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COMPARATIVE ANALYSES OF SOCIO-ECONOMIC CHARACTERISTICS OF NIGERIAN AGRICULTURAL INSURANCE CORPORATION (NAIC) PARTICIPANTS AND NON-PARTICIPANTS FISH FARMERS IN OGUN STATE, NIGERIA

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ABSTRACT

Insurance services play crucial role in ensuring the continuity of agricultural businesses in Nigeria. This study compared the production characteristics of fish farmers participating in NAIC and the non-participants in Ogun State. The specific objectives were to describe the socio-economic and production characteristics of NAIC participant and non-participant fish farmers, identify the mode of insurance adopted, identify the constraints facing NAIC participants, and identify the problems facing fish farming in Ogun State. Multistage sampling procedure was used to sample 89 fish farmers who were participants and non-participants of NAIC from five purposively selected fishing communities because NAIC has been found to be active in those communities. Data were collected with two different interview guides for NAIC participants and non-participant fish farmers. Analysis was done using descriptive statistics. Results indicated that the mean ages were 47.36±8.36 years and 41.25±5.64 years for NAIC participants and non-participants respectively. About 63.3% and 28.6% of the NAIC participants operated at medium and small scales of production respectively while equal proportion (47.5%) of the non-participants of NAIC operated at medium and small scales of production. Majority (91.8% and 95.0%) of the NAIC participants and non-participants were practicing monoculture respectively. The highest proportions of the NAIC participant fish farmers considered delay in indemnity payment (49.0%), and rigorous procedures in claim settlement (42.9%) as very serious constraints to insuring fish farms. Chi-square revealed that category of fish farmers has significant associations (at $p<0.05$) with mode of land acquisition ($\chi^2 = 5.461$, df = 2) and sources of water used in fish farming. *It was concluded that NAIC has the potential to reduce the problems facing fish farmers in their day to day production activities.*

Keywords: Aquaculture insurance; Clariasgariepinus; indemnity payment; NAIC

INTRODUCTION

The demand for fish in Nigeria mostly outstrips the local production. Nigeria is the largest fish consumer in Africa and among the largest fish consumers in the world (Ozigbo *et al.*, 2014) with over 3.2 million metric tonnes of fish consumed annually (The Embassy of the Kingdom of Netherlands, 2019). Nigeria used to be the largest African aquaculture producer. According to Food and Agriculture Organization (FAO) (2012) report, Egypt became the highest producer of aquaculture in 2010 with 919,585 tonnes of total Africa production followed by Nigeria with 200,535 tonnes while in 2011, the total outputs were

986 820 tonnes and 221 128 tonnes for Egypt and Nigeria respectively (FAO, 2014). According to recent statistics cited by Adeleke *et al*. (2020), Egypt remains the largest producer of fish with production output of 1,561,457 metric tonnes which accounts for 71.10% of the regional share while Nigeria which is the second largest fish producer could only produce 291,233 metric tonnes contributing 13.26% of the regional share.

Aquaculture is the farming of aquatic organisms and plants in fresh, brackish or salt water (Olaoye *et al*., 2014). A wide variety of aquatic organisms are produced through aquaculture including fishes, crustaceans, molluscs, algae, and aquatic plants. Unlike capture fisheries, aquaculture requires deliberate human intervention in the organisms' productivity which results in yields that exceed those from the natural environment alone. Such interventions are stocking water with seed (fingerlings), fertilizing the water, feeding the organisms, and maintaining water quality (Ejiola and Yinka, 2012). Although aquaculture activities in Nigeria started more than six decades ago, the country has not been able to meet fish demand of the populace which is about 2.7 million metric tonnes annually with her domestic production (FBNQuest Research, 2016). This has led to importation of fish and fish products as only about 30% of the fish demand is met domestically resulting in an annual fish importation expenses of ₦125 billion annually (FBNQuest Research, 2016). Ozigbo *et al*. (2013) also reported that Nigeria imports over 900,000 metric tons of fish while its domestic catch is estimated at 450,000 metric tons/year.

