6	23	150	3.76	0.59	Very highly brood required
2	Surveying the land to be used for the pond	1	20	53	108	3.47	0.76	Highly required
3	Clearing the pond site	7	9	46	120	3.53	0.76	Very highly required
4	Determining suitable pond size	8	11	52	111	3.46	0.79	Highly required
5	Determining suitable pond shape	8	11	52	111	3.46	0.79	Highly required
6	Excavating the pond bottom	4	21	54	103	3.40	0.77	Highly required
7	Determining suitable pond depth	8	13	54	107	3.43	0.80	Highly required
8	Building the draining system	12	15	49	106	3.37	0.89	Highly required

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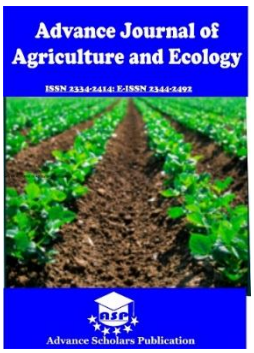

9	Constructing water inlet to the pond at shallowest end	3	15	69	95	3.41	0.71	Highly required
10	Putting big stones where incoming water can splash	4	26	53	99	3.36	0.80	Highly required
11	Constructing water outlet at the deepest end of the pond	5	14	48	115	3.50	0.75	Very highly required
12	Grassing the pond	11	20	41	110	3.37	0.90	Highly required
13	Providing the pond some shade by planting shrubs on the pond	8	15	64	95	3.35	0.81	Highly required
14	Introducing water in the pond	11	15	39	117	3.44	0.88	Highly required
15	Testing the pH of water	11	13	35	123	3.48	0.87	Highly required
16	Applying fertilizers to the pond water	14	12	52	104	3.35	0/90	Highly required
17	Identifying appropriate fish feed	6	15	39	122	3.52	0.78	Very highly required
18	Feeding fish regularly	11	15	41	115	3.43	0.88	Highly required
19	Providing feed fish at the appropriate time and spot	3	16	52	112	3.50	0.71	Very highly required
20	Finding out when fish is hungry	6	16	60	100	3.40	0.78	Highly required
21	Providing the right quantity of organic	5	19	53	105	3.42	0.78	Very highly required
22	Checking the predator and control	4	12	54	112	3.51	0.71	Very highly required

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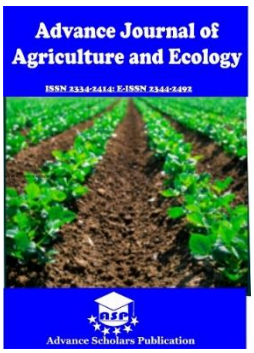

23	Adding supplements to fish feed	10	15	32	133	3.60	0.86	Very highly required
24	Controlling the weeds in pond before harvesting	5	12	32	133	3.60	0.73	Very highly required
25	Removing anti patching device in pond before harvesting	4	17	48	113	3.48	0.75	Highly required
26	Stopping feeding fish in the pond 2-3 before harvesting	10	18	47	107	3.38	0.87	Highly required
27	Harvesting fish early in the morning	8	22	44	108	3.38	0.86	Highly required
28	Providing close meshed drag net to harvest in nursery pond	11	16	42	113	3.41	0.88	Highly required
29	Using seine net 1 cm for complete harvesting	9	20	54	99	3.34	0.86	Highly required
30	Using cast net to deep part of pond and pulls slowly towards the shallow end	6	21	45	110	3.42	0.82	Highly required
31	Grand mean					3.45	0.73	Highly required

Table 4.2 shows that pond construction work-skills for improving pond management and harvesting which includes locating suitable pond site, clearing pond site, constructing water outlet at the deepest end of the pond, identifying appropriate fish feed, providing feed fish at the appropriate time and spot, checking the predator and controlling the weeds in pond before harvesting were rated as very highly required by 150, 120, 115, 122, 112 and 133 respondent respectively, highly required by 23, 46, 48, 39, 52, 54 and 32 respondents respectively, moderately req ed by 6, 9, 14, 15, 15, 12 and 12 respondents respectively and rarely required by 3, 7, 5, 6, 3, 4 and 5 respondent respectively. Very highly mean values of 3.76, 3.53, 3.50, 3.52, 3.50, 3.51 and 3.60 indicate that the work-skill are very highly required for improving pond management and harvesting, surveying the land to be used for the pond, determining suitable pond size, excavating the pond bottom, determining suitable pond depth, building the drainage

