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**AGRICULTURAL INVESTMENTS, LABOR PRODUCTIVITY AND RURAL
POVERTY REDUCTION: GENDER DISPARITIES IN TOGO
BASED ON CBMS DATABASE 2018**

AUTHORS

*ATAKE ESSO-HANAM,
DANDONOUGBO YEVESSÉ,
LITAABA-AKILA DJINTA ,
KOUVIDJIN DÉDÉ ,
LIMAZIE MAZIGNADA SIKA*

UNIVERSITY OF LOME/CERFEG

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OUTLINE OF PRESENTATION

1 INTRODUCTION

2 RESEARCH QUESTIONS AND HYPOTHESES

3 METHODOLOGY

4 RESEARCH FINDINGS

5 CONCLUSION

CONTEXT AND RELEVANCE OF THE RESEARCH STUDY

1 Togolese agricultural sector contributes about 38% to the real GDP against 23% and 36%, respectively for secondary and tertiary sectors and employs 40.7% of the total labor force (FAO, 2012). Despite this significant contribution to the country's economic growth, the incidence of poverty of agricultural households was higher (72.6%, in 2015) (INSEED, 2016a).

2 Poverty reduction would depend on the types of agricultural investments made, incentives for participation in agricultural activity, and the distribution of agricultural income. Increases in farm productivity can come from increase of inputs use or investments in R & D and other policies such as education and health status of workforce, transport infrastructure, pricing policies, etc. (Fuglie & Rada, 2013).

3 Despite the government's projects and investments to improve Togolese's wellbeing, results have not met expectations yet, especially for rural population mainly agricultural.

Togo's agricultural sector is globally characterized by low input use (improved seeds), insufficiency and poor quality of rural infrastructure, rudimentary equipment, low organization of producers, low access to credit, small farms, land insecurity, etc.

CONTEXT AND RELEVANCE OF THE RESEARCH STUDY

Main research question

What are the effects of agricultural investments on rural poverty reduction by gender?

Specific research questions

This study will address the following specific research questions:

- a) What are the effects of agricultural investments on male and female farm productivity?
- b) What are the effects of farm productivity on rural poverty reduction by gender?
- c) What is the level of gender wage gap in Togo' agriculture sector

OBJECTIVES

General objectives

Analyze the effect of agricultural investments
On farmer's agricultural productivity and rural poverty reduction

Specific Objectives

- Analyze the effects of agriculture's investments on farmers agricultural productivity by gender
- Seek to understand whether agricultural productivity reduce rural poverty by gender
- Analyze the gender wage gap in the agricultural sector.

RESEARCH QUESTIONS AND HYPOTHESES

Main research

What are the gender disparities in agricultural investments, productivity and its impact or effect on poverty reduction?

Specific research questions

This study will address the following specific research questions:

- a) What are the effects of agricultural investments on male and female farm productivity?
- b) What are the effects of farm productivity on rural poverty reduction by gender?
- c) What is the level of gender wage gap in Togo' agriculture sector

Hypothesis

- Agriculture investments affects positively male farm productivity more deeply than female productivity, thus increasing the gender rural poverty gap
- Average male workers wage in the agricultural sector are much higher than that of female workers.

METHODOLOGY: Analytical Framework/Model

□ Impact of investments on agricultural productivity

Agricultural households model

- Agriculture households model developed by Urdy (1996) is used to analyze gender issues in investments and agriculture production with the context that agricultural production occurs on many plots controlled by different members of the household.

Empirical specification

Empirical specification of agricultural model:

= + +

With X is a vector of exogenous variables such as public investment that benefit households, household characteristics, farm size and others information's;
 β is land productivity of farmer;
 W represents the sex of the farmer;
 ϵ the error term.

