

International Journal of Gender Studies (IJGS)

**EXAMINING SOCIO-ECONOMIC CONSTRAINTS OF
SMALLHOLDER WOMEN RICE FARMERS: A CASE STUDY
OF GARU AND TEMPANE DISTRICTS, GHANA**

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EXAMINING SOCIO-ECONOMIC CONSTRAINTS OF SMALLHOLDER WOMEN RICE FARMERS: A CASE STUDY OF GARU AND TEMPANE DISTRICTS, GHANA

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Abstract

Purpose: Past studies generally agree that gender-based socio-economic constraints in the agricultural sector negatively affect the growth of the agricultural sector in Ghana and other African countries. The government statistics showed that the Upper East Region of Ghana experienced a substantial decline in productivity, but few studies have clarified what socio-economic factors actually contributed to this decline. This study attempts to identify these factors and the extent to which these factors affect women farmers.

Methodology: We conducted a preliminary field survey in Ghana among farmers and government officials and identified several possible factors, such as poor access to tractor services and improved seeds, the patriarchal traditional land tenure system, insufficient credit availability, limited extension services and lower fertilizer usage. On the basis of our preliminary survey, we designed a questionnaire to gain insights into local productivity and women's roles. We selected ten farming communities in Garu and Tempane districts of the Upper East Region. Through purposive sampling, we distributed the questionnaire among 14 smallholder women rice farmers randomly from each community (a total of 140 respondents). We obtained valid answers from all.

Findings: The results showed that women rice farmers identified the following factors that had inhibited their production activities: obtaining credit from financial institutions (95%), the limited availability of extension services (85%), the high cost of fertilizer (78%), poor accessibility to certified seeds (74%), patriarchal land tenure system (63%) and poor access to tractor service (59%). We then conducted a multiple regression analysis and found that respondents' education, rice farming experience and income significantly influenced how they identified these constraints.

Unique Contribution to Theory, Practice and Policy: Agricultural productivity has been largely framed within a context of agricultural science, breeding, or food security, but not so much within a context of gender studies. In many rural areas of northern Ghana, women remain invisible, inaccessible and marginal in terms of policy support, scholarly investigation, and socio-economic equity; yet they are the very backbone of Ghana's agricultural economy. This paper offers locally ground insights as a result of long-term field experience that allowed us to reach many of these marginalized local farmers. Whereas abortion and pro-life choice can be some of the on-going concerns for women in developed countries, local farmers in our study area share with us somewhat different and unique insights on how gender equity can be interconnected to food productivity.

Keywords: *Credit Facility, Rice Production, Socio-Economic Constraints, Women Farmers*

INTRODUCTION

Gender inequality has caused a number of negative ramifications on agricultural production, especially in rural regions of Africa. In these regions, women mainly engage in hard manual labor that limits their capacity to produce food. If they have full access to modernized technologies, the world's food production can potentially increase by 20% to 30% (FAO, 2011). Globally about 43% of women engage in agriculture (FAO, 2011), but in agricultural countries like Ghana, where women contribute to 80% of its food production (Amu, 2005; Jones et al., 2017; Adom, 2015), the traditional patriarchal value system has severely limited women's ownership of land and farm machineries (Goldstein and Udry, 2008; Kwame, 2019; Marcela, 2010).

Ghana is one of a few countries in western Africa that have undergone dramatic changes to enjoy rapid industrial developments and technological advancement. The Ghanaian government has attempted to modernize farming technologies for both men and women, but it has met several regional socio-economic challenges. As of 2006, only 10% of all Ghanaian women owned land and had access to machinery (Deere and Doss, 2006). The cost of women farmers' production was higher than that of their male counterparts partly because women had to rent land and purchase fertilizer. Unlike men, women farmers did not own cattle and, therefore, could not have free access to manure as fertilizer (Anaglo et al., 2014). In rural regions of Ghana and many other African nations, addressing gender inequality by giving women more access to modern technologies can lead to higher yield and improved food security (Manfre et al., 2013).

Several studies examined gender equity issues among agricultural communities in Sub-Saharan Africa (e.g., Ghana, Ethiopia, Senegal), South Asia (e.g., India, Sri Lanka), East Asia (e.g., China, Taiwan), and South America (e.g., Peru) (Doss and Morris, 2000; Fafchamps and Quisumbing, 2002; Quisumbing and Pandolfelli, 2010; Jeyaruba et al., 2013; Malhotra et al., 2009; Razavi, 2003). These studies similarly emphasized women's disproportionate access to modern technologies and productive resources (Mason and King, 2001). A study by the World Bank (2012) placed these constraints within a global perspective and argued that poverty was greatest and quality of life lowest in societies where gender discrimination was high. In northern Ghana, where poverty and the high illiteracy rate are widespread, women do not always see the availability of technologies as a solution to their farming challenges (Nuhu and Matsui, 2019).

