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Effective Implementation of Fishery Policies for Food Security in Bayelsa State, Nigeria

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Abstract

The paper explored the effective implementation of fishery policies for food security in Bayelsa State, Nigeria. Three specific objectives, three research questions and three null hypotheses guided the study. The study adopted the descriptive survey design. The target population for the study were all the 242 agricultural science teachers in all the public secondary schools in the study area. Since the targeted population of 242 was manageable, it was therefore adopted as the sample of the study. Hence, the census sampling technique was used. The instrument used for data collection was a 25-item questionnaire, structured on a 4-point scale. The instrument was face-validated by three professionals in agricultural education from the Department Agricultural Science Education, Faculty of Education, Niger Delta University, Wilberforce Island, Bayelsa State. The reliability was determined using Cronbach Alpha statistical tool and a reliability index of 0.83 was obtained. Out of the 242 copies of the questionnaire that were administered to the respondents, 226 were retrieved; representing a 93.5% retrieval rate; which were used for the analysis. Mean was applied to analyse the data, and the t-test was employed to compute the null hypotheses at 0.05 level of significance. The study identified six (6) fisheries policies and their objectives, eleven (11) problems of policy implementation and eight (8) measures for effective implementation of fisheries policies. There was no significant difference in the mean ratings of the responses of male and female agricultural science teachers on the measures for effective implementation of fisheries policies in Bayelsa State. The study recommended among others, that grants, incentives, farm inputs, subsidies and loans should be given to farmers to enhance food security in the nation.

Keywords: Bayelsa State, Effective Implementation, Fishery Policy, Food Security, Nigeria.

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INTRODUCTION

The need for protein food increases proportionally with the increase in world population. Fish protein plays crucial roles in human diet such as development of the brain cells, repair of worn-out tissues, synthesis of muscles, tissues, enzymes and hormones, healthy growth and source of energy. The demand for protein is high in the tropical areas of the world wherein lies most of the developing countries like Nigeria (Moses, 2019).

According to the author, there are two primary sources of protein—plants and animals. However, several critical protein acids—notably methionine, tryptophan, and lysine—that are required for normal development, are lacking in plant proteins. On the other hand, animal protein, which comes from fish, cattle, and wild creatures (bush meat), is considered to be of greater importance as it is abundant in these amino acids.

In Nigeria, especially Bayelsa State, proteins obtained from bush meat and livestock are generally expensive, probably due to; high cost of inputs, the herculean task of hunting for wild

animals and the low level of technology, reduced grazing areas, poor management and pests/diseases problems. It was on this premise that Moses (2019) advised Nigerians particularly farmers, to depend on fish because it is cheap source of first-class animal proteins for the people of Bayelsa State. Hence, Suwari (2018) corroborate that fish has higher quality proteins, less unsaturated acids and quality fats soluble vitamins.

Tremendous natural resources abound in the Niger Delta region (Bayelsa State), including vast reserves of gas and crude oil, vast forests, productive farmland, and plentiful fisheries (Ike & Jemimah, 2016). Bayelsa State is a State in the Southern part of Nigeria. It was created in 1st October, 1996 out of Rivers State by General Sani Abacha. The State is predominantly Ijaws, with the Ijaw language being widely spoken throughout the State. It is the smallest in Nigeria by population. As of 2024, Bayelsa State has an estimated population of approximately 3,724,225, making it the least populous state in Nigeria (Wikipedia, 2025). Being in the Niger Delta Region, Bayelsa State has a riverine and estuarine setting, with bodies of water within the State, preventing the development of significant road infrastructure. As a state in the oil-rich Niger Delta, Bayelsa State's economy is dominated by the petroleum industry. It has one of the largest crude oil and natural deposits in Nigeria. The State is made up of eight Local Government Areas, viz; Brass, Ekeremor, Kolokuma/Opokuma, Nembe, Ogbia, Sagbama, Southern Ijaw and Yenagoa. The main livelihood activities of the people include artisanal fishing and agriculture because of the extensive coastlines in the area (Suwari, 2010).

