Analysis Of Agricultural Policy On Catfish Value Chain In Akwa Ibom State, Nigeria

Obot Akaninyene, Osuafor Ogonna , Nwigwe Cecilia , Ositanwosu Chukwunonso

Department of Agricultural Economics and Extension, Nnamdi Azikiwe University, Awka, Anambra State, Nigeria.

***Abstract*: The study used Policy Analysis Matrix (PAM) to analyze the effect of government policies on catfish value chain. The Nominal Protection Coefficient (NPC) on tradable outputs and input, respectively, indicates implicit tax or subsidies on the commodity under study. The Effective Protection Coefficient (EPC) combines the two NPC's to assess the overall effect of implicit tax and subsidy through both output and input markets. An NPC < 1 indicates an implicit tax on production (subsidy in the case of an input), and an NPC > 1 indicates an implicit subsidy on production (tax in the case of an input). The result showed that Nominal protection coefficient on tradable outputs (NPCOs) were less than unity indicating that the catfish value chain industry in the study area was undervalued by ₦0.8/kg. This suggests that the catfish value chain industry was not protected by policy and that more particularly, it was subjected to substantial output taxation. Also, the Nominal protection coefficient on tradable inputs (NPCIs) were less than unity which showed that government support or subsidy maybe reducing tradable inputs cost for the catfish value chain industry by ₦0.8/kg. The Effective Protection Coefficients (EPCs) were equally less than unity in the study area and faced taxation of ₦0.8/kg on value added resulting from employing domestic factors of production. This indicated that value addition processes in the catfish value chain industry were not protected through policy intervention and that they faced a net tax of 0.92%.**

Keywords: **Agricultural Policies, Catfish Value Chain, Policy Analysis Matrix**

I. INTRODUCTION

Agriculture is important to the sustenance of every society and serves as the back bone of economic development, especially in the provision of adequate and nutritional food for human development and raw materials for industry. Agriculture is critical to achieving national poverty reduction targets and it is still the single most important productive sector in Nigeria aside from oil, often in terms of its share of Gross Domestic Product and almost always in terms of the number of people it employs. Sustainable agricultural development in any country is propelled by agricultural programmes. The Nigerian government has come up with various strategies to improve the situation. Efforts are now been made to restore agriculture back to its original status before the oil boom and stamping out food insecurity. Several policies and initiatives are now being developed with the aim of providing efficient framework to address food insecurity and malnutrition in Nigeria. Despite the comprehensiveness of the numerous programs and projects, effective implementation could hardly be achieved due to poor governance and corruption. Only until the re-emergence of the civilian administration in 1999 that the much needed attention was given to the agriculture sector and food production. The government thus, restated its commitment to face-out hunger and malnutrition through ensuring adequate food supply. To achieve this according to Ojo & Adebayo (2012), the government initiated a number of food security initiatives, which included: i. Special Program for Food Security (SPFS): SPFS is an initiative through which the Nigerian government seeks the support of the Food and Agriculture Organization (FAO). The program is aimed at delivering information on new accessible agricultural technologies that has been tested to 109 farming communities scattered across Nigeria's four geo-political zones to improve food production and accessibility as well as to significantly increase the farmer's returns from harvest. ii. Root and Tuber Expansion Program: This agricultural program is funded by the International Fund for Agricultural Development (IFAD). The initiative helps to build farmer's capacity on latest technologies for processing tuber and root products and expansion technique particularly for cassava products. iii. Fadama Development Project: With funds from various international organizations, the Fadama project was established by the Nigerian government to enable farmers carry on their farming activities all through the year and enjoying an all-season farming. Activities of the program include development of infrastructure, large-scale irrigation, improving farmer's capacity, and creating environmental awareness. iv. Community-based agricultural and rural development schemes: This includes various development schemes and programs like "farm settlement" and "back-to-land" schemes. Such schemes are developed to encouraged the public participate more in farming through making farming implement more easily accessible and providing them with various incentives. v. Provision of infrastructures: The government embarked on infrastructural projects such as building new link-up roads in the rural areas and carrying out maintenance of existing ones, electrification of the rural settlements, supplying farmers with necessary farm inputs as fertilizer, seedlings and equipment; leasing farm machineries like harvesters and tractors as well as storage facilities to farmers or outright sale to farmers that can afford them to facilitate mechanized farming practice and reduce post-harvest loss. vi. International Centre for Soil Fertility and Agricultural Development (ICSFAD): Nigerian government also inaugurated the International Centre for Soil Fertility and Agricultural Development (ICSFAD) in conjunction with the United States. The objective here was to study the factor

