

INFORMAL CROSS-BORDER ARTISANAL FISH TRADE IN WEST AFRICA

Mr Raymond K Ayilu

Supervisors:

Mr. Theodore O Antwi-Asare

Dr. Daniel K Twerefour



UNIVERSITY OF GHANA

Outline of Presentation

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Introduction

- Africa is well endowed with abundant fish resources.
- Coastal countries in the Western and Central Africa have predominantly engaged in fishing and post fishing for livelihood (GFA, 2009).
- In 2013, fish was reported the highest traded food commodity globally with total value of US\$130 billion, Africa account for only US\$5 billion (FAO, 2014).
- The total intra-West Africa imports of fish between 2010 to 2012 on average stood at US\$422 million representing 19.6 total global imports of fish (FAO, 2014).



- ICBT in fish is a major part of the of the intra-regional trade in fish (Tettey 1992; Tettey and Klousseh ,199; Essuaman, 1992 and Abobarin et al,1996).
- Africa's low global and intra-regional trade participation is due to a number of factors (Globefish, 2015).
- The Malabo in June 2014, stakeholders committed themselves to triple, intra-African trade in agricultural commodities (including fish) by the year 2025.



Statement of Problem

- Trading in fish has become a lucrative and viable economic venture globally which has existed for several decades.
- Low-income urban and rural household in SSA rely heavily on the informal fish markets for fish products (Gordon et al, 2011).
- However, the global trend in fish trade is changing due to WTO and FAO advocacy for a more formalise systems because of food safety issues and physio-sanitary standards.
- Major stakeholders in the sub region are striving to participate in the global fish market, leaving little attention to intra-regional trade which constitutes a major part of the regional fish trade (Gordon *et al*, 2011).



- Therefore, notwithstanding the relevance of the informal fish trade sector to many West African countries, the sector has been left largely undocumented, unregulated and unsupported (WorldFish Center, 2008).
- Apart from the inadequate attention given to the sector by key stakeholders, there has been little empirical literature to support attempts to incorporate it into agricultural trade policy in the region.
- This study, therefore, sought to contribute to the discourse by examining ICB artisanal fish trade between Ghana and her West Africa neighbours.



Research Questions

What are the key fish species and products traded?

- What are the key supply routes and flows of informal artisanal fish trade between Ghana and her neighbouring countries?
- In terms of quantity and value, how much fish is traded informally between Ghana and some neighbouring countries?
- What are the factors influencing participation in the informal cross-border fish trade?
- What factors influence profit and what is the profitability of ICB fish trade?



Objectives

- The main objective of the study is to examine the ICB artisanal fish trade in West Africa through a case study of Ghana and some neighbouring countries.

Specific Objectives

- To identify the key fish species and products traded.
- To identify the key supply routes and the flows of ICB artisanal fish trade between Ghana and her neighbouring countries.



- To estimate the volume and value of ICB fish trade between Ghana, Togo and Benin.
- To determine the factors influencing traders participation in the ICB fish trade.
- To identify factors influencing the profitability of ICB fish traders.



Literature Review

- ICBT is an activity that involves the buying and selling of goods across national boundaries in small scale and does not enjoy preferential tariff agreements (Peberdy, 2002)
- OECD, 2009 also classify Informal trade into 3 categories

Category A
Informal (unregistered) traders or firms operating entirely outside the formal economy

Category B
Formal (registered) firms fully evading trade-related regulations and duties (e.g., Avoiding official border crossing posts)

Category C
Formal (registered) firms partially evading trade-related regulations and duties by resorting to illegal practices (e.g., under-invoicing).