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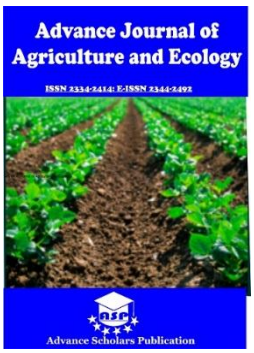

system, constructing the water inlet to the pond at the shallowest end, putting big stone where incoming water can splash, grassing the pond, providing the pond some shade by planting shrubs on the id and introducing water in the pond where rated as very highly required by 108, 117, 111, 103, 107, 106. b. 99, 110, 95 and 117 respondents respectively, highly required by 53, 45, 52, 54, 54, 49, 69, 53, 41, 64 and b respondents respectively, moderately required by 20, 12, 11, 21, 13, 15, 15, 26, 20, 15 and 15 respondents respectively and rarely required by 1, 8, 8, 4, 8, 12, 3, 4, 11, 8 and 11 respondents respectively. Highly mean values of 3.47, 3.49, 3.46, 3.40, 3,43, 3.37, 3.41, 3.36, 3.37, 3.5 and 3.44 indicate that the work skills are high required. Testing the pH of water, applying fertilizer to the pond, feeding fish regularly, finding out when the Ii is hungry and providing the right quantity of organic were rated as very highly required by 123, 104, 1 15. 0 and 105, highly required by 35, 52, 41, 60 and 53, moderately required by 13, 12, 15, 16 and 19, rarely required by Il. 14, 11, 6 and 5. High mean response values of 3.48, 3.35, 3.43, 3.40 and 3.42 confirmed that the work-skills are highly required. Adding supplements to fish feed, removing anti-poaching device in pond before harvesting, harvesting fish early in the morning, providing close meshed drag net to harvest in nuts pond, using seine net f 1cm for complete harvesting and using cast net to deep part of pond and pulls slowly towards the shallow end were also rated very highly required by 110, 113, 107, 108, 113, 99 and 110 respondents Lots respectively, highly required by 47, 8, 47, 44, 42, 54 and 45 respondents respectively, moderately FCL ed by 15. 17, 18, 22, 16, 20, and 21 respondents respectively and rarely required by 10, 4, 10, 8,11,9 and 6 respondents respectively. The mean values of 3.41, 3.48, 3.38, 3.38, 3.41, 3.34 and 3.42 indicate that the work-s his are highly required. The grand mean of 3.45 indicates that the items in response on work-skills required for improving pond management and harvesting are highly required. The standard deviations are far from the means that showed that the responses are normally distributed.

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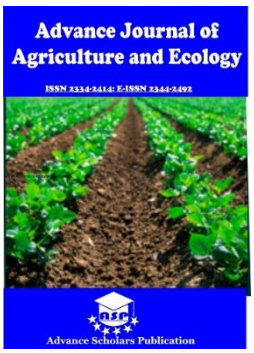

Research Question 3: What are the work-skills required for improving in fish feeding in Enugu state
The data for answering research question 3 were presented in table 4.3
Table 4.3 : mean rating as of the respondents on work skills required for improving fish feeding

s/n	Items (pond construction)	RR	MR	HR	VHR	X	SD	Remark
1	Identifying appropriate fish feed	2	4	20	156	3.81	0.51	Very Highly required
2	Identifying feed used in feeding fingerings and matured fish	2	7	54	119	3.59	0.62	Very Highly required
3	Applying fertilizers to the pond	13	15	36	118	3.42	0.91	Highly required
4	Checking the pond daily in the morning	4	12	47	119	3.43	0.71	Highly required
5	Checking for leaks	10	11	53	108	3.48	0.83	Highly required
6	Cleaning filters regularly	10	16	41	115	3.54	0.86	Very Highly required
7	Enriching pond with appropriate feeding staff	8	14	42	118	3.43	0.81	Highly required
8	Adding fresh water to the pond to maintain normal oxygen level	1	22	37	122	3.50	0.72	Very Highly required
9	Feeding the fish with the amount of feed needed	7	16	50	109	3.39	0.80	Highly required
10	Feeding fish regularly	6	13	47	116	3.54	0.77	Very Highly required
11	Feeding fish at the appropriate time and spot	11	16	46	109	3.46	0.88	Highly required
12	Identifying the right quantity of organic matter into the pond	5	9	51	117	3.46	0.71	Highly required