affecting increased agricultural production in the Nigeria. The Centre was to carry out assessment of soil of various types from different Nigerian locations with the aim of determining the type of fertilizer that will be appropriate for farmers on each soil type. vii. Policy instrument: This refers to the policy instrument and direction through which the government carries out activities such as a. Banning the importation of some agricultural products which the county can locally produce at sufficient volume. The ban tremendously helped boost the livestock production and agriculture. b. Making fertilizer available to farmers at a subsidized rate c. Improving financing of the agriculture sector through provision of additional funds for state-owned agricultural banks to enable them grant more soft-loans to farmers, and encouraging the conventional banks to grant low-interest loans to all classes of farmers.

The fisheries subsector of the Nigerian agriculture is an essential tool for rural development through its provision of income, high-quality protein, and socioeconomic development of fishing communities in Nigeria. The relevance of the fisheries sector to the Nigeria economy and benefits derived by Nigerians from fish and other fish products led to the high consumption and hence the increased demand for fisheries products. In order to meet up with increasing demand for fisheries products, Nigerian federal governments have tremendously implemented a series of projects targeted at increasing the local supply of fish (Olaoye and Ojebiyi (2018). In Nigeria, fisheries contributed 0.88 % to the Agriculture GDP and it contribution of Agriculture to Nigeria GDP was 22% (FDF, 2018). FDF 2018 also stated that the subsector provides employment for 8.632million people in the primary sector and 19.55million people in the secondary sector. Otubusin (2011) stated that fish production in Nigeria comes from three sources; artisanal (inland rivers, lakes, costal and brackish water), aquaculture (fish farm) and industrial fishing. In 2015, the total domestic production was 1.027, 058.00 million metric tonnes. Artisanal fishery contributed 67.7% (694, 867.00 metric tonnes); aquaculture fishery contributed 30.8% (316,727.00 metric tonnes) and industrial fishery contributed 1.5 % (15,464.00 metric tonnes) (FDF 2018). Major fish species produced in Nigeria include Torpedo-shaped catfishes (Clarias spp.), Tilapias (hemichromis/ oreochromis.spp), Smoked fishes, Torpedo-shaped catfishes (heterobranchus.spp), African carps (cyprinidae), Marine fishes (osteichthyes) Elephantsnout (mormyridae, gnathonems spp.), Nile/Niger perch (lates niloticus), Bonga shad (ethmalosa fimbriata), Torpedo-shaped catfishes (clarias lazera) and Bonytongue fishes (heterotis spp.).

A value chain is a business model that describes the full range of activities needed to create a product or service. For companies that produce goods, a value chain comprises the steps that involve bringing a product from conception to distribution, and everything in between—such as procuring raw materials, manufacturing functions, and marketing activities.

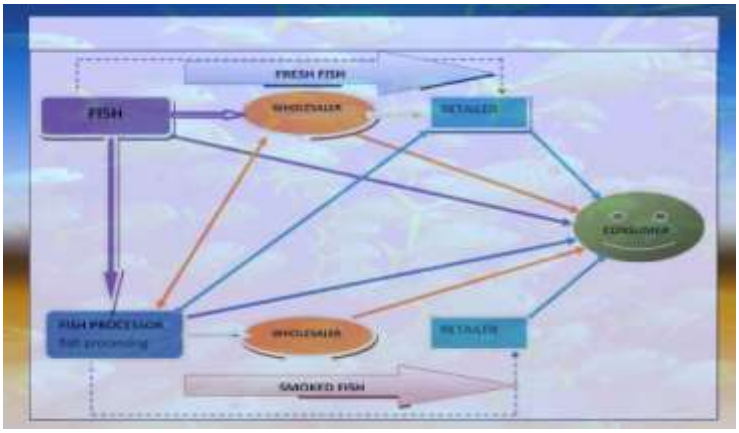
Catfish Value Chain links the movement of fish products from the farmers to the consumers, including input suppliers, production, processing, marketing and finance.