- ICBT in this study refers to trade that is not recorded officially by customs at the border post and does not necessarily constitute illegal trade



Theoretical Literature

School	Causal Theory
Border Effects Theory Tinbergen (1962)	The price differential determines the flow of goods across national border
Dualistic ILO World Employment Mission Kenya, 1972	Exclusion from modern economic opportunities due to two imbalances – between: <ul style="list-style-type: none"> • growth of population + growth of modern industrial employment
Structuralist School Manuel Castells and Alejandro Portes, 1989	Informality due to nature of capitalism/capitalist growth - <ul style="list-style-type: none"> • attempts by formal firms to: • reduce labour costs • increase competitiveness • process of industrialization: notably, off-shore industries + sub-contracting chains + flexible specialization
Legalist School: Hernando De Soto (1989)	Causal Theory: hostile reception, especially from the legal system, leads to informal activities and extra-legal norms
Voluntarist School: William Maloney (2004)	Causal theory: informal sector is “voluntary”: i.e., micro-entrepreneurs choose to operate informally – after weighing costs-benefits of formality vs. informality

Literature on Fish Flow			
Author	Flow	Destination	Products
Tettey (1992)	Senegal	Mali, Guinea, Congo, DR Congo, Ghana, Togo, Benin, Ivory Coast, Burkina Faso, and Nigeria	Smoked sardinella
Tall (2002)	Gambia	Guinea and Senegal	Smoked bonga
“	Gambia	Ghana	Dried shark products
“	Mali	Burkina Faso, Ivory Coast, Niger, Nigeria and Ghana	Freshwater fish
“	Sierra Leone	Guinea and Liberia	Smoked bonga and sardinella
”	Ghana	Togo and Benin.	Smoked sardinella/ anchovy and cured freshwater fish
”	Togo	Benin to Ghana	Smoked freshwater shrimp



Literature on Market Participation			
Author	Methodology	Sector	Significant Results
Laper et al (2002)	Heckman two-stage model	Livestock	Availability of capital
			Number of household members
			Number of animals owned
Mathenge et al (2002)	Heckman two-stage model	Bean farmer	Female-headed household
			Membership to a farm group
			Distance to a tarmac road
			Price
Masuku (2001)	Logistic regression	Maize farmer	Off-farm income
			Past experience
			Access to information
			Family without education
			Farm sizes
Mussema & Dawit (2002)	Heckman two-stage model	Pepper farmer	Quality of red pepper produce
			Extension services
Osebeyo & Aye (2014)	Logistic regression	Pepper farmer	Transaction cost
			Access to market information
			Market distance
			Transport cost
			Education

Literature on Profitability of Informal Traders

- The gross profit margin for ICB traders in four selected border posts in Botswana is estimated as 54.99% (Ama et al, 2013).
- It was further noted that about two million dollars is generated as profits from the exportation of goods from informal cross-border trade annually.
- In Mozambique, monthly income from informal traders is estimated 4x minimum monthly salary paid in the formal sector (Macamo, 1999).
- According to Bassey et al (2014), the gross margin for both wholesaler and retailer were N 145.83 and N 147.00 giving a total marketing margin of 28.10% and 25.7%.



Methodology

Key route, products and species

- *Collection of qualitative data* was obtained via Focus Groups Discussions and targeted interviews with key informants as well as participatory observation.
- *Secondary information and data* were drawn from FAOSTAT, WorldFish, Ghana Statistical Service documents and previous literature



Estimated Volumes and Values of ICBT for Fish

- The formulae used were as follows:

- $ATV = M N [\sum_{i=1}^n Q_d i]$

- $ADTV = [\sum_{i=1}^n Q_d i]$

- $AV = M N [\sum_{i=1}^n Q_d i] P$

Where:

N is days in a month a trader exported fish from the market;

M is the number of months in a year during which trader exported;

Q_d is the Quantity (Kg) of fish exported per market day;

J is the total number of day's data was collected;

P refers to the average price of fish per basket;

ADTV is average daily trade volume;