Several factors have been responsible for the country's inability to bridge the widening gap between fish demand and domestic fish production. Some of these factors are production and post-harvest related. For instance, Eleri *et al*. (2012) noted that Nigerian farmers are increasingly faced with risk factors such as droughts, floods, diseases, pests, windstorms, accidents, fire, theft, damage and several other unplanned events whose occurrence cannot be readily predicted and therefore, poses serious threat to the success of fish farming enterprise. Patrick (2010) then opined that since farmers cannot predict the probability of occurrence of these unforeseen events and cannot bear the risks and uncertainties alone, they are faced with the option of transferring or sharing the risks involved in the day-to-day management of their farms with one or more individuals or firms. Agricultural insurance policy is one of the notable methods by which farmers can share or transfer the risks and uncertainties associated with their farming enterprises as it encourages them to make greater investment in agricultural production, promotes their confidence in venturing into adoption of new and improved farming practices, enhances their accessibility to credit from financial institutions by serving as an added collateral and ultimately provides financial support to farmers in the form of indemnity which ensures continuity of their farming enterprise.

Agricultural insurance is designed to provide covers for financial losses incurred due to reduction in expected outputs from agricultural products. The agricultural

insurance products include crops, livestock, fisheries and forestry (Atlas Magazine, 2020). The term "aquaculture insurance" describes all the various types of insurance that would normally be used to protect an aquaculture business operation. For a reasonably large aquaculture company, this would include insurance protection for buildings and equipment, employees, stock, livestock, liabilities, motor vehicles, vessels and divers, odds in transit, and other insurable interests.

Farmers are not willing to take an insurance cover; and when one considers the very low incomes, the small sizes of holdings aimed at subsistence production, ignorance, poverty and the adverse view of other people's experiences with activities of insurance companies in other sectors; peasant farmers are generally reluctant to patronize the insurance market, let alone willingly forgo a small payment in the form of premiums in exchange for their farm risks (Oyinbo *et al.*, 2013). In view of the risks and uncertainties of agricultural production in Nigeria, the federal government of Nigeria launched the Nigerian Agricultural Insurance Scheme (NAIS) on the 15th December, 1987 with main aim of protecting farmers from devastating effects of natural disasters such as flood, drought, fire, etc. and to ensure the payment of appropriate compensation sufficient to keep the farmers in business after suffering a loss (Aina and Omonona, 2012). Despite the existence of insurance services from Nigerian Agricultural Insurance Corporation (NAIC) and other private firms in Nigeria, there has been a low level of participation in insurance activities by farmers and in view of this, there is the need to examine the production characteristics of fish farmers participating in the services of Nigerian Agricultural Insurance Corporation (NAIC) and those that are not participating.

In recognition of the relevance of aquaculture insurance in the industry, previous studies such as (Akinrinola and Okunola, 2014; Taiwo *et al.*, 2019) have examined the impacts of insurance products on the productivity (in terms of income, and fish output). However, there is inadequate information on the differences that might occur in the socio-economic and production characteristics of the fish famers that benefitted and those that do not benefit from insurance schemes. In this regard, this study has contributed to the body of knowledge by comparing the production characteristics of fish farmers participating in the services of NAIC and the non-participants in Ogun State. The specific objectives of the study were to describe the socio-economic characteristics of the NAIC participants and non-participant fish farmers, describe the fish production characteristics of both categories of fish farmers, identify the mode of insurance adopted by the NAIC participant fish farmers, identify the constraints facing NAIC participant fish farmers in insuring their farms, and identify the general problems facing fish farming in Ogun State. To reach a sound conclusion, a hypothesis was tested on the relationship between production characteristics and category of respondents (NAIC participant and non-participant) at 5% level of significance.