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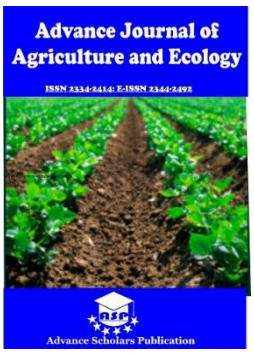

13	Providing the fish with balance diet	5	18	48	111	3.55	0.78	Very Highly required
14	Checking when the fish is hungry	6	14	52	110	3.48	0.77	Highly required
15	Adding supplementing to fish feed	5	9	49	115	3.48	0.71	Highly required
16	Identifying the right quantity of organic matter into the pond	1	14	64	103	3.61	0.66	Very Highly required
17	Checking the fish health	8	17	36	121	3.50	0.83	Very Highly required
	Grand Mean					**3.51**	**0.72**	**Very Highly required**

Table 4.3 shows that work-skills for improving fish feeding such as identifying appropriate fish feed, identifying I sed in feeding fingerlings and matured fish, applying fertilizer to the pond and checking the pond daily in the morning were rated as very highly required by 156, 119, 118 and 119 respondents respectively highly required by 20, 54, 36 and 47 respondents respectively moderately required by, 7, 15 and 12 respondents respectively and rarely required by 2, 2, 13, and 4 respondents respectively. Very high mean of 3.81 and 3.59 indicate that the work-skills ae very highly required for improving fish feeding and the mean value of 3.42 and 3.43 indicate that the work-skills are highly required. Checking for leaks, cleaning filters regularly, enriching the pond with appropriate feeding stuff and adding fresh water to the pond to maintained were rated as very highly required by 108, 115, 118 and 122 respondents respectively, 52. 41, 42 and 37 respondents respectively, moderately required by 11, 16, 14 and 22 actively, rarely required by 10, 10, 8 and 1 respondents respectively. Very high mean response 3.50 indicate that the work-skills are very highly required, and 3.48 and 3.43 indicate that the work- skills are highly required. Feeding fish with the amount of fish needed, feeding fish regularly, feeding fish lime and spot, and identifying the right quantity of organic matter into the pond were rated as red by 109,

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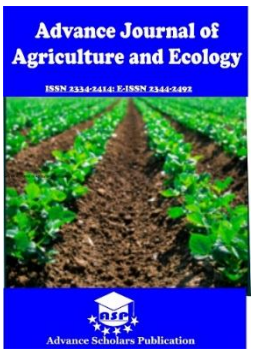

116, 109 and 117 respondents respectively, highly required by 50, 47, 46 and 51 actively, moderately required by 16, 13, 16 and 9 respondents respectively and rarely required respondents respectively. Very high mean response values of 3.54 indicate that the work-skills are very highly required for improving fish feeding and 3.39, 3.46 and 3.46 indicate that the work-skills are highly required. Providing the fish with balance diet, checking when the fish is hungry, adding supplements to fish feed, identifying the right quantity of organic matter into the pond, checking fish health and feeding in the as very highly required by 111, 110, 115, 103 and 121 respondents respectively, highly 52, 49. 64 and 36 respondents respectively, moderately required by 18, 14, 9, 14 and 17 respondents respectively and rarely required by 5, 6, 5, 1 and 8 respondents respectively. Very high mean 3.55. 3.61 and 3.50 indicate that the work-skills are very highly required for improving fish feeding, and the mean values of 3.48 and 3.48 indicates that the work-skills are highly required. The grand mean of 3.5 I: indicate that the items in responses on work-skills required for improving on feeding of fish are very highly required . The standard deviations are far from the mean that showed that the responses are normally distributed.

5.0 Discussion of findings

Regarding research question one which dwelt on hatching and brooding of fingerlings, it was found out that the respondents agreed that the work- skills for improving hatching and brooding of fingerlings under the following basic skills items such as providing of good specie to brood, providing of brooding specie with normal growth rate, identifying brooding stock by sex, providing of mature brood stock that can sawn, providing of screen in brooding ranks to safeguard against early brooding, putting the brooding stock anesthetic to increase survival rate, identifying the fish according to specification , artificially fertilize the eggs according to specifications, putting the fertilized eggs in the incubator/ hatchery, putting the brood fish into ante tank with water, checking the eggs for characteristics of hatching aerating the larvae to keep them alive, putting the fry into rearing pond, finding out the cost of fingerlings at the market and selling out the fingerlings according to the maturity were required for improving hatching and brooding of fingerlings.