Producer A (purchase broodstock, purchase hormone, purchase production equipment/materials, feed) – connection with input suppliers (who also connect with materials producers/wholesaler/retailers); produce fish seeds, rear fish; sell fish seeds to other producer B- connection with input demander (who also connect with input suppliers); PRODUCER A & B patronize transport company (private or public) for movement of inputs, products and services – connection with logistics and transportation. Producers A & B sell fish to middlemen, processor and direct consumers

Fish Monger/Midddlemen (buys from Producers A & B) - Link with Producers; purchase fish holding equipment/facilities – Connection with Input/material supplier (who also connect with materials producers/wholesaler/retailers); patronize transport company (private or public) for movement fish to sales outlets; sells fish to processor

Fish Processor - Link with Producers (could also be the producer); purchase fish holding equipment/facilities – Connection with Input/material supplier (who also connect with materials producers/wholesaler/retailers) such as kiln, charcoal, wood, salt etc; patronize transport company (private or public) for movement fish to sales outlets; sell fish to middlemen/women, grocery stores, and direct consumers.

Fish Consumer – Link directly and indirectly with Producers, middlemen/marketers, processors to purchase fish, fresh and/ processed.



Olusola, 2017

Nigeria current population is 205,827,739 (UN, 2019). With an estimated annual per fish consumption of 17.5kg by FAO, Nigeria projected fish demand for 2018 was 3.61million metric tonnes (FDF 2018). Nigeria is the largest consumer of fish products in Africa. Over the years Nigeria has relied on the importation of fish to meet her ever increasing demand.

FAO reported that Nigeria is a net importer of fishery products giving its total fish imports amounting to about USD 1.2billion and exports valued at USD 284 390million in 2013. FAO (2000) estimated the projected population and fish demand supply from 1997 to 2025, with domestic fish production by the year 2015 to be 1.12million tonnes. This has put Nigeria as the largest aquaculture producer in Sub-Saharan Africa and this importance is steadily increasing at average growth of 20,000mt of cultured fish in Nigeria per year. Several efforts have been made to implement policies and programs to bridge the gap between demand and supply of fish in Nigeria.

The vision of the current administration for agriculture is to work with key stakeholders to build an agribusiness economy capable of delivering sustained prosperity by meeting domestic food security goals, generating exports, and supporting sustainable income and job growth. In response to the need to end hunger and malnutrition in Nigeria, the current government took appropriate step with the implementation of a new Agriculture Promotion Policy (2016-2020) also referred to as "The Green Alternative". The go forward federal priorities (in partnership with State Governments) are the following four: food security; import substitution; job creation; and economic diversification. Within the set of policy principles, the framework maintained that the Federal Government will concentrate on providing an enabling environment for stakeholders at federal and state level to play their distinctive roles. The policy emphasis was on providing a conducive legislative and agricultural knowledge framework, macro policies, security enhancing physical infrastructure and institutional mechanisms for coordination and enhancing access to adequate inputs, finance, information on innovation, agricultural services and markets (FMARD, 2017).

There is a need to examine how the government policy affects farm level economic profitability of catfish value chain industry in Akwa Ibom State. The Policy Analysis Matrix (PAM) technique developed by Monke and Pearson (1989) was used in this study. Farm level data were used to estimate private profits and different world prices were used to estimate social benefits and costs of producing, processing and marketing catfish in Akwa Ibom State. The PAM results were used to calculate the nominal protection coefficients (NPCs) and effective protection coefficient (EPC).

Table 1 Structure of the Policy Analysis Matrix (PAM)

	Revenue	Cost of Intermediate Inputs		Profits
		Tradable Inputs	Domestic Factors	
Private Profit	A	B	C	D
Social Profit	E	F	G	H
Divergences	I	J	K	L

Source: Monke and Pearson, 1989.

Private profits (D) = (A - B - C) and social profits (H) = (E - F - G). Output transfers (I) = (A - E); input transfers (J) = (B - F) and factor transfers (K) = (C - G). Net transfers (L) = (D - H); or (I - J - K). Nominal protection coefficient on tradable outputs (NPCO) = A/E. Nominal protection coefficient on tradable inputs (NPCI) = B/F. Effective protection coefficient (EPC) = (A - B)/(E - F).

Generally, PAM constitutes two accounting identities. The first identity defines profitability as the difference between revenue and costs and the second identity measures the effect of divergences (distorting policies and market failure) as the difference between observed parameters and parameters that would exist if the divergences were removed. Profits are defined as the difference between total (or per unit) sales revenues and costs of production. This definition generates the first identity of the accounting matrix. In the PAM, profitability is measured horizontally, across the columns of the matrix (Table 1). Profits, shown in the right-hand column, are found by the subtraction of costs, given in the two middle columns, from revenues, indicated in the left-hand column. Each of the column entries is thus a component of the profits identity.