METHODOLOGY

The study was conducted in Ogun State, southwestern Nigeria, among fish farmers

who were beneficiaries and non-beneficiaries of NAIC services. Fish farmers were selected through the multistage sampling procedure. Stage one involved the purposive sampling of five (Iperu, Iyana Ilogbo, Akute and Ikenne) fishing communities where NAIC has been found to be active within the State. A list of fish farmers in each of the selected communities was compiled by the research team with the help of extension personnel covering the communities. As shown in Table 1, a total of 167 fish farmers were compiled from the five fishing communities. About 60 percent of the fish farmers were then selected from the list obtained in each fishing community in Stage two. Stage 3 entailed the location of the fish farmers and obtaining their consent as only respondents who were willing and ready to respond to the content of the research instruments were finally interviewed for this study. A total of eighty-nine fish farmers served as the sample size in this study. The respondents were then categorized into NAIC participant (49) fish farmers and non-participant (40) fish farmers. Data were collected with the aid of two different interview guides – one for NAIC participant fish farmers and the other for the non-participant fish farmers.

TABLE 1: SELECTION OF RESPONDENTS FROM EACH OF THE FISH FARMING COMMUNITIES

Fishing Communities	Number of fish farmers as compiled (sampling frame)	Number of sampled fish farmers (60%)	Number of useful responses
Iperu	30	18	17
Iyana	32	19	17
Ilogbo	30	18	15
Akute	37	22	19
Ikenne	38	23	21
Total	**167**	**100**	**89**

Data were analyzed primarily by descriptive (frequency counts, percentages, means and standard deviation), and inferential (Chi-square and student-t test) statistics. Mode of land acquisition (inheritance, lease/rent or purchase), actual number of ponds owned and functioning, culture methods practiced (polyculture or monoculture), source of fish seeds (from hatchery or personal farm), types of fish raised (exotic, indigenous or both), and sources of water (borehole, well, river or reservoir) were used as proxies in measuring the production characteristics of the fish farmers. Four-point Likert-type scales with responses of Very Serious, Serious, Moderately Serious and Not Serious with scores of 4, 3, 2 and 1 respectively were used in determining the constraints faced in NAIC. Items with mean scores of at least 2.5 ((4+3+2+1)/4) were considered as being serious constraints to NAIC participant fish farmers. The general problems facing fish farming was measured on a three-point Likert type scale of Very serious, Serious and Not

Serious problems with scores of 3, 2 and 1 respectively. The cut-off point in this case was 1.50. Hence, items with mean score of less than 1.5 were not considered as being serious constraints to fish farming.

RESULTS AND DISUSSION

Socio-economic characteristics of the respondents

Results in Table 2 show that 28.6, 44.9 and 8.2 % of the NAIC participant fish farmers were in the age groups of 31 – 40, 41 – 50 and 21 – 30 years respectively while 37.5, 37.5 and 17.5 % of the non-participants were in the age groups of 31 – 40, 41 – 50 and 21 – 30 years respectively. This indicated that majority of the sampled fish farmers in Ogun State were still very young within 21 and 60 years. Although the mean ages indicated that NAIC participants (47.36±8.36 years) were older than the non-participants (41.25±5.64 years), all the fish farmers were within the working population of the State. This portends better and brighter future for fish production in the State as people between 15 and 64 years are considered to constitute the economically active population in Nigeria (National Bureau of Statistics - NBS, 2018).

Majority (85.7 and 90.0%) of the NAIC participants and non-participants were male. This implies that fish farming in the State was dominated by male folks thereby justifying the findings of Brummett *et al*. (2010) who reported that fishery activities are mostly dominated by men. According to Olaoye (2010), sex plays a very important role in fish farming and agriculture. Also, 89.8 and 72.5 % of the NAIC participants and non-participants were married respectively. This could imply that marriage is a highly cherished and valued institution in Ogun State especially among fish farmers. Ekong (2010) has also pointed out that marriage is highly cherished in our society.