ATV is annual trade volume; and,

AV is annual trade value;

i is the trader index



Decision to Participate in ICBT

$$P_i = E(Y = 1/X_i) = \beta + \sum_{i=1}^n \beta X' + e.$$

$$L_i = \ln [P_i / (1 - P_i)] = Z_i = \beta + \sum_{i=1}^n \beta X' + e$$

In summary, the model was specified as follows:

$$ICBTP_i = \beta_0 + \beta_1 (MKT\ INFO)_i + \beta_2 (MFA)_i + \beta_3 (CREDIT)_i + \beta_4 (EDU)_i + \beta_5 (EXPR)_i + \beta_6 (DIST)_i + \beta_7 (HIZ)_i + \beta_8 (RCON)_i + \beta_9 (LOC)_i + \beta_{10} (COMF)_i + \beta_{11} (AGE)_i + \beta_{12} (MARITAL)_i + \beta_{13} (FAM\ HIST)_i + e_i$$

.....(1)

Dependent	Description	Unit of measurement	Sig
ICBTP	ICBT participation decision	Dummy (1=participate, 0= not)	
Independent			
MMC	Member of fish trade association	Dummy (1= yes, 0= no)	(+)
COMF	Access to mobile phone	Dummy (1= access, 0= otherwise)	(+)
EDU	Level of education	Number of years at School	(-)
EXPR	Number of years in fish trade	Years (continuous)	(+)
DIST	Distance from source to destination	Kilometers (continuous)	(-)
CREDIT	Access to credit	Dummy (1= access, 0= otherwise)	(+)
HIZ	Household size	Number of people in the house	(+/-)
RCON	Road network condition	Dummy (1= good, 0= bad)	(+)
MARITAL	Marital status of trader	Dummy (1=married, 2=unmarried)	(-)
AGE	Age	Years	(+/-)
LOC	Nearness of residence to border	Dummy (1= Yes, 0= No)	(+)
FAMHIST	Family history in fish trade	Dummy (1= yes, 0= no)	(+)
MKT INFO	Access to market information	Dummy (1= male, 0= otherwise)	(+)



Determinants and Profitability of Informal Cross-Border Fish Trade

- Profit is calculated using :

$$\Pi = R - C \dots \dots \dots (1)$$

$$C = fc + vc + cc \dots \dots \dots (2)$$

$$R = y * p \dots \dots \dots (3)$$

Where Π is the profit.

C is the costs, fc is the fixed costs, vc are variable costs and cc are the capital costs.

R is the revenue, y is the quantity of fish and p is the price per kg

$$\text{Gross profit margin} = \frac{\text{Revenue} - \text{Cost of goods sold}}{\text{Revenue}} \times 100$$



$$Y = f(X1, X2, X3, X4, \dots, X8, + e_i)$$

$$Y = \beta_0 + \beta_1 X1 + \beta_2 X2 + \beta_3 X3 + \beta_4 X4 + \beta_5 X5 + \dots + \beta_8 X8 + U$$

Where, $\beta_1 \dots \beta_8$ are coefficients to be examined and $X1 \dots X9$ are the explanatory variables

$$\text{Log}(\text{PROFIT})_i = \beta_0 + \beta_1(\text{AGE})_i + \beta_2(\text{EDU})_i + \beta_3(\text{MARITAL})_i + \beta_4(\text{FREQ})_i + \beta_5(\text{EXPR})_i + \beta_6(\text{COMF})_i + \beta_7(\text{CREDIT})_i + \beta_8(\text{MKT INFO})_i + e_i \dots \dots \dots (4)$$

Dependent	Description	Unit of measurement	Sig
Log PROFIT	PROFIT	Value (numerical)	(+)
Independent			
COMF	Access to mobile phone	Dummy (1= access, 0= otherwise)	(+)
EDU	Level of education	Number of years at School	(-)
EXPR	Number of year in the fish trade	Years (continuous)	(+)
CREDIT	Access to credit	Dummy (1= access, 0= otherwise)	(+)
MARITAL	Marital status of trader	Dummy (1=married, 2=unmarried)	(-)
AGE	Age	Years	(+/-)
FREQ	Number of trips in a year	Value (numerical)	(-)
MKT INFO	Access market information	Dummy (1= male, 0= otherwise)	(+)