Intermediate inputs are divided into tradable-input and domestic factor components. Tradable inputs are transacted in the international market, which serves as a basis for their valuation. Primary domestic factors, such as land, labor and capital are non-tradable and thus are treated separately (Table 1). Private values are the observed quantities multiplied by the market costs and returns. These implicitly include the effects of all policy interventions, in both direct and indirect subsidies and taxes, and all market distortions and failures (Monke et al., 1989). They are identical to the financial values of cost-benefit analysis. The second row of the PAM identifies social profit. Values in the second row provide a benchmark policy environment for comparison purposes (Masters, 1995). Information in Table 1 is also used to calculate different profit and market incentive measures. Private profits (D) = A - (B + C), measure competitiveness in market prices. Social profits (H) = E - (F + G), measure efficiency (or comparative advantage) in efficiency prices. For an efficient market, social profits equal private profits. Divergences cause market prices to differ from efficiency (social) prices. Divergences arise from either market failures due to monopoly or oligopoly, externalities, and factor market imperfections, or due to distorting policies that force markets to diverge from efficient prices. Output divergences (I) = A - E, cause private revenue to differ from social revenue. A positive value of one (1) indicates an implicit subsidy or transfer of resources in favor of the commodity under study. A negative value of one (1) indicates an implicit tax or transfer of resources away from the commodity under study. For input divergences (J) = B - F, and factor divergences (K) = C - G, positive values of J or K indicate implicit tax, and negative values indicate implicit subsidies (i.e. production costs are higher than in the efficient market). Net divergences (L) = D - H = I- (J+K), are the sum

of implicit taxes and revenue and represent net transfers. Negative values indicate that implicit taxes are greater than subsidies and vice versa (Pearson & Monke, 1995). Other important ratios that can be calculated from Table 1 include: the nominal protection coefficient on tradable outputs (NPCO): A/E; the nominal protection coefficient on tradable inputs (NPCI): B/F; and the effective protection coefficient (EPC): (A - B)/(E - F). The protection coefficients are used to measure the effects of distortion policies or market failure, and cost ratios are used to measure comparative economic advantage (Masters & Winter-Nelson, 1995). The NPC on tradable outputs and input, respectively, indicates implicit tax or subsidies on the commodity under study. The NPCs ratios compare the observed private price with a comparable world price, adjusted for marketing costs and exchange rates. An NPC < 1 indicates an implicit tax on production (subsidy in the case of an input), and an NPC > 1 indicates an implicit subsidy on production (tax in the case of an input). The EPC is actually a ratio of value added in private prices to value added in world prices, indicating the effect of protection or market failure on value added. It shows the tax or subsidy on value added created by employing domestic factors of production. The EPC combines the two NPC's to assess the overall effect of implicit tax and subsidy through both output and input markets. The ratio indicates the effect of protection or market failure on value added. The economic meaning of divergence and ratios calculated from the PAM are summarized in Table 2.

Nigeria neither import nor export catfish except till date produce, process and market for the local consumption only. As such this research adopted the convention factor for all it calculations. The social revenue was calculated by multiplying the market revenue by the conversion factor, which is an assumed foreign exchange premium. 1.25 was used for revenue and tradable inputs, 1.00 for non-tradable inputs (domestic factors), 0.28 for fixed factors and 0.37 for credit facilities (Monke et al., 1989). Social costs for the considered items were also calculated in the same way.

Table 2 : Important Economic Results From The Social Accounting Matrix (SAM)

Type of Divergence [1, 2]	Value and Economic Meaning	
	Positive	Negative
Output (I=A-E)	Implicit subsidy	Implicit tax
Input (J=B-F)	Implicit tax	Implicit subsidy
Factor (K=C-G)	Implicit tax	Implicit subsidy
Profit (L=D-H=I-J-K)	Implicit subsidy	Implicit tax
Calculated ratio [1, 2]	<1	>1
Nominal Protection Coefficient on tradable output (NPCO)	Implicit tax	Implicit subsidy
Nominal Protection Coefficient on tradable inputs (NPCI)	Implicit subsidy	Implicit tax
Effective Protection Coefficient (EPC)	Implicit tax	Implicit subsidy