It was found from Table 2 that majority of the NAIC (85.7%) participants and non-participant fish farmers (95.0%) had formal education. Although, more non-participant fish farmers were more educated than the NAIC participant fish farmers in terms of formal education, the NAIC participants had higher level of education with up to half possessing the tertiary education qualification. The higher level of education attained by the NAIC participant might be responsible for their participation in fish farm insurance scheme introduced by NAIC. This is so because fish farming requires a lot of technical and scientific knowledge to be successfully undertaken.

All (100.0%) of the NAIC participants and 60.0 % of the non-participant fish farmers were members of cooperative societies, implying that the importance of cooperative societies in promoting small and medium enterprises is increasingly gaining recognition by all. Cooperative society involves a social participant that helps farmers to pool their resources, have access to fisheries input and have insights in their fishing issues (Olaoye, 2010). Membership of cooperative is therefore a factor which could influence the adoption of modern techniques and ideas for guiding against risks and uncertainties associated with fish farming. Scholars (such as Stutzman *et al*. (2017), FAO (2016)) have highlighted the beneficial roles of groups such as fish farmers' associations and cooperative societies to include influencing policy and regulations, providing technical services,

facilitating access to market, aiding aquaculture research programmes, and providing member farmers with credit. With regards to family type, almost equal proportion (89.8 and 87.5%) of the NAIC and non-NAIC fish farmers belonged to the nuclear type of family while 10.2 and 12.5 % were members of extended families.

TABLE 2: SOCIOECONOMIC CHARACTERISTICS OF THE NAIC PARTICIPANTS (N = 49) AND NON-PARTICIPANTS (N = 40) FISH FARMERS

Socio-economic variables	Categories	NAIC participants		Non-participant farmers	
		Frequency	%	Frequency	%
Age (years)	21-30	4	8.2	7	17.5
	31-40	14	28.6	15	37.5
	41-50	22	44.9	15	37.5
	51-60	9	18.4	3	7.5
	Mean	**47.36±8.36 years**		**41.25±5.64 years**	
Sex	Male	42	85.7	36	90.0
	Female	7	14.3	4	10.0
Marital status	Married	44	89.8	29	72.5
	Single	5	10.2	8	20.0
	Widowed	0	0.0	3	7.5
Educational attainment	No formal education	7	14.3	2	5.0
	Primary education	5	10.2	8	20.0
	Secondary education	9	18.4	16	40.0
	Tertiary education	28	57.1	14	35.0
Membership of cooperative societies	Members	49	100.0	24	60.0
	Non-members	0	0.0	16	40.0
Family type	Nuclear?	44	89.8	35	87.5
	Extended	5	10.2	5	12.5

% is the symbol for percentage
Source: Field survey (2019)

Fish production characteristics

As shown in Table 3, 34.7 and 40.8 % of the NAIC participants acquired their productive lands through lease/rent and purchase respectively while 52.5 and 37.5 % of the non-participant fish farmers also acquired lands through lease/rent and purchase respectively. Also, close to one-quarter (24.5%) and one-tenth (10.0%) of the participants and non-participants of NAIC acquired lands through inheritance respectively.

In terms of ownership of fish ponds, 85.7 and 14.3 % of the NAIC fish farmers owned at

most 10 ponds and more than 10 ponds respectively while all (100.0%) of the non-NAIC fish farmers had at most 10 ponds. The mean ponds owned were 8±4 ponds and 6±2 ponds for participants and non-participants of NAIC respectively. More than half (51.0% and 52.5%) of the NAIC and non-NAIC fish farmers respectively had 1-5 functioning ponds. The mean number of functioning ponds was 6±1 ponds and 6±2 ponds for NAIC participants and non-participant fish farmers respectively. Majority (91.8 and 95.0%) of the NAIC and non-NAIC fish farmers were practicing monoculture respectively. Almost the same proportion (79.6 and 80.0%) of the NAIC participants and non-participant fish farmers sourced fish seeds from private fish hatcheries while 20.4 and 20.0 % raised fish seeds on their farms. Majority (83.7 and 77.5%) of the NAIC participants and non-participant fish farmers raised both exotic and indigenous types of fish respectively while exotic breeds were exclusively raised by 16.3 and 17.5 % of the participants and non-participants respectively. More than half (57.5%) of the non-participant fish farmers and 24.5 % of the NAIC participant fish farmers sourced water from borehole. More than one-third (36.7% and 34.7%) of the NAIC participants sourced water for fish production from well and river sources. River was a source of water to more than one-quarter (27.5%) of the non-participant fish farmers.