Study Area



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RESULTS

Fish Species and Products traded between Ghana and neighbouring

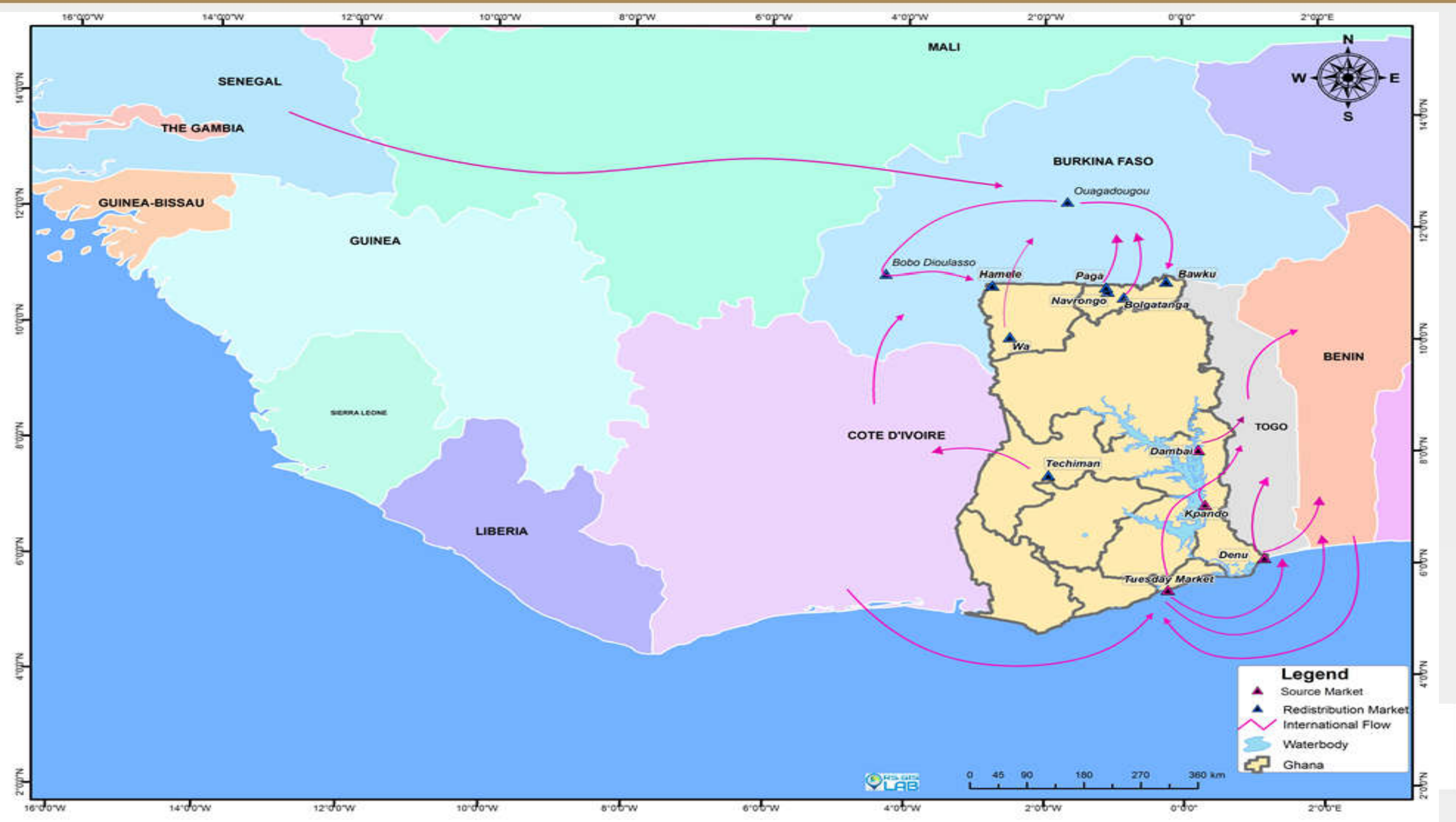
	Common English name (FAO Names)	Scientific Name	Fish product / Form in market
1	African moonfish/african lookdown	Selene dorsalis	Dried and Smoked
2	Shad, Bonga	Ethmalosa fimbriata	Smoked
3	Round Sardinella	Sardinella aurita	Smoked
4	Anchovy	Engraulis encrasicolus	Dried, Smoked
5	Atlantic bumper	Chloroscombrus chrysurus	Smoked, Dried
6	Chub mackerel	Scomber japonicas	Smoked
7	Pink shrimps	Penaeus notialis	Smoked
9	Deepwater rose shrimp	Parapaeneus longirostris	Smoked
10	Black-chinned Tilapia	Sarotherodon molanotheron	Salted Dried, Smoked
11	Catfish	Clarias gariepinus	Smoked