METHODOLOGY: Analytical Framework/Model

□ Impact of farm labor productivity on rural poverty reduction

We estimate two models based on monetary index measures of poverty and household income considered as dependents variables

First specification

In the first specification, a binary consumption poverty model is used:

$$P_i^* = \beta_0 + \beta_1 \ln X_i + \beta_2 \ln yield_i + u_i, \quad P_i = 1, \text{ if } P_i^* > 0; \quad P_i = 0 \text{ otherwise,}$$

Where P_i^* is the latent unobserved poverty level of household i ;

P_i is binary poverty level response which takes 1 if the farmer is below the defined poverty line and 0 otherwise;

Second specification

The second specification takes into account the amount of farm income, as dependent variable in the following model:

$$\ln Incom_i = \gamma_0 + \gamma_j X_i + \gamma_k yield_i + u_i, \quad i = 1, 2, \dots, n$$

Where the dependent variable, $Incom_i$, is the amount of household income; and the γ are unknown parameters to be estimated.

METHODOLOGY: Analytical Framework/Model

❑ Discrimination analysis of agricultural income by gender

The decomposition methods of Blinder (1973) and Oaxaca (1973) allow to divide the gender wage gap into 2 components

Equation below show the variation in gender wage gap after a variation in gender gap in characteristics. Suh (2010) proceeds with a general decomposition of men-women wage gap with the view to solve Blinder-Oaxaca index number weaknesses;

$$\ln \quad - \ln \quad = (\quad - \quad) + (\quad - \quad) + (\quad - \quad) +$$

- ✓ With representing the “non-discriminatory wage structure”.
- ✓ The first term captures the gender wage gap caused by characteristics differences.
- ✓ The difference between men’s and women’s real and surveyed returns is highlighted by the second and the third terms..

METHODOLOGY: Sources of Data

- ❑ CBMS census data, collected in Danyi and Tsevie from 4543 households with a total of 12040 populations, in February and March 2018
- ❑ Distribution of villages and households surveyed per townships

	Zio		Danyi		Overall
	Dalavé	Gblainvié	Atigba	Elavagnon	
Total number of villages	19	13	19	26	77
Number of households surveyed	1764	830	1096	853	4543

The data were collected in 4543 farm and non-farm households in seventy-seven (77) villages in Danyi and Zio area

RESEARCH FINDINGS

Distribution of household's characteristics

		Women	Men	Total
Farmers Education Levels	None	41.85	15.10	23.67
	Primary	39.97	31.96	34.53
	Secondary	18.18	51.63	40.91
	Higher	0.00	1.31	0.89
Farmers Age	15 - 35 years old	22.30	23.69	23.24
	36 - 60 years old	58.33	61.97	60.80
	More than 60 years old	19.37	14.34	15.95
Household size	1-3 persons	77.42	64.09	68.37
	4-6 persons	21.31	32.19	28.70
	More than 6	1.28	3.72	2.93

The age distribution shows that the majority of agricultural household are between 35 and 60 years old and 75.44% of farmers have at least the primary school education level. There are also more women farmers with no education (41.85%) than men farmers (15.10%)

RESEARCH FINDINGS

Proportion of agricultural households with access to public services

Variables		Women	Men	Total
Access to drinking water and sanitation by the Farmer	No.	43.59	54.75	51.17
	Yes	56.41	45.25	48.83
Access to health facilities in the case of the Farmer	No.	43.70	51.08	48.70
	Yes	56.30	48.92	51.30
Households' access to electricity	No.	62.87	64.06	63.68
	Yes	37.13	35.94	36.32
Use of phone by head of household	No.	38.41	27.34	30.89
	Yes	61.59	72.66	69.11

About 51.17% of rural household do not have access drinking water and sanitation. Considering gender, women have more access to health care (56.57%) than men (48.82)

RESEARCH FINDINGS

Agricultural indicators

Indicators	Women	Men	Total
Proportion of farmers (by gender) with average monthly income below the guaranteed minimum wage	82.63	72.28	75.60
Proportion of farm having access to health insurance and accident insurance at work per gender	0,00	0,00	0,00
Proportion of farm workers who have access to credit per gender	3.08	3.75	3.54

Our study shows that only 3.5% of farmers in the study area have access to credit. The distribution by gender shows that 3.1% and 3.8% respectively of women and men have access to credit.