The implication is that in terms of fish production variables, both categories of the fish farmers seem to be similar in certain production variables such as culture methods practiced, source of fish seeds, and type of fish raised. They however differ in terms of number of fish ponds owned and functioning, and water sources. The research finding is an indication that NAIC participants owned higher number of ponds than do the non-participants. This agrees with Tiamiyu *et al*. (2015) who reported that participants of Fadama project II operated higher number of ponds than the non-participants; an indication that government programmes have significantly positive effect on aquaculture development.

The higher number of fish ponds owned (and functioning) by the NAIC participants could be attributed to their ability to guard against certain risks and uncertainties that could limit their operation. This is in line with the findings of Akinrinola and Okunola (2014) who found that insured farmers observed an increment in their investment levels and farm size after insuring their farms.

Fish farmers in the study area preferred monoculture to polyculture. This could be linked to the fact that it may be easier to manage monocultured fish farms than polycultured fish farms. This is supported by the report of Ali *et al.* (2017) that fish grown under monoculture system attain marketable sizes earlier than fish raised under the polyculture system. Based on the type of species cultured, *Clarias gariepinus* (Catfish) was cultured by majority of the NAIC participants and non-participants fish farmers in the study area. Tiamiyu *et al.* (2015) also reported that fish farmers in Lagos state mostly cultured *Clarias gariepinus.* This is due to higher market price, greater demand preferences, hardiness of the stock, faster growth, higher feed conversion ratio and higher survival rate under captivity associated with Catfish production.

Private fish hatchery serves as the source of fish seeds to majority of both the NAIC participants and non-participants fish farmers and this could imply that fish farmers lack the technical skills involved in raising fish seeds. It also reveals that a lot of money is usually expended on purchasing fish seeds which could lead to increased cost of production. Ability of fish farmers to raise their fish seeds on their own farms will reduce the cost of production, hence, the need for fish farmers in the study area to acquire more skills and needed information to be able to operate their personal fish hatchery.

TABLE 3: FISH PRODUCTION CHARACTERISTICS OF NAIC PARTICIPANTS (N = 49) AND NON-PARTICIPANTS (N = 40) FISH FARMERS

Fish production variables	Categories	NAIC farmers		Non-Participants	
		Frequency	%	Frequency	%
Mode of land acquisition	Inherited	11	24.5	4	10.0
	Lease/rent	17	34.7	21	52.5
	Purchase	21	40.8	15	37.5
Number of ponds owned	≤10	42	85.7	40	100.0
	>10	7	14.3	0	0.0
	Mean		**8±4**		**6±2**
Number of functioning ponds	1-5	25	51.0	21	52.5
	6-10	24	49.0	19	47.5
	Mean		**6±1**		**6±2**
Culture method practiced	Monoculture	45	91.8	38	95.0
	Polyculture	4	8.2	2	5.0
Source of fish seeds	Fish hatchery	39	79.6	32	80.0
	Personal farm	10	20.4	8	20.0
Type of fish raised	Exotic	8	16.3	7	17.5
	Indigenous	0	0.0	2	5.0
	Both	41	83.7	31	77.5
Sources of water used	Borehole	12	24.5	23	57.5
	Well	18	36.7	5	12.5
	Reservoir	2	4.1	1	2.5
	River	17	34.7	11	27.5

% means percentage

Source: Field survey (2019)

Mode of insuring fish farms

Figure 1 reveals that majority (87.8%) of the NAIC fish farmers insured their fish farms as individuals while 12.2 % insured theirs in groups as members of fish farmers' associations and/or cooperative societies. It could then be deduced that preference was given to individual farm insurance rather than insuring one's farm as a group. This could be attributed to the fact that agriculture is a risky enterprise that its insurance policy may not allow insuring farms in groups.