Notes: [1] See table 1 for details

[2] If all divergences equal to zero and all ratios equal to one, the good is produced in the competitive market

II. MATERIALS AND METHODS

Nigeria is a maritime nation where 9 out of the 36 states have a coastline in the Atlantic Ocean. The coastal federal states of Nigeria are Ogun, Lagos, Ondo, Edo, Delta, Bayelsa, Rivers, Akwa Ibom, and Cross Rivers States, all found in the southern part of the country. The Niger Delta is located on the Atlantic coast of southern Nigeria where River Niger divides into numerous tributaries (Awosika, 1995). The area lies between latitudes 40 15'N and 60 30'N and between longitude 40 30'E and 80 30'E (Onojeghuo & Blackburn, 2011). The region spans over 70,000km^2 and has been described as the largest wetland in Africa. About 2,370km^2 of the Niger Delta area consists of rivers, creeks, and estuaries and stagnant swamps covering about 8,600kilometres (Etiosa & Ogbeibu, 2007). The region cuts across the nine oil producing States in southern Nigeria which include Abia, Akwa-Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers States. Fishing, farming, and petty trading are the predominant economic activities of the region.

The study was conducted in Akwa Ibom State. Akwa Ibom State is richly endowed with abundant inland water-bodies, flood plains-wetlands which are highly productive and ideal for artisanal fisheries and aquaculture development (Akwa Ibom State Economic Empowerment and Development Strategy (SEEDS, 2005).

Akwa Ibom State is located in south-south Nigeria and is one of the fish producing states in Nigeria. The State lies between latitude 4°31" and 5°31" North and longitude 7°35" and 8°35" East; occupies a total land area of 7, 254, 935km^2 and has an estimated population of 3, 920, 208 (National Population Commission, NPC, 2006). It also has a major concentration of fish farmers. The Akwa Ibom State fish industry has been a major player in the economy of the state and means of livelihood of the citizens. The industry has registered farmers all situated in single well laid out industrial locations. The data on the costs and returns to fish production, processing and marketing were collected from operators in the industry.

The key informants were the major producers, processors and marketers in the industry provided the initial overview of the industry. Based on the overview provided, the industry was categorized into three, namely: production and processing and marketing. Data on costs and returns were collected from purposively selected operators. The basis of selection is the availability of record on fishing operations. Data collection was carried out through personal interviews, direct observation and extraction of data from the records kept.

Four local government areas were selected on the basis of their prominence in the fish industry: Ikot Ekpene, Itu, Uruan and Mbo local government areas. Data were collected from a sample of 135 catfish farmers stratified into producers, processors and marketers (45 producers, 45 processors and 45 marketers) using a pretested questionnaire.

The primary data used in this study came from questionnaires administered to 135 catfish farmers. The questionnaires were developed based on literature review and discussions with catfish industry experts. There were three questionnaires. The first questionnaire was developed for the catfish producers, the second questionnaire for the catfish processors and the third for the catfish marketers. I divided the survey in this manner in order to develop a budget for the catfish industry. Issues like catfish production, catfish prices, cost of labor, cost of water, cost of land, revenues received, and income of the processing and marketing were the main foci of the questionnaire.

Farm level private unit revenue or price (₦/kg) was estimated as average price received by the farmer. Unit costs of tradable inputs (₦/kg) were calculated as total cost of inputs divided by quantity of live catfish produced. For computing social price and costs of producing live catfish in Akwa Ibom State, different assumptions were made. Tradable inputs included chemicals, energy, overhead, and feed costs. Chemical costs included all costs incurred for chemicals used in catfish production that included salt and lime for pH control and other chemicals for controlling fungi growth. Energy costs included electricity and fuel expenses. Electricity was used mainly to aerate ponds and fuel for running farm vehicles and equipment. Overhead costs included expenses on telephone, farm insurance, accounting fees, office supplies and farm consumables. Feeds costs included all expenses incurred in purchasing all types of fish feeds used on the farm. Costs of non-tradable inputs included cost on land, labor and capital. Cost of land per farm was estimated based on the lease payment for a leaseholder or interest on money borrowed to purchase the land plus costs of maintaining the ponds. Labor costs included wages and salaries paid to farm workers. The labor cost included hired labor, family labor and other direct and indirect costs of hiring and keeping hired labor on the farm. Capital cost was calculated by adding up the interest on money borrowed for constructing ponds and for purchase of farm equipment plus the cost of maintaining or leasing farm equipment. The estimated cost of processing and marketing finished products from a pound of live catfish was about ₦300/kg (i.e. cost of labor, direct production cost such as water and electricity, selling and marketing, and general administration expenses). Moreover, transportation cost of live catfish from farm to processors was ₦200/kg. In addition, catfish farms incurred an additional ₦50/kg for marketing risk management (e.g. buying delivery .rights). However, some of the fish feed ingredients may be purchased from a market distorted by public policies. A typical catfish feed contains about 90% soybean and 10% corn meal. Different government programs subsidize soybean and corn production. Agricultural tariff was 16.6% in 2017 higher than non- agricultural good at 12%. The loan rates from banks stood at between 8 to 14 % for agricultural goods (WTO, 2017).