However, little research examined what factors prevented women from having access to technologies and land. So far, there is a lack of consensus among scholars about how gender affected an access to agricultural resources (Quisumbing and Pandolfelli, 2010; Quaye et al., 2019). Also, it is imperative to understand what women farmers in remote regions of Africa need to improve their crop productivity, given specific local socio-economic circumstances and traditional norms. This paper, therefore, examines these socio-economic constraints and their needs in northern Ghana.

METHODOLOGY

Study Area

For this research, we conducted a preliminary field survey in May 2019. The lead author worked for the Ministry of Food and Agriculture for 11 years in northern Ghana and had a number of informal discussions with local agricultural extension officials to identify potential areas for this study. After considering the importance of agriculture for women, poverty situations, and information availability, we decided to focus on Garu and Tempane districts in the Upper East Region of Ghana. These districts are the largest paddy rice producers in the Region with an area

of 1,060.91km², which is roughly the size of the city of Los Angeles. The total population of the two districts is 130,003, representing 1.2% of the Region's total population. Women represent about 52% of the population (Ghana Statistical Service, 2013). Agriculture employs 95% of these women. In particular, women play main roles in the production process (Ghana Statistical Service, 2013). These are mostly small-scale farmers with a few acres of land for cultivation. Crops like groundnut, rice, sesame, and vegetables are locally perceived as "women's crops," while millet, sorghum and cowpea are known as "men's crops." Maize and sweet potato are widely cultivated here but not gendered for some unknown reason (Ghana Statistical Service, 2013). Rice is mostly produced with traditional rain-fed methods. It is the second most cultivated cereal crop in the Region (after millet) with a total land area of 73,670 ha or 15.8% of the Region's land area (Ghana Statistical Service, 2013). Tasks related to rice planting, harvesting, processing and marketing of seeds are done predominantly by women (Manual, 2005). Rice productivity has been in a declining trend in these districts (Ghana Statistical Service, 2013).

Sampling Technique, Data Collection and Analysis

Purposive sampling was applied in selecting five communities in each district. In Garu district, we selected Songo, Tambalug, Denugu, Nomboko and Kpatua communities. In Tempene district, we selected Benwoko, Susudi, Kugasheigu, Gagbiri and Kpikpira communities. These communities share common cultural, economic and social backgrounds. The simple random sampling technique was then adopted to reach the respondents. We obtained cooperation from the Ministry of Food and Agriculture personnel in conducting a questionnaire survey. Altogether 140 smallholder women rice farmers fully and effectively participated (or 14 respondents in each community).

The questionnaire survey was conducted in August and September 2019. The questions were grouped into two sections. The first section focused on identifying socio-demographic characteristics, such as age, education, income, household size and rice farming experience. The second section aimed to identify major socio-economic constraints that hinder their production. The respondents were presented with a list of socio-economic constraints we identified in our preliminary survey.

To identify factors that influenced women farmers' perceptions of rice farming constraints, a multiple regression analysis was conducted. Multiple regression analyses were expected to help us observe if there were significant relationships between farmers' socio-demographic characteristics and these constraints. These analyses were employed because both dependent and independent variables are more than one.

RESULTS AND DISCUSSION

Socio-Demographic Characteristics of the Respondents

The first section of the questionnaire survey tried to clarify the socio-demographic characteristics of the respondents. We found that 46% of the respondents belonged to the 51-60 age bracket. This age distribution is overall similar to the Upper East Region's average age of 56 years (Ghana Statistical Service, 2013). The study area appeared to have aging problems as only 23% was younger than 35 years old. Also, in the Upper East Region, female life expectancy was 59 years old (Kpessa-Whyte, 2018). About 60% of the respondents had 10 to 29 years of rice farming experience.

In terms of educational background, which influences the way people obtain and interpret information, 71% of the respondents had completed primary education. Only about 2% of the respondents had tertiary education.

In terms of land ownership and access to farmlands, about 97% of the respondents cultivated between one and two hectares. Most of these women did not own the land but leased it. These small parcels of land make it practically impossible to secure insurance or credit to boost their farm business. Also, from our field works we learned that male landowners often allowed women to use less productive land.