Artisanal fisheries are the method of hunting and catching fish and related organisms with simple fishing gears around streams, creeks, rivers with canoes (Moses, 2019). Recent indications, yet, have shown a general depletion in fisheries resources due mainly to over fishing, water pollution, poor harvesting methods and destruction of natural habitats (Otobo, 2010; Njoku, 2011; & Nweze, 2012). According to Nweze (2012), other limitations to the expansion of capture fishery subsector in the study area include: incessant cases of sea piracy and maiming, high cost of fishing inputs, accessories and spare parts, water weeds, federal sea law (320km Exclusive Economic Zones) and the quest for white collar jobs especially in the oil companies. Other related problems of fisheries developments in the Niger Delta regions according to Otobo (2010) includes the following:

(a) reduced number of fisherfolk;
(b) non definition of goals and programmes;
(c) lack of continuity and commitment to policies; and
(d) non implementation of fisheries policies.

It was on this ground that Moses (2019) corroborated that poor timing in implementing, political opposition during implementation and compromises during policy implementation were responsible for poor development of fisheries sector.

The adverse effects of these constraints have drastically reduced the fishing population, hence gross inadequacy of domestic fishing population, and vast pool of unemployed youths in the study area. Thus, aquaculture, which is the application of farming techniques to the breeding and rearing of fish and other aquatic organisms directly or indirectly useful to mankind, remains a highly promising option (Aweze, 2012).

Moses (2019) supported that poor timing in implementation, political opposition during implementation and compromises during policy implementation were responsible for poor development of fisheries sector.

It is pertinent to note that artisanal fisheries had been in existence before Bayelsa State was created. Hence, the state government formulated policies to guide the development of the

artisanal fishery sector (Alamieyeseigha, 2015). A purposeful plan of action that an actor or group of actors follows to address an issue or subject of concern is known as a policy. Egonmwan (2020) defined policy as whatever government had chosen to do or not to do. According to Njoku (2011), public policy is a governmental agenda that is expressed in the country's laws or in a public declaration made by a capable government official. In the context of this research, fishery policy is governmental agenda that is either expressed in the country's laws or in a public declaration made by competent fisheries (governmental) officials to address identified fisheries problems to enhance fish production. Thus, a government without a clear plan of action is like a traveler without a goal (Kwesmiju, 2013).

The fisheries policies, according to Otobo (2010), should be well articulated in such a manner that can achieve sustainable fishery industries in the nation. According to the World Bank (2018), a sustainable industry is one that satisfies current demands without endangering the capacity of future generations to satisfy their own demands for gradual improvements in the standard of living for all of its constituents. To guarantee the fulfilment and continuous fulfilment of human needs for current and forthcoming generations. The FAO (2022) defined fisheries policies as the management and preservation of the basis of natural resources as well as the direction of institutional and technical progress. Ballara (2011) argues that human survival is contingent upon the prudent utilisation of renewable resources, abstaining from actions that devastate cultures or civilizations, and promoting their full potential. Any policy's likelihood of success mostly depends on how well-established the country's education system is (Njoku, 2011).

It should be noted that it is the artisanal fisheries that is in full operation in the study area hence, the main thrust is on small-scale fisheries policies using the programme effectiveness as the tool. Effectiveness is an indication of the impact of a group of activities performed on the achievement of intended learning outcome. It is the observed impact of the implementation of the fisheries policies in achieving its set goals and objectives (Olaitan in Ekele, 2019). An effective fisheries policy is result oriented. It is rooted on functional components whose characteristics enhance the achievement of results within the framework of the set goals.

Moses (2019) however, decried that fisherman especially in the Niger Delta areas, indiscriminately uses chemicals and explosives to kill fish and other aquatic organisms. Besides, there are various tangible and intangible impediments in the water and its content. Consequently, there is heavy silting leading to shallow depths and depletion of aquatic resources culminating into gross inadequacy of fish supply, abject poverty and youth's restiveness. There are incessant cases of sea piracy, maiming, kidnapping, poaching among others. Worst still, there is the use of unapproved fishing gears by fishermen in exploiting resources in the seas, oceans, rivers, creeks and other water bodies which adversely pollutes the aquatic environment and caused health challenges to human that consume such polluted aquatic resources.