This finding agreed with Obi)2002) who described planning as a decision on what to be done and strategies to accomplish it. These might include goal setting selection of suitable location, arranging for regular supplies. Selection of appropriate production facilities and identification of customers or market as some aspects of planning required for profitability . the result on breeding and hatching conforms to a study concluded by Okeke (1992) who identified ability to fertilize eggs. Rearing of larva and 34 other skills as required skills in improving fish farming.

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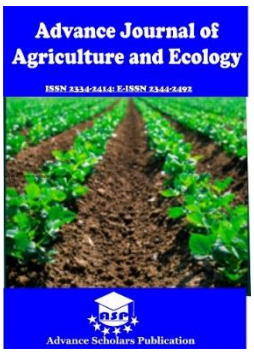

On research question two which dwelt on pond management and harvesting, the findings revealed that the following work-skill items such as locating suitable pond site, surveying the land to be used for the pond, clearing the pond site, determining suitable pond side, determining suitable pond shape, excavating the pond bottom, determining the suitable pond depth, building the drainage system constructing the water inlet to the pond at the shallowest end, putting big stone where incoming water can splash, constructing water outlet at the deepest end of the pond, grassing the pond.

Again the following items included: Providing the pond some shade by planting shrubs on the pond, introducing water in the : testing the pH of water, applying fertilizer to the pond, identifying appropriate fish feed feeding fish regularly, providing feed fish at the appropriate **time and spot,** finding out when fish is hungry, providing the right quantity of organic, checking the predator and control, adding supplements to fish feed, controlling the weeds in pond before harvesting, removing anti-poaching device in pond before harvesting, stopping feeding in the pond 2-3 before harvesting were required for improving pond management and harvesting.

The finding on pond construction was in consonance with the opinion of Ita (1994), who stated that a major prerequisite in fish rearing is the choice of a suitable site for pond construction. He said that apart from concrete, all earthen pond must be well sited on suitable soil to guard against excess water. the finding on management skill was also in line with Chakroff (1999) who stated that fish pond and the fish in them must be taken care of every day, He further stated that the best to care for fish is early in the morning as fishes are more likely to have problem this time. Also the finding on harvesting skill is in agreement with Kumar (1992), who stated that in nursery pond, harvesting should be done by seining the pond water using a close meshed drag net.

With respect to the research question three which discussed fish feeding, the result revealed that the following Work- skill item such as identify appropriate fish feed, identifying feed used in feeding fingerlings and matured fish, applying fertilizer to the pond, checking the pond daily in the morning checking for leaks, cleaning filters regularly , enriching the pond with appropriate feeding stuff, adding fresh water to pond to maintain normal oxygen level, feeding fish with the amount of feed needed, feeding fish regularly, feeding fish at the appropriate time and spot, identifying the right quantity of organic matter into the pond, providing the fish balance diet, checking when the fish is hungry, checking the fish health and feeding in the pond were required for improving fish feeding.

This finding was in line with Kummar (1992), who stated that the objective of feeding fish is to provide the nutritional requirements for good health optimum growth, optimum yield and minimum waste within reasonable cost so as to

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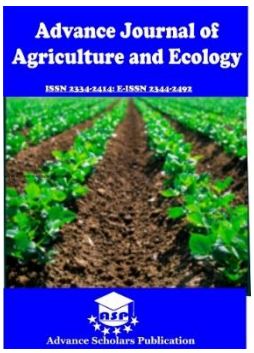

optimize profits. He further stated that every farmer should be particular about the quality of feed fed to the fish because it is the feed that determines the nutrients loading in the pond, fish growth rate and health states of the fish

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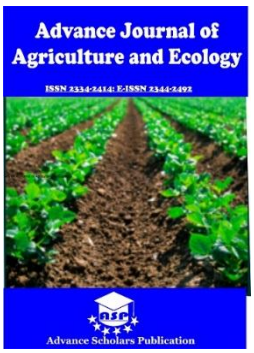

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