Regarding the household size of the respondents, 45% had 6-10 members and another 41% had 1-5 members. This relatively large household size makes women in the study area to spend much time in taking care of children and elders other than attending to crops, which usually happens in late morning. In the study area the high temperature and dry soil increases possibility of water evaporation in the mid-day, it is ideal to give water to plants in early morning. Attending to crops only in late morning, therefore, negatively affects women's effort to increase crop productivity.

Regarding income from rice farming, which is the main source of on-farm income for the respondents, about 46% of the respondents earned US\$40-79 annually while 8% had US\$160-200. These meager profit ranges are partly due to the fact that women farmers in the study area cannot afford high yielding rice varieties, which are more marketable and fetch high market prices. To cope with the low income, farmers reduce the amount of daily food intake and use children as free laborers. It has been reported that most Ghanaian farmers, including men, survive on a meager annual per capita income of less than \$1,000 (Amedi, 2014).

Table 1: Socio-Demographic Characteristics of the Respondents

Demographic characteristics	Category	Frequency	%
Age	18-35	32	23
	36-50	44	31
	51-60	64	46
Education	No formal	100	71
	Elementary	21	15
	Secondary	15	11
	Tertiary	4	3
Farm Size (Hectare)	1-2	136	97
	>3	4	3
Farm Experience (Year)	1-9	28	20
	10-19	40	29
	20-29	44	31
	>30	28	20
Average Annual Income (US\$)	1-39	48	23
	40-79	50	46
	80-119	20	14
	120-159	12	9
	>160	10	8
Household Size (Person)	1-5	58	41
	6-10	63	45
	11-15	15	11
	>16	4	3

Source: Field survey data (2019)

Socio-Economic Constraints of the Respondents

In the second part of the questionnaire survey, we attempted to identify women rice farmers' socio-economic constraints in producing rice. From our preliminary field observation and literature review, we identified the following socio-economic constraints: credit service accessibility, extension service accessibility, fertilizer use, the application of certified seeds, land accessibility, and tractor service accessibility. Considering these constraints, the respondents were asked to make applicable choices (multiple choice question).

The result shows that 95% of the respondents identified credit services as a constraint for their rice production (Figure 1). This means that the respondents had experienced difficulties in obtaining collateral. This negatively affects the purchase of inputs to help increase yield, thereby relying on non-yielding and marginal land. Tsinigo and Behrman (2017) similarly found that about only 1% of women farmers in Ghana obtained credit from a bank due to a lack of collateral. Rashid et al. (2004) similarly found that a lack of credit access made it difficult for Bangladeshi farmers to adopt high-yielding varieties.

Another substantial challenge the respondents identified was their lack of access to technical support from the government's extension service personnel. About 85% had not received agricultural extension services. This situation was partly because male extension officers are dominant in the study area. As women in the study area are not expected to meet and talk with male strangers without husband's permission, extension workers find it culturally awkward to approach women farmers even if it is about disseminating information about more efficient farming methods. Also, in Ghana, the extension officer-farmer ratio was about 1:1500 (Okorley et al, 2019) whereas the government attempted to have the 1:500 ratio. This further explains difficulties for women to obtain professional services.

The third most identified constraint was the cost of fertilizer (78%). As mentioned above, male farmers who own livestock in the study area typically use manure to fertilize their land. Some men sell their livestock to buy synthetic fertilizer to boost rice farming. However, women farmers do not own livestock. They do not have a means of transportation to go to a market or nursery and procure fertilizer. Also, as fertilizer package normally weigh about 50kg, normally a bag of fertilizer is purchased at an agrochemical shop. These shops are usually located within a distance of about 3-5km from their farms. Therefore, without a car it is impossible for them to acquire fertilizer in the study area. In the study area, there are fertilizer dealers who give technical advice to farmers about the proper application of fertilizer, but customarily only men could receive this advice.

Another substantial challenge for the respondents was the availability of certified seeds (74%). For women farmers, improved seeds for high yield are expensive. So, they planted rice seeds, which were reproduced locally. The local rice fetches lower prices at market due largely to inferior grain qualities to imported ones (Kyei and Matsui, 2018). Only about 26% of the respondents planted improved rice varieties. According to Quisumbing and Pandolfelli (2010), women farmers in sub-Saharan Africa did not find incentive to buy new varieties as breeding research is dominated by males without consultation with female farmers. For women, seeds are often regarded as their inheritance or property. Having an outsider company to dictate seed distribution and ownership sound strange for some of them. These reasons make women farmers in Africa less likely than men to adopt improved crop varieties (Doss, 2001). However, in other countries like Bangladesh, a lack of credit access was the main reasons women farmers did not adopt high-yielding varieties (Rashid et al., 2004).