In the view of Alamieyeseigha (2015), the impact of human resources development and production incentives, is minimal in the study area. Fish farmers, according to the author, could not secure development loan and grants because of collaterals and bureaucratic bottlenecks. Politicians misappropriated federal funds and inputs intended for fish growers and fishermen in order to further their own interests. More so, outboard engine boats that were provided for extension agents were diverted for their personal use. Consequently, extension agents never visited any fishermen or fish farmers to deliver their services. The persistent absence of extension agents among fish farmers, as documented by Apata et al (2018), underscores a critical weakness in Nigeria's agricultural extension system. The study revealed that nearly a quarter of fish farmers in South-Western Nigeria reported never receiving any form of

extension support, highlighting a significant disconnect between policy intentions and field-level implementation. This lack of engagement not only hampers knowledge transfer and innovation uptake but also stifles productivity and sustainable practices within the fisheries sector. In furtherance of the non-performance of the extension agents in the study area, fisheries development activities are not coordinated. Hence, poor achievement of the objectives of fisheries policies implementation, culminating into hunger, hanger and criminality. It became necessary therefore, to investigate the measures for effective implementation of fisheries policies hence this study. Specifically, the study:

(i) identified fisheries policies and corresponding objectives for food security;
(ii) determined challenges to fisheries policy implementation; and
(iii) determined measures for effective implementation of fisheries policies in Bayelsa State.

Research Questions

The following research questions guided the study.

1. What are the fisheries policies and corresponding objectives for food security?
2. What are the challenges to fisheries policy implementation?
3. What are the measures for effective implementation of fisheries policies in Bayelsa State?

Hypotheses

The following hypotheses were tested at 0.05 level of significance.

1. There is no significant difference in the mean ratings of the responses of male and female agricultural science teachers on the fisheries policies and corresponding objectives for food security.
2. There is no significant difference in the mean ratings of the responses of male and female agricultural science teachers on the challenges to fisheries policy implementation.
3. There is no significant difference in the mean ratings of the responses of male and female agricultural science teachers on the measures for effective implementation of fisheries policies in Bayelsa State.

METHODOLOGY

Bayelsa State served as the area of the study. The research design used was a descriptive survey design. The study answered three research questions, while three null hypotheses were tested at the $P \leq 0.05$ alpha. The target population for the study consists of all the agricultural science teachers in all the public secondary schools in the study area. Bayelsa State has a total of two hundred and sixteen (216) public secondary schools, with a total population of two hundred and forty-two (242) agricultural science teachers; Brass LGA (12), Ekeremor LGA (12), Kolokuma/Opokuma LGA (14), Nembe LGA (14), Ogbia LGA (44), Sagbama LGA (31), Southern Ijaw LGA (24) and Yenagoa LGA (91) respectively. (Source: Bayelsa State Post Primary Schools Board, 2025). Since the targeted population of two hundred and forty-two (242) respondents are manageable, it was therefore adopted as the sample of the study. Hence, the census sampling technique was used.

A 25-item structured questionnaire designed by the researchers was used to gather the data. It was designed using a 4-point rating system, with Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Three professionals in agricultural education from

the Department Agricultural Science Education, Faculty of Education, Niger Delta University, Wilberforce Island, Bayelsa State performed face validation on the instrument. In determining the firmness of the instrument, it was tested on 10 similar respondents in Rivers State and the data collated were analyzed using Cronbach Alpha reliability which yielded a coefficient of 0.76. The rationale for the choice of respondents from Rivers State for the reliability test was informed by the fact that it has similar academic features with the area under study.

Six (6) qualified research assistants and the researchers—joined the process to guarantee high-quality data gathering from the respondents. Each of the research assistants covered their LGAs, while the researchers also covered theirs. Out of the 242 copies of the questionnaire that were sent to the participants, 226 copies were fully completed and retrieved—or approximately 93.5% retrieval rate. These copies were included in the analysis. The weighted mean was used in the analysis of the collected data, and t-test statistics was employed to test the null hypotheses at the 0.05 alpha level. The outcome was interpreted as either agree or disagree using a 4-point rating scale with a cut-off value of 2.50. This meant that items with a mean value of 2.50 or higher were deemed to be in agreement, whereas those with a mean value of 2.49 or lower were deemed to be in disagreement. In a similar vein, if an item's standard deviation fell between 0.00 and 1.96, it confirmed that participants were open to the mean and each other's opinions, which is why the statement was deemed legitimate.