Sample of Fish products



Fish Trade Routes and Flows Between Ghana and Neighbouring Countries

Source markets	End market observed	Fish product / form
Denu Market	Through Aflao to Togo (Lomé)	Smoked Round Sardinella species > Smoked Anchovy > Smoked/dried African moonfish > Smoked/dried Atlantic bumper
Denu Market	Through Aflao to Northern Togo	Smoked Round Sardinella species > Smoked Anchovy Smoked/dried Atlantic bumper Smoked/dried African moonfish
Denu Market	Through Aflao to Benin	Smoked Round Sardinella species > Smoked Anchovy Smoked/dried African moonfish Smoked/dried Atlantic bumper
Dambai Market	Togo (Through Nkwanta or Kpassa) to Northern Togo	Smoked catfish
Tuesday market (Accra Chorkor)	Through Aflao to Togo (Lomé) and Benin	Smoked Round Sardinella species > Smoked Anchovy
Tuesday market (Accra Chorkor)	Through Kejaibi to Northern Togo	Smoked Round Sardinella species > Smoked Anchovy
Tuesday market (Accra Chorkor), coastal towns of western and central regions of Ghana	To Techiman (as redistribution market) through Dormaa to parts of Cote d'Ivoire	Smoked Round Sardinella species < Smoked Anchovy
Tuesday market (Accra Chorkor), coastal towns of western and central regions of Ghana	To Techiman (as redistribution market) to Burkina Faso through paga, Kulungu, Bawku, Navrongo and Hamile	Smoked Round Sardinella species < Smoked Anchovy
Ouagadougou	Through Paga border to Paga, Navrongo and Bolgatanga	Bonga/Shad (during lean fishing season in Ghana)
Ouagadougou	Through Yele-wongo and Bawku market	Bonga/Shad
Ouagadougou	Through Bobo Dioulasso to Hamile	Round Sardinella Bonga/Shad
Cote D' Ivoire	Through Elubo border to Ghana (Takoradi, Cape coast and Accra	Pink Shrimps
Benin	Through Togo (Aflao border) to Ghana (Tuesday market)	Deepwater rose shrimp



Packaging Styles for ICB Traders





Estimated Quantity and Values of Fish Products Exported From Ghana West African Neighbours					
Destination countries	Major fish Markets	Annual Quantities (tons)	Values (in GH¢)	Value (U\$)	
Togo	Tuesday	1857.618	11,814,702	3,109,132	
	Denu	1851.528	30,210,600	7,950,158	
	Dambai	1558.2	11,977,200	3,151,895	
Benin	Tuesday	261.135	2,037,600	536,210.5	
	Denu	819.21	14,709,900	3,871,026	
	Total	6,347.691	70,750,002	18,618,422	

Profitability of ICB Fish Traders

Transactions	Average value Amount (GH¢)
Revenue of exported fish products in a year	1,111,200.1
Total cost of exported fish products in a year	884,375.025
Total expenditure on all line items	45,133.65

$$\text{Gross profit margin} = \frac{1,111,200.1 - 884,375.025}{1,111,200.1} \times 100 = \frac{226,825.075}{1,111,200.1} \times 100$$

$$\text{Gross profit margin} = 20.4\%$$



Determinants of Fish Price		
Determinants	Responses (n)	Percentage (%)
Operational cost	211	22.7
Season	207	22.3
Type of fish species	201	21.6
Fish size	159	17.1
Price of other traders	98	10.5
Fish quality	46	5.0
Weight	7	0.8
Total	929	100