III. RESULTS AND DISCUSSION

The PAM for catfish farms in Akwa Ibom State is reported in Table 3. The unit price and costs are presented in ₦/kg of live catfish produced, processed and marketed. The net social profit was positive for all farm activities. These results implied that, under an efficient market, catfish farms have the ability to cover both long-run variable costs and earn positive returns on fixed factors such as land and capital equipment. This means that under efficient markets, catfish value chain industry in Akwa Ibom State was socially desirable.

Table 3 : Policy Analysis Matrix for Producers, Processors and Marketers of Catfish in Akwa Ibom State, Nigeria

Producers	Revenues (₦)	Cost of Tradable inputs (₦)	Cost of Domestic inputs (₦)	Profit (₦)
Private	362888.50	135019.85	138852.90	89015.75
Social	453610.63	168770.96	49180.50	235659.17
Policy effect	-90722.13	-33751.11	89672.40	-146643.42
Indicators: NPCO = 0.8, NPCI = 0.8, EPC = 0.8				
Processors				
Private	62637.50	33312.69	28110.75	1214.06
Social	78296.88	41640.87	23692.57	12963.44
Policy effect	-15659.38	-8328.18	4418.18	-11749.38
Indicators: NPCO = 0.8, NPCI = 0.8, EPC = 0.8				
Marketers				
Private	72028.50	58087.50	8291.49	5649.51
Social	90035.63	72609.38	5993.62	11432.63
Policy effect	-18007.13	-14521.88	2297.87	-5783.12
Indicators: NPCO = 0.8, NPCI = 0.8, EPC = 0.8				

Source: Field survey

Policy Effect On The Catfish Value Chain Industry

The industry in table 3 above showed a negative divergence between private and social profits in all activities thus suggested that the net effect of policy intervention reduced profitability of the catfish industry which is detrimental to the actors involved in the value chain. The overall net transfers between output and inputs were negative for catfish value chain industry which indicated that taxation in the output market was greater than subsidies in the input market.

Table 4: Summary of ratios of market failures and competitiveness of the value chain catfish industry in the study area

ACTORS	NPCO	NPCI	EPC
Producers	0.8	0.8	0.8
Processors	0.8	0.8	0.8
Marketers	0.8	0.8	0.8
Average	0.8	0.8	0.8

Source: Field Study

The calculated NPCO(s) in table 4 was less than unity indicating that the catfish value chain industry in the study area was undervalued by ₦0.8/kg. This can be attributed to the limited bargaining power of the actors in the industry. This also indicated that the domestic farm gate price was less than the international price for catfish output and that the policies were decreasing the market price to a level of 0.92% below the international price for catfish. This suggested that production, processing and marketing of catfish were not protected by policy and that substantial output tax applies.

The NPCI(s) was less than unity which showed that government support maybe reducing the cost of production, processing and marketing for the catfish by ₦0.8/kg. This indicated that the input cost in the catfish industry was lower than the world reference price to a level of 0.92%. Thus also suggested that government policies were reducing tradable inputs cost for the catfish industry in the study area and that the industry was subsidized.

The EPC(s) were equally less than unity in the study area and face taxation of ₦0.8/kg on value added resulting from domestic employing domestic factors of production. This also indicated that the producers, processors and marketers were not protected through policy intervention on value added processes, and that they face net tax of 0.92%.

To assess the impact of policies on the profitability of the value chain catfish industry, an average of all the NPC(s) and EPC(s) was estimated. On the average, the value chain catfish industry in the study was still affected by government policies, though the industry's tradable inputs was subsidized but the tax on the value added good was more than the subsidy interventions. Despite above mentioned challenges, the catfish value chain industry in the study area was still profitable.