In testing the hypotheses, the hypothesis of no significant difference was accepted for items whose p-values were equal to or greater than 0.05 alpha level. Also, the hypothesis of no significant difference was rejected for items whose p-values were less than 0.05 alpha level with 240 degrees of freedom.

RESULTS

Research Question 1

What are the fisheries policies and corresponding objectives for food security?

Table 1: Mean ratings and t-test analysis of the fisheries policies and corresponding objectives for food security.

Item No.	Policy	Objective	$\bar{X}_1$	$SEx^{-}1$	$\bar{X}_2$	$SEx^{-}1$	t-cal	Remark
1.	Restriction on importation of fish.	To encourage local production of fish.	3.32	0.87	3.12	0.97	1.43	NS
2.	Human resources development and production incentive.	To produce enough skilled fishermen for fishing industries and increase fish production.	3.34	0.87	3.17	0.98	1.21	NS
3.	Provision of grants and loans to fishermen.	To financially assist them as an encouragement to increase production.	3.36	0.78	3.16	0.98	143	NS
4.	Provision of fishery extension services to fishermen.	To improve fishermen efficiency.	3.25	0.97	3.10	1.03	1.07	NS

5.	Coordination of fishery development in the state by federal government through its ministry of agriculture and natural resources.	To encourage the state for massive fish production.	3.32	0.88	3.10	1.07	1.57	NS
6.	Integrated rural fisheries development project for fishing communities.	To generally raise the standard of living of the fishermen and their families.	3.15	1.08	3.10	0.78	0.36	NS

Key: t-tabulated ±1.96; df (240), X_1=male, X_2=Female

According to Table 1, it was observed the mean ($\bar{x}$) values varied from 3.15 to 3.36 for male respondents and 3.10-3.17 for female respondents respectively, and were all higher than the 2.50 benchmark value. They are thus assumed to agree. This meant that every respondent was in agreement that the six items related to fisheries policy and their goals for food security. The assertions were genuine since the standard deviation values were below ±1.96, ranging from 0.78-1.08 for male respondents and 0.78-1.07 for female respondents respectively. This suggests that the participants' replies were similar to one another.

Table 1 also demonstrates that the computed t-values for each of the six items fell between 0.36 and 1.59, which is < t-tab. value of ±1.96 with 240 df at the 0.05 alpha level. As a result, the null hypothesis which states that there is no significant difference in the mean ratings of the responses of male and female agricultural science teachers on the fisheries policies and corresponding objectives for food security is retained.

Research Question 2

What are the challenges to fisheries policy implementation?

Table 2: Mean ratings and t-test analysis of the challenges to fisheries policy implementation.

Item No.	Problems of policy implementation	$\bar{X}_1$	SEx¯1	$\bar{X}_2$	SEx¯1	t-cal	Remark
1.	Inadequate definition of goals.	3.21	1.01	3.01	1.08	1.43	NS
2.	Overambitious policy goals.	3.21	1.03	3.09	1.04	0.86	NS
3.	Paucity of well-defined programmes for attainment of goals.	3.36	0.78	3.09	1.00	1.59	NS
4.	Choice of inappropriate organizational structure in implementation of policies.	3.22	0.98	3.01	1.12	1.50	NS
5.	Lack of continuity in commitment to policy.	3.16	1.07	3.04	1.10	0.86	NS
6.	Lack of clear definition of responsibility.	3.23	0.95	3.01	1.14	1.57	NS
7.	Political opposition during implementation.	3.24	0.97	3.08	1.03	1.43	NS
8.	Compromises during implementation capable of defeating policy purposes.	3.22	1.02	2.99	1.10	1.64	NS
9.	Political insensitivity to demands.	3.33	0.82	3.18	0.91	1.07	NS
10.	Poor timing in implementation.	3.32	0.82	3.14	0.97	1.29	NS
11.	Corruption.	3.28	0.89	3.23	0.87	0.36	NS

Key: t-tabulated ±1.96; df (240), X_1=male, X_2=Female

Table 2 data showed that the mean ($\bar{x}$) values of all eleven items varied from 3.16 to 3.23 for male respondents and 2.99 to 3.23 for female respondents respectively, were above the 2.50 cut-off mark. This leads one to view them as agreeable. This suggests that every one of the eleven statements relates to issues with the fisheries subsector's policy execution. The assertions were legitimate since the standard deviation values, which are below ±1.96, vary from 0.78 to 1.07 for male respondents and 0.87 to 1.14 for female respondents respectively. This implies that the participants' replies were reasonably close to one another.