Determinants of Cross-Border Fish Traders' Profitability

Profit	Model (I)	Model (II)
Age	-0.041*	-0.041**
	(0.055)	(0.033)
Education (ref. primary/basic)		
Secondary/high	0.521	0.521
	(0.075)	(0.188)
No formal education	-0.058	-0.058
	(0.799)	(0.775)
Frequency of trips per year	-0.008	-0.008
	(0.548)	(0.593)
Number of Year in trade	0.072***	0.072**
	(0.000)	(0.001)
Access to credit (ref. yes)	0.329	0.330
	(0.120)	(0.091)
Access to market information (ref. yes)	0.659**	0.660**
	(0.006)	(0.020)
Access to mobile phone (ref. yes)	-0.209	-0.210
	(0.737)	(0.341)
Marital status (ref. married)	0.270	0.270
	(0.301)	(0.439)
Constant	11.763	11.763
	(0.000)	(0.000)
R-squared	0.4562	0.4562
Prob > F	0.0000	0.0000

Factors influencing traders' participation in informal cross-border fish trade

Determinants	Odds Ratio	Std. Err.	Z	P>z
Age	0.967	0.041	-0.79	0.430
Education (ref. no formal education)				
Primary/basic	5.349**	2.958	3.03	0.002
Secondary/high	1.740	1.294	0.74	0.456
Ref. no formal education				
Marital status				
Married (ref. unmarried)	0.704	0.418	-0.59	0.554
Household Sizes				
Four	0.940	0.684	-0.09	0.932
Five	0.717	0.514	-0.46	0.642
Six and above	0.809	0.579	-0.3	0.767
(ref. three)				
Market and institutional factors				
Distance (market to destination)	0.997*	0.001	-2.36	0.018
Access to credit (ref. yes)	2.063	0.922	1.62	0.105
Road network condition (ref. good)	7.052**	3.840	3.59	0.000
Nearness to border (ref. yes)	0.069**	0.032	-5.7	0.000
Member of fish trade association (ref. yes)	0.017**	0.024	-2.87	0.004
Access to communication facility (ref. yes)	0.672	0.521	-0.51	0.608
Access to market information (ref. yes)	3.959**	1.965	2.77	0.006
History of family on fish trade (ref. yes)	0.766	0.349	-0.59	0.557
Number of Year in the trade	1.050	0.036	1.44	0.149
Constant	63.183	149.344	1.75	0.079
Pseudo R ²				0.4534
Prob > chi2				0.0000
LR chi2 (18)				131.99
Hosmer-Lemeshow chi2 (8)				11.07 (p = 0.1976)

Conclusion

- There is great potential in the regional economy to increase the volume of intra-ECOWAS trade in fish among member countries
- Basic education, distance, road network condition, nearness to the border, membership of a fish traders' association and access to market information influenced traders participation.
- Informal cross-border fish traders' profits are explained by their age, the number of years in the fish trade and access to market information (5%) and access to credit (10%).
- The availability of fish to poor households in major rural and urban areas in WA is largely facilitated by informal traders



Recommendation

- Rehabilitation of infrastructure by governments/donors in the major fish markets to modern standards.
- Private and public sector investment in terms of credit facilities to increase the financial base of ICB fish traders.
- Fishery Authorities should strengthen regulatory oversight in the artisanal fishing sector.
- Adopt group certification regime to streamline activities of ICB fish traders to adhere to standards and improve data in the informal sector.



- A pursuant of the full implementation of ETLs by regional government to ensure free movement of agricultural products and people.
- Fishery Authorities and Non-Governmental Organizations' (NGOs) in the fisheries sector should assist informal fish traders obtain trade insurance packages.



THANK YOU



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