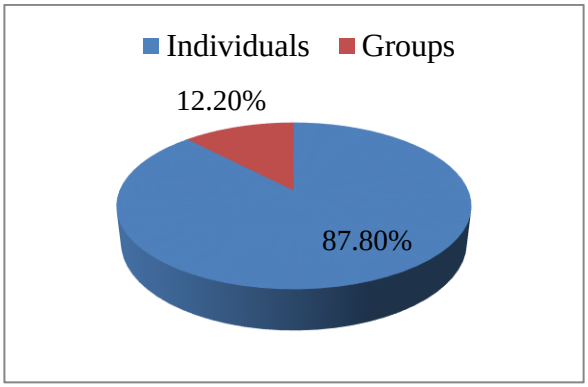

Figure 1: Mode of insuring fish farms

Source: Field survey (2019)

Constraints faced by NAIC participants in insuring their farms

The constraints faced by fish farmers during their engagement with the Nigerian Agricultural Insurance Corporation (NAIC) are presented in Table 4. Considering a mean cut-off point of 2.50, Table 3 reveals that the most severe constraints facing NAIC participant fish farmers was delay in indemnity payment which ranked first with a weighted mean score of 3.42±1.03. This was followed by rigorous procedure in claim settlement and delay in assessment of losses which ranked as second and third most severe constraints respectively to NAIC participants. Also, inaccessibility to insurance personnel with weighted mean score of 3.42±1.03 was among the severe constraints facing NAIC participant fish farmers in Ogun State. On the other hand, inadequate information dissemination and high premium paid were not considered as severe constraints by NAIC participants.

Delay in loss assessment could be linked to the inadequate infrastructure and support services such as poor feeder roads and lack of effective communication facilities.

TABLE 4: CONSTRAINTS FACED BY NAIC PARTICIPANT FISH FARMERS (N = 49)

s/n	Constraints	VS	S	MS	NS	Mean	SD	Ranking
1	Delay in indemnity payment	24 (49.0)	2 (4.1)	4 (8.2)	19 (38.8)	3.42	1.03	1st
2	Rigorous procedures in claim settlement	21 (42.9)	5 (10.2)	3 (6.1)	20 (40.8)	3.24	1.13	2nd
3	Delay in assessment of losses	18 (36.7)	2 (4.1)	4 (8.2)	19 (38.2)	2.97	1.27	3rd
4	Inaccessibility to insurance personnel	12 (24.5)	2 (4.1)	16 (32.7)	19 (38.8)	2.60	1.12	4th
5	Inadequate information dissemination	11 (22.4)	2 (4.1)	7 (14.3)	29 (59.2)	2.29	1.31	5th
6	High premium paid	0 (0.0)	1 (2.0)	16 (32.7)	32 (65.3)	1.53	0.56	6th

VS = very serious, S = serious, MS = moderately serious, NS = not serious and SD = Standard deviation; figures in parentheses are expressed in percentages

Source: Field survey (2019)

General problems encountered on fish farms by both NAIC participants and non-participants

Problems encountered by NAIC participants and non-participant fish farmers were presented in Table 5. The ranked mean scores revealed that destructions caused by flood and insufficient finances were ranked first and second respectively in terms of severity for both NAIC participant and non-participant fish farmers. For the NAIC participants, high cost and poor quality of feed (mean = 1.63) ranked third while it ranked fourth by the non-participants. With mean score of 1.70, insufficient extension visits/contacts ranked third amongst the problems confronting non-participant fish farmers. With cut-off point of 1.50, other items in Table 5 were not considered as posing serious problems to NAIC participant fish farmers while low production (mean = 1.50) was an additional problem confronted by non-participant fish farmers.