Table 2 further showed that, at the 0.05 alpha level, the computed t-values for each of the eleven assertions varied from 0.36 to 1.57, which is smaller than the tabulated t-value of 1.96 with 240 degrees of freedom. As such, the null hypothesis which states that there is no significant difference in the mean ratings of the responses of male and female agricultural science teachers on the challenges to fisheries policy implementation is retained.

Research Question 3

What are the measures for effective implementation of fisheries policies in the Niger Delta Region?

Table 3: Mean ratings and t-test analysis of the measures for effective implementation of fisheries policies.

Item No.	Effective policy implementation measures	$\bar{X}_1$	SEx⁻1	$\bar{X}_2$	SEx⁻1	t-cal	Remark
1.	Policy formulators be given free hand by the government to formulate good policies.	3.21	1.01	3.13	1.04	0.57	NS
2.	Fisheries policy goals and objectives should be well articulated and made explicit.	3.17	1.07	3.16	0.96	0.07	NS
3.	Prompt submission of identified problems from the field to the research centres for solution through the agricultural extension staff.	3.21	0.97	3.13	0.99	0.57	NS
4.	Extension agents working in synergy with fisheries experts in universities to proffer solutions.	3.19	0.98	2.96	1.21	1.64	NS
5.	Offer grants, incentives, farm inputs, subsidies and loans with minimum bureaucratic measures to farmers.	3.18	1.03	3.12	1.04	0.43	NS
6.	Federal government direct participation in fish production through Nigerian fish company.	3.26	0.96	3.08	1.01	1.29	NS
7.	Invitation of competent and reliable fishery companies to handle infrastructural facilities and other technicalities in fishery policies formulation and implementation.	3.32	0.88	3.10	1.07	1.57	NS
8.	Adoption of multidisciplinary approach for the development of programme formulation.	3.36	0.78	3.09	1.00	1.59	NS

Key: t-tabulated ±1.96; df (240), X_1=male, X_2=Female

According to the data in Table 3, the mean ($\bar{x}$) values for each of the eight (8) items varied from 3.17 to 3.36 for male respondents and 2.96 to 3.16 for female respondents respectively, and were all higher than the 2.50 threshold. This leads one to view them as agreeable. This indicates that every respondent was in agreement that the eight (8) statements were strategies for the efficient execution of fisheries regulations within the research area. The assertions were legitimate since the standard deviation values, which are below ±1.96, vary from 0.78 to 1.07 for male respondents and 0.96 to 1.21 for female respondents respectively. This implies that the participants' responses were reasonably close to one another.

Table 3 further demonstrated that the computed t-values for each of the eight (8) assertions fell between 0.07 and 1.64, which was less than the t-tab. value of ±1.96 with 240 df at the 0.05 alpha level. As such, the null hypothesis which states that there is no significant difference in the mean ratings of the responses of male and female agricultural science teachers on the measures for effective implementation of fisheries policies in Bayelsa State is retained.

Discussion of findings

The discussion of the study's results followed the sequence of the research questions. The data in Table 1 revealed six fisheries regulations, according to the research. The six fisheries regulations include: 1) restriction on importation of fish; 2) human resources development and production incentives; 3) provision of grants and loans to fishermen; 4) provision of fishery extension services to fishermen; 5) co-ordination of fishery development by Federal Government through its Ministry of Agriculture and Natural Resources; and 6) integrated rural fisheries development project for fishing communities. The results of this investigation are consistent with the findings of Ike and Jimamah's (2016) which examined fisheries policies and their accompanying goals. According to Table 1's t-test analysis, there was no discernible difference between male and female agricultural science teachers' mean assessments of the fisheries policies and related goals for food security. This result agrees with the submission of Egonmwan (2020) who averred that the submission of male and female agricultural science teachers on fisheries policies and corresponding objective for food security is one and the same. The implementation of fisheries policies is crucial for sustainable aquatic resource management, food security, and economic development. However, various challenges impede effective policy execution, particularly in regions like Nigeria and broader Africa. According Consultative Group on International Agricultural Research [CGIAR] (2025), Nigeria's National Fisheries and Aquaculture Policy (2025–2029) aims to enhance food security, support sustainable livelihoods, and build resilience against future challenges. Key objectives include improving infrastructure for processing, storage, and transportation, promoting sustainable fishing practices, and empowering small-scale fishers with training and technical support.