RESEARCH FINDINGS

Distribution of income by gender

Indicators	All	Women	Men	Gap
Average Income of farm, by gender (in \$US)	586.17	443.83	667.47	223.63
Average Income of non-farm, by gender (in \$US)	674.57	490.21	953.74	463.53

The average annual income is USD 586.2 and USD 674.6 respectively for farmers and non-farmers. The distribution by sex reveals that the annual income of men is higher than that of women in both groups.

RESEARCH FINDINGS

Estimation of agricultural investment on farmer productivity

Explanatory variables	Log(agricultural productivity)					
	Women		Men		All	
	coef	t-stat	coef	t-stat	coef	t-stat
irrigation	0.347	(1.20)	0.416**	(2.57)	0.393***	(2.73)
Distance to secondary school	0.483***	(3.36)	0.427***	(5.24)	0.464***	(6.56)
Distance to health center	-0.164	(-1.05)	-0.083	(-0.87)	-0.113	(-1.41)
Access to drinking water	-0.363***	(-3.10)	-0.588***	(-7.12)	-0.534***	(-7.84)
Use of mobile phone	-0.050	(-0.42)	0.283***	(3.19)	0.180**	(2.51)
selected seed	0.175	(1.07)	0.442***	(4.88)	0.385***	(4.72)
Access to electricity	0.173	(1.41)	0.148	(1.56)	0.150**	(1.97)
Household size	-0.108***	(-2.66)	-0.050**	(-2.08)	-0.062***	(-2.86)
Level of education	0.129**	(2.49)	0.069*	(1.75)	0.151***	(5.07)
Total worker	-0.039**	(-2.49)	-0.059***	(-14.00)	-0.053***	(-7.91)
Crop Area	-0.026***	(-7.04)	-0.021***	(-10.61)	-0.023***	(-12.60)
Access to Credit	-0.053	(-0.17)	-0.262	(-0.75)	-0.166	(-0.60)

RESEARCH FINDINGS

Quantile regression of agricultural investment on farmer productivity

	Quantile (0.25)			Quantile (0.5)			Quantile (0.75)		
	Women	Men	All	Women	men	All	Women	men	all
irrigat	0.699 ^{***} (2.98)	0.429 ^{***} (2.74)	0.521 ^{***} (4.17)	0.642 ^{**} (2.20)	0.082 (0.76)	0.148 ^{**} (2.56)	-0.067 (-0.50)	0.062 (0.45)	0.088 (0.68)
sem_select	0.036 (0.38)	0.258 ^{***} (5.36)	0.200 ^{***} (3.68)	-0.110 (-0.85)	0.254 ^{***} (4.41)	0.231 ^{***} (4.74)	-0.151 (-1.49)	0.213 ^{***} (3.79)	0.143 ^{***} (2.97)
nat_dist_ins	-0.472 (-1.13)	0.731 ^{**} (2.07)	0.602 ^{***} (2.58)	0.632 (0.29)	0.325 (1.54)	0.231 [*] (1.90)	-0.241 (-0.68)	0.342 ^{***} (4.49)	0.339 (0.40)
fertilizer	0.084 (0.56)	0.003 (0.04)	0.056 (0.73)	0.333 ^{***} (6.69)	0.089 ^{**} (2.10)	0.166 ^{***} (3.73)	0.570 ^{***} (6.13)	0.168 ^{***} (3.73)	0.268 ^{***} (5.66)
credit_agri	0.273 (0.76)	0.235 [*] (1.71)	0.135 (0.81)	0.005 (0.05)	-0.253 ^{***} (-4.06)	-0.093 [*] (-1.85)	0.007 (0.02)	-0.324 ^{***} (-3.51)	-0.27 ^{***} (-4.70)