Land access or traditional tenure system, in general, was the next serious socio-economic constraint for the respondents (63%). Women in the study area do not inherit land from their parents or spouses. In the local term, women are termed as “strangers” to the land. They can only rent or lease it for a short period. Their lease can be cancelled at the discretion of male owners. This situation does not give women an incentive to invest more in farming. Kyei and Matsui (2018) similarly found that female farmers in the Upper East Region experienced lower rice productivity than their male counterparts due to insufficient labor force and lack of land access.

Next to the land access problem, 59% of the respondents identified their access to tractor service as a major socio-economic constraint. A small proportion of women farmers did receive tractor service, but only after men finished receiving such a service. In the study area, rice planting is done just before the rainy season; so, when to plough and plant affect productivity. Instead of waiting for tractor services, women rely on the use of a hoe. In addition, tractor owners tend to deal with larger farms, which are mostly run by men. Tractor owners and drivers in the study area are men, who tend to think that modernized farming is only for men. Kienzle et al. (2013) made a global survey on farm mechanization trends and found that most smallholder farmers who did not have access to tractor services in time resorted to the use of livestock. For women in our study area, however, livestock cannot be an option.

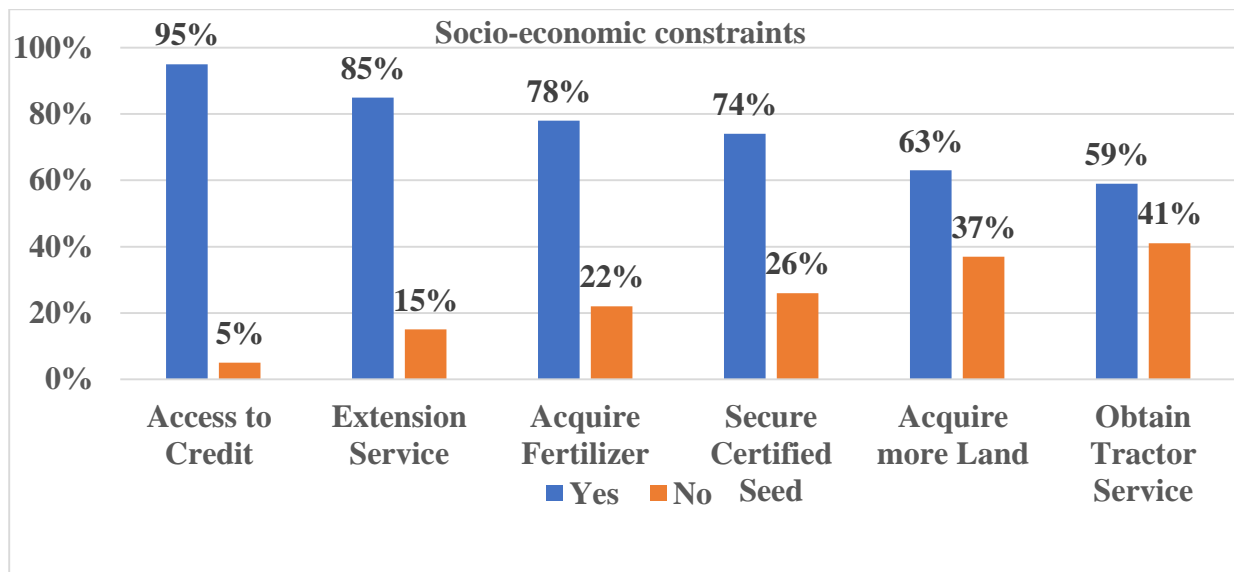


Figure 1: Socio-economic constraints of smallholder women farmers (Source: Field survey, 2019)

Relationship between Socio-demographic Characteristics and Constraints

After identifying major socio-economic constraints women rice farmers face, we performed correlation analyses to understand the relationships, if any, between respondents’ socio-demographic characteristics and their constraints (Table 2). The results indicate that education, farming experience and income were significantly associated with their constraints of tractor services, certified seeds, fertilizer and credit access.