IV. SUMMARY AND CONCLUSION

The possibility of fish production to match up with fish productivity in the economy depends on fishing operation, efficient use of labour, sustainable and efficient management of fishing policy and management tools such as restricting the effort of fishers through set up of an efficient and effective administration to guide fishers in various communities.

This study used the Policy Analysis Matrix to quantify the influence of government policies on the private and social economic profitability of catfish value chain industry in Akwa Ibom State. Production and cost data obtained through farm surveys were used to estimate private profits. Comparative world prices were used to estimate social profits. Combined, private and social profits were used to estimate implicit tax and subsidies that exist within the catfish value chain activities. The catfish value chain industry in the study area was affected by government policies. Although the industry's tradable inputs were subsidized, the tax on the value added goods was more than the subsidy interventions. As demonstrated in this study, the catfish industry needs some form of protection especially in the output market.

From the foregoing, the following recommendations are made:

- Catfish value chain industry should not be taxed and the inputs should be subsidize
- Ensure adequate follow-up on the implementation of fisheries policies. This will be achieved through the involvement of all stakeholders

REFERENCE

[1] Akwa Ibom *State* Economic Empowerment and Development Strategy (*SEEDS*), (*2005*).

[2] Awosika, L.F., (1995). Impact of Global Climate Change and Sea Level Rise on Coastal Resources and Energy Development. DAMTECH Nigeria Limited.

[3] Etiosa, U., & Ogbeibu, A.E., (2007). Climate Change and Poverty: Sustainable Approach in the Niger Delta Region of Nigeria. Community Research and Development Centre (CREDC), Benin City, Nigeria.

[4] Federal department of Fisheries report (FDF, 2018).

[5] Federal Ministry of Agriculture (FMARD) (2017). The Green Alternative (TGA): Nigeria's agriculture promotion policy 2016-2020 Document.

[6] Food and Agriculture Organization (FAO), (2000). Fish production projection in Nigeria for 2000 -2025.

[7] Masters, WA. (1995). Guidelines on national comparative advantage and agricultural trade. Agricultural Policy Analysis Project, Phase III, Methods and Guidelines, Number 2001, USAID, Washington, D.C.

[8] Masters, W.A. & Winter-Nelson, A. (1995). Measuring the comparative advantage of agricultural activities. Domestic resources costs and social cost-benefit ratio. American Journal of Agricultural Economics, 77,243-50.

[9] Monke, E.A. & Pearson, S.R. (1989). The Policy Analysis Matrix for Agricultural Development. Cornel University Press, Ithaca and London.

[10] National Population Commission (NPC, 2006). Nigeria Annual Census Bulletin, 10(2): 23-27.

[11] Olusola, Ekundayo (2017): Fish value addition and value chain in Nigeria. https://www.linkedin.com/pulse/fish-value-addition-chain-nigeria-ekundayo-olusola

[12] Ojo, E. O and Adebayo, P.F. (2012). Food Security in Nigeria: An overview. European Journal of Sustainable Development, 1, 199-222. –Open Access Library.

[13] Olaoye, O. J. and Ojebiyi, W. G. (2018). Marine Fisheries in Nigeria: A Review (Open access peer-reviewed chapter). DOI: 10.5772/intechopen.75032

[14] Onojeghuo, A.O., & Blackburn, A.G., (2011). Forest in an Ecologically Important Region: Patterns and Causes for Landscape Dynamics in the Niger Delta. Ecological Indicators, 11, 1437-1446. https://dx.doi.org/10.1016/j.ecolind.2011.03.017.

[15] Otubusin, S.O., (2011). Inaugural lecture: Fish! Fish!! Fish!!!. Department of Aquaculture and Fisheries Management, College of Environmental Resources Management, University of Agriculture, Abeokuta, Nigeria, pp: 45-55.

[16] Pearson, E.A., & Monke, E.A. (1995). Agricultural Policy in Kenya: Application of the Policy Analysis Matrix. Cornell University Press, Ithaca

[17] United Nation (2019). World Population Prospects (2019 Revision: https://worldpopulationreview.com/countries/nigeria-population/).

[18] World Trade Organization (WTO) (2017). Trade policy review report by the Secretariat, Nigeria (Pg 38).