The result in Table 2 indicates that all the eleven statements were challenges to fisheries policy implementation. Such challenges to fisheries policy implementation include: inadequate definition of goals, overambitious policy goals, paucity of well-defined programmes for attainment of goals, choice of inappropriate organizational structure in implementation of policies, lack of continuity in commitment to policy, lack of clear definition of responsibility, political opposition during implementation, compromises during implementation, political insensitivity to demands and poor timing in implementation. The above result in Table 2, are in tandem with the submission of Moses (2019) who decried that policy implementation, has inherent challenges, like the aforementioned ones. Hence, Ita (2020) advised educators to be more proactive especially during policy implementation. The t-test analysis in the same Table 2 also made it clear that there was no discernible difference between the mean ratings of male

and female agricultural teachers' comments about the challenges associated with implementing policies. These results are in harmony with the view of Achimugu (2020) who affirmed that the opinion of male and female agricultural teachers on challenges to fisheries policy implementation, are one and the same. It was on this premise that the study found eight (8) measures for effective implementation of fisheries policies as contained in Table 3.

The result in Table 3, such as granting policy formulators and implementers free hand to formulate good policies and effectively implement them, well-articulated and explicit of fisheries policy goals and objectives, collaborative services between extension agents, farmers and fisheries experts in research centres, provision of grants; incentives; farm inputs; subsidies and loans to farmers, Federal Government direct participation in fish production through Nigerian fish company, engaging competent and reliable fishery companies to handle infrastructural facilities and technicalities and adoption of multidisciplinary approach in developing programme formulation. are in congruent with the report of World Bank (2018) who advised the: adoption of multidisciplinary approach for the development of programme formulation, use of competent and reliable fisheries companies to handle infrastructural facilities, use of an explicit well-articulated fisheries policy goals and objectives among others. The t-test analysis in Table 3 further demonstrated that there was no statistically substantial disparity in the mean evaluations of the replies from agriculture education lecturers in rural and urban areas about the strategies for the successful implementation of fisheries policy in the Niger Delta Region. The results agree with the evidence given by Okafor (2014) who averred that the submissions of rural and urban lecturers of agricultural education on policy implementation measures, were same measures opined by urban lecturers of agricultural education. It was on this premise that Suwari (2018) and FAO (2022) opined that the successful implementation of these policy measures, would enhance the attainment of the objectives of agricultural education programme, in the nation. The results of the studies in this study support the conclusions of this investigation and further enhance the reliability and validity of the findings.

CONCLUSION

The Niger Delta Region, Nigeria, though is gifted with sufficient water bodies with rich fisheries, however, fishermen and fish farmers are indiscriminately using chemicals, explosives and other unapproved gears to kill fish and other aquatic organisms. Besides, there is heavy silting process leading to shallow river depths and consequential depletion and extinction of aquatic resources culminating into hunger, abject poverty and youth restiveness. The study thus, identified six (6) fisheries policies and corresponding objectives, eleven (11) problems of policy application and eight (8) measures for effective policy implementation. There was no substantial disparity in the mean ratings of rural and urban lecturers of agricultural education on the measures for effective implementation of fisheries policies in the study area. If the findings of the study are therefore, developed into a training manual and packaged for students, agricultural education lecturers, administrators, policy makers, curriculum planners and stakeholders in the education and fisheries industries, it will enhance the effective implementation of fisheries policies and ultimately improve quality protein consumption.

RECOMMENDATIONS

Based on the major findings of the study, the following recommendation were made.

1. Fishery policy makers should ensure that only valid and reliable fishery policies with achievable objectives should be used.

2. Fisheries policies that are compatible with the maritime environment should be religiously implemented using competent resource personnel.
3. In line with the identified problem, effective policy implementation measure should be religiously adopted, such as provision of grants, incentives, farm inputs, subsidies and loans to farmers, collaborative services between farmers, extension agents and fisheries experts in research centres.

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