Education was significant at 5% and positively correlated to secure certified seeds (P-value=0.024), fertilizer (P-value=0.004), tractor services (P-value = 0.002) and credit access (P-

value=0.032) (Table 2). This means that increasing the educational level of the respondents can increase their chances of having access to inputs. Perry et al. (2007) similarly found a positive correlation between formal education and higher adoption of tractor service.

Farm experience was significant at 5% and positively correlated to certified seeds (P-value=0.009), fertilizer (P-value=0.024), tractor services (P-value=0.001) and credit access (P-value=0.025) (Table 2). This means that a longer farming experience can increase their chances of having access to inputs, tractor services, and credit access. Those experienced women farmers we met in the field tried tractor services multiple times and understood the benefit of using the services. Sebopetji and Belete (2009) found that in South Africa farmers’ decision to acquire credit was positively and significantly affected by farming experience.

Income level was significant at 5% and positively correlated to securing certified seeds (P-value=0.000) and acquiring fertilizer (P-value=0.000) (Table 2). This means that an increased income gives them more chances of procuring inputs. Walton et al. (2008) similarly found that income was a very significant influencing factor for farmers in procuring farming inputs to expand farm business.

Table 1: Relationship between women farmer’s socio-demographic characteristics and their constraints

Variables	Secure certified seeds	Acquire fertilizer	Obtain tractor service	Access to credit facilities
Education	Coefficient=.194 P-value=0.024*	Coefficient=.248 P-value=.004*	Coefficient=.131 P-value=0.002*	Coefficient=-.184 P-value=0.032*
Farming experience	Coefficient=.136 P-value=0.009*	Coefficient=.194 P-value=0.024*	Coefficient=.190 P-value = 0.01*	Coefficient=.159 P-value=0.025*
Income	Coefficient=.151 P-value=0.000*	Coefficient=.186 P-value=0.000*	Coefficient=.009 P-value=0.920	Coefficient=.160 P-value=0.064

*P-value < 0.05

Source: Field survey (2019)

CONCLUSION AND RECOMMENDATIONS

This paper examined how multiple socio-economic constraints affected smallholder women rice farmers in Garu and Tempane districts of Ghana. We found that women rice farmers perceived their access to credit, extension services, fertilizer, certified seed, land and tractor service as critical constraints to their farming. The combination of these socio-economic constraints resulted into women farmer’s meager annual income from rice farming. Put this in a global perspective, our findings demonstrated some similarities to past studies. These identified and emphasized negative impacts of poor credit, input, and land access on women’s farm productivity. Our respondents faced similar gender discrimination in having access to modern technologies like tractors and improved rice varieties.

At the same time, our respondents endured locally specific constraints. The respondents had relatively large household sizes with an aging trend, making them more difficult to focus on farming activities alone. In the study area, women are expected to take care most of household

chores. These women could not own land but leased it. Male landowners have power to take away the land from these women. This situation discouraged them to invest further in rice farming. Although modernized rice farming has been promoted by the Ghanaian government and international organizations to improve food security, Garu and Tempene women were left behind from extension services and tractor services. For many women, improved seeds are not designed in a way they perceive about plant breeding. Fertilizer sales are not designed to accommodate women's limited access to transportation and the shipment of heavy fertilizer bags.

Our correlation analyses found that education, farming experience and income significantly affected the ways, in which the respondents perceived their constraints of tractor services, seeds, fertilizer and credit access. We indicated that better education and higher income for women farmers could increase their chances of acquiring farm inputs. A longer farming experience can also increase their chances of having access to inputs, tractor services, and credit access.

Finally, considering locally specific constraints the respondents had, we have a number of recommendations. Given a need to empower women farmers, it is important to look at how their local networking organizations or *susu* can play roles. Some tracts of public land can be set aside for women to engage in rice farming. This arrangement may not give women a land ownership, but a long-term lease agreement with *susu* may empower members to collectively engage in farming. *Susu* women can be trained to drive trucks and tractors so that they would not have to depend on men's benevolence. More schools can be established in local areas to boost women's skills in writing and reading. At night, adult women can be invited to take some courses to improve the necessary knowledge and skill to enhance their livelihood. A formation and strengthening of women rice farmer organizations can organize this type of adult education opportunities by sometimes inviting extension service officers. Finally, involving traditional leaders and religious leaders in discussions can eventually lead to a better awareness of the land right of women.

ACKNOWLEDGMENT

We are grateful to the Departments of Food and Agriculture (Garu and Tempene Districts) for supporting us in collecting the data for this paper. We are also grateful to the farmers who spent hours sitting down to provide answers to the questionnaire.

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