RESEARCH FINDINGS

Estimation of productivity effect on poverty reduction

Explanatory variables	Poverty (0. Not poor 1. Poor)					
	Women		Men		All	
	coef	t-stat	coef	t-stat	coef	t-stat
Log (productivity)	-0.252 ^{***}	(-5.38)	-0.165 ^{***}	(-8.05)	-0.204 ^{***}	(-10.82)
Education level						
Primary	-0.669 ^{***}	(-4.68)	-0.189	(-1.38)	-0.501 ^{***}	(-5.22)
Secondary	-0.664 ^{***}	(-3.58)	-0.302 ^{**}	(-2.29)	-0.709 ^{***}	(-7.31)
Marital status						
Divorced / voeuf	0.567 ^{**}	(1.97)	0.136	(0.75)	0.408 ^{***}	(2.84)
Dependence Ratio	-0.149	(-1.12)	0.363 ^{***}	(3.57)	0.205 ^{***}	(2.58)
Select seeds	-0.101	(-0.54)	-1.028 ^{***}	(-7.54)	-0.685 ^{***}	(-6.65)
Use of fertilizer	0.186	(1.24)	0.241 ^{**}	(2.32)	0.239 ^{***}	(2.85)
Use Mobile phone	-0.159	(-1.16)	-0.665 ^{***}	(-6.67)	-0.484 ^{***}	(-6.03)

RESEARCH FINDINGS

Oaxaca decomposition of men and women farmer's income

A. Average gender differential		Coef	T-stat
Average productivity in men		12.366 ^{***}	(498.97)
Average productivity among women		11.925 ^{***}	(332.05)
The average difference in agricultural productivity by gender		0.441^{***}	(10.11)

B. aggregate decomposition	Endowment		men Structural advantage		women structural disadvantage	
	Coef	t-stat	coef	t-stat	coef	t-stat
	0.229 ^{***}	(5.58)	0.265 ^{***}	(5.70)	-0.053	(-1.19)

Considering the labor force in our study area, the estimated farm income gap between men and women is 44.2%. This difference is mainly due to dotation discrimination for 30.9%

CONCLUSION: KEY FINDINGS, POLICY IMPLICATIONS AND RECOMMENDATIONS

Key Findings	Recommendations
1. There are more women farmers with no education (41.85%) than men farmers (15.10%)	Nationals and rural community leaders must provide school supplies to increase the proportion of farmer attending to schools, especially encourage women to attend it
2. Farmers do not have health insurance and majority of them have no access to this insurance against natural disasters	Put in place, institutional innovations in the field of agricultural insurance such as index insurance against drought risk or natural disasters at the level of private initiatives, and encourage farmers to subscribe to them to reduce the risks to farmer's borrowers and lenders and unlock agricultural finance
3. public investments in health, education and telecommunication infrastructure improve farmers productivity	Increase public investments and encourage private investment in education, health, drinking water and irrigation infrastructure

CONCLUSION: KEY FINDINGS, POLICY IMPLICATIONS AND RECOMMENDATIONS

Key Findings	Recommendations
3. Productivity Increase due to public and private investments in rural areas reduces the number of farmers below the poverty line	Connect smallholders to dynamic new markets for high-value products that can increase their income and offer them an opportunity to reduce rural poverty more quickly
4. Farmer income gap between men and women is 44.1%. This difference is mainly due to dotation discrimination	Promote equity in the distribution of endowments to equalize opportunities for disadvantaged or excluded groups, such as women and ethnic minorities

Strategies for Institutionalization of CBMS in the Country and in the Locality

Based on the achievements of this data collection, other challenges however remain to be overcome:

- Share the results of this study with institutions in charge of the agricultural sector (Ministry of Agriculture, Livestock and Water) and development planning for the effective implementation of the recommendations
- Build capacity of local partners to use CBMS data and if possible, extend CBMS to all other cantons
- Provide local partners with tools enabling them to use CBMS data for the implementation of development projects in their locality,
- Explore opportunities for funding from other sources

THANK YOU!

(PROJECT CONTACT INFORMATION)

CENTRE DE RECHERCHE ET DE FORMATION EN ECONOMIE ET GESTION (CERFEG)

S/C FACULTY OF ECONOMICS AND MANAGEMENT (FA.SEG)

BP: 1515

TEL: (+228) 22255070

CEL: (228) 90021247

FAX: (228) 22514951

EMAIL: adagbodji@yahoo.fr