Generally, both NAIC participants and non-participants considered destruction caused by flooding as a serious problem encountered on fish farms. In addition, the non-participants considered insufficient finance as a serious problem on their farms. It could be implied from this finding that the NAIC participants have been able to cope with the challenge of insufficient funding of production activities as a result of fish farm insurance which covers the certain costs caused by risks and uncertainties.

TABLE 5: GENERAL PROBLEMS ENCOUNTERED ON FISH FARMS

Problems	NAIC participant fish farmers (n = 49)		Non-participant fish farmers (n = 40)	
	Mean	Ranking	Mean	Ranking
Destruction caused by flood	2.41	1st	2.50	1st
Insufficient finance	1.65	2nd	2.10	2nd
High cost and poor quality of feed	1.63	3rd	1.53	4th
Poor infrastructure	1.45	4th	1.33	8th
Poor management techniques	1.37	5th	1.48	6th
High cost and poor quality fish seed	1.33	6th	1.33	8th
Insufficient extension agent visits/contact	1.29	7th	1.70	3rd
Low production	1.22	8th	1.50	5th
Killing of fish by predators	1.10	9th	1.13	11th
Theft/pilfering	1.06	10th	1.38	7th
Disease outbreak	1.04	11th	1.23	10th

Items with mean scores ⩾ cut-off point (1.50) are serious problems while those with mean scores <1.50 were not seen as posing serious problems to fish farmers.
Source: Field survey (2019)

Relationship between production characteristics and category of fish farmers

Results presented in Table 6 reveal that category of fish farmers has significant associations (at $p<0.05$) with mode of land acquisition ($\chi 2 = 5.461$, df = 2) and sources of water used in fish farming. This could imply that while the NAIC fish farmers could acquire land for fish production through lease or rent, some of the non-participants could not as a result of lack of affordability of leasing a land.

TABLE 6: TEST OF ASSOCIATION BETWEEN SELECTED PRODUCTION VARIABLES AND CATEGORY OF FISH FARMERS

Production variables	Chi-square value	Degree of freedom	p-value
Mode of land acquisition	5.461	2	0.026*
Culture method practiced	1.756	1	0.241
Sources of fish seeds	0.555	1	0.618
Types of fish raised	1.382	2	0.183
Sources of water used	7.101	3	0.011*

Result from student-t test statistic in Table 7 indicated that there was no significant difference in the number of ponds owned and functioning by the NAIC participant fish farmers and the non-participants.

TABLE 7: TEST OF DIFFERENCE IN THE NUMBER OF FISH PONDS OWNED AND FUNCTIONING BY NAIC PARTICIPANTS AND NON-PARTICIPANTS

	Category of fish farmers	Mean	Standard deviation	Mean difference	t-value	p-value
Number of fish ponds owned	NAIC participants	8	4	2	1.235	0.052
	Non-participants	6	2			
Number of functioning fish ponds	NAIC participants	6	1	0	0.892	0.673
	Non-participants	6	2			

CONCLUSION AND RECOMMENDATIONS

It could be summarized that while NAIC participants and non-participant fish farmers were similar with respect to certain production variables such as source of fish seeds, culture method practiced, type of fish raised, and ownership of ponds, they differ with regards to mode of land acquisition, and source of water used. Participation in NAIC was affected by delay in payment of indemnity, rigorous procedures in claim settlement, delay in loss assessment, and inaccessibility to insurance personnel. Destruction caused by flooding was a serious constraint common to both NAIC participants and the non-participants while insufficient finance was an additional problem encountered by non-participant fish farms.

It is therefore concluded that NAIC has the potential to reduce the problems facing fish farmers in their day to day production activities and this could lead to increased productivity of fish farms in terms of increasing number of functioning ponds. It is therefore recommended that fish farmers should participate more effectively in NAIC services to insure their farms against losses caused by unexpected losses. The management of NAIC should also improve their services through prompt loss assessment and indemnity payment. The procedures of claim settlement should be less rigorous and fish farmers' access to insurance personnel should be enhanced.

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