

Full Length Research Paper

Gender disparity in cassava farmers' access to agricultural productive resources in Rongo Sub County, Migori County, Kenya

Joseph Odhiambo Awuor^{1*}, Richard M. S. Mulwa² and Nancy O. Openda¹

¹Department of Applied Community Development Studies, Egerton University, P. O. Box 536-20115, Egerton, Kenya.

²Department of Crops, Horticulture and Soils, Egerton University, P. O. Box 536-20115, Egerton, Kenya.

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The disparities in access to productive resources keep on smothering agricultural growth and development, particularly in developing countries. This study was informed by the feminist political economy (FPE) framework to assessing the relationship between gender and access to agricultural productive resources among cassava farmers in Kenya. The research utilised mixed methods including the use of a survey instrument and focus group discussions. The FGDs included 30 participants. A cross-sectional survey of 92 farmers was conducted using simple random sampling and purposive sampling. The purposive sampling technique was used to select 2 out of 4 administrative wards in Rongo Sub County. Socioeconomic and gender and access to productive resources used descriptive statistics and Chi-square, respectively in SPSS Version 23. Qualitative data were analysed using NVivo. The findings showed that access to resources such as farmland, agricultural credit, agricultural extension services, and ICT, family and hired labour, and improved cassava varieties were gendered. The gendered access to productive resources cut across class, age, education and socio-cultural norms inform access to and control over resources. The study suggests that agricultural advisory services must prioritise women of low educational background and class living in patrilineal settings. This ought to be approached from a transactional gendered outlook considering men and women skewed access to agricultural productive resources to close the gender gap.

Key words: Gender disparity, feminist political ecology, cassava farmers, productive resources, Rongo Sub County.

INTRODUCTION

Women's participation in agricultural production significantly contributes to the global food security (Glazebrook et al., 2020). Their commitment to the agricultural work force is additionally higher than men's (Anderson et al., 2021; Glazebrook et al., 2020).

Achieving better results in agricultural productivity and food security is straightforwardly relative to strengthening women's capacities (Anderson et al., 2021; Akter et al., 2017). Farming is the most noteworthy supporter of livelihoods and public economies in the majority of

*Corresponding author. E-mail: odhiambojoseph230@gmail.com.

developing nations (Michels et al., 2019). Access to useful assets for farming prompts a consistent decrease in food and nourishing weakness, and destitution (Ajayi and Ross, 2017). In Kenya, agriculture's commitment to national economic growth stays pivotal. The sector helps in narrowing the gap of wide broadening joblessness attached with the arrangement of foreign exchange that assumes a critical part in the nation's development and advancement (Boone, 2019). The agricultural sector realised an incremental growth rate of % in 2017 from % in 2017 (AGRA, 2019).

For developing countries, for example, Kenya to attain undismal performance, prudent use and authority over agricultural productive resources are inevitable. Acquiring, accessing and controlling over agriculture useful resources play a significant part in the provision of better livelihood outcomes (Olayinka et al., 2020). For farming households to realisation of decent livelihood results by smallholder farmers is based on procurement, access and authority over agricultural productive assets (Lusasi and Mwaseba, 2020). Access to agricultural productive resources impacts farmer's capacity to utilise improved innovation as well as investment (Michels et al., 2019). In spite of their nonstop gendered admittance to farming useful assets, men and women definitely add to agricultural development and improvement (AGRA, 2019; Akter et al., 2017).

Gender disparities brought about by socially perceived discriminations among women and men hinder access and command over farming useful resources (Anderson et al., 2021). Women face various limitations the time spent getting to land that emanate from socio-cultural, economic and demographic barriers and, surprisingly the small portions of land have access to and control over are degraded as far as soil fertility is concerned, hence further exacerbating unstable ownership. Witinok-Huber et al. (2021) uncovered that women's admittance to farmland is gendered and discriminated against. Also, Anderson et al. (2021) confirm a disparity in admittance to farmland by women. Less than 15% of agricultural landholders are women and 85% are men worldwide (Slavchevska et al., 2021). In Africa, women own under 1% of the agricultural land (Lusasi and Mwaseba, 2020). Accordingly, the effect of land reform on rural women has been moderately immaterial in different pieces of Africa due to the social constraints on women's land rights (Akinola, 2018). In Kenya, few women own lands with secured proprietorship. Kenyan women's capacities to participate in sustainable environmental practices are continuously affected by their inconsistent admittance to agricultural productive resources such as labour, land and capital with disastrous results on agricultural productivity (Pawlak and Kalodziejczak, 2020).

Commitment of women to agricultural production continues inundate in Africa, and is projected to about 80% (Anderson et al., 2021). Uneven access and supply of agricultural useful resources is one of the contributing

variables to inadequate production and yield gaps compromising smallholder farmers' expectations (Witinok-Huber et al., 2021). However, current interventions keep on remaining impaired in tending to inconsistent access and authority over agricultural useful resources (Ankrah et al., 2020).

Upgraded agricultural growth and development are genuine only if gender gap is shut. Gender disparities influence the conveyance of agricultural productive resources (Pawlak and Kalodziejczak, 2020), yet household food security and livelihood in general, make significant human development indicators (AGRA, 2019). In any case, these development indicators are smothered by inter and intra-household gender relationships (Anderson et al., 2021). The disregarded gender disparities intensely affect people's livelihoods (Akinola, 2018). Most African nations including Kenya manoeuvre under agricultural potentials where inconsistent admittance to agricultural useful resources keeps on to be a challenge (Olayinka et al., 2020). An improvement in access to useful assets by women and an increment in their voice may be conceivable if the gender gap is shut in the agriculture sector (Alice, 2014), thereby guaranteeing food security (Pawlak and Kołodziejczak, 2018).

Ordinarily, disregarding women's equivalent access to agricultural productive resources contrarily impacts on farming productivity (Anderson et al., 2021; Akter et al., 2017; Alice, 2014). Nonetheless, in South-East Asian nations like Myanmar, Philippines, Indonesia, and Thailand, access to land, agricultural inputs and control over household income by both women and men are at equilibrium (Akter et al., 2017). This is on the grounds that, ladies differential access to agricultural productive resources is constrained by cultural norms, context and locality. Thus, the need to scrutinise the way in which these variables control women's inequivalent access to productive resources (land, labour and capital) comparative with men (Ankrah et al., 2020).

Studies (James et al., 2021; AGRA, 2019; Ajayi and Ross, 2017) conducted in Kenya have shown instances of gender disparity in access to agricultural productive resources. Cultural differences in crops grown by men and women have been sufficiently thought of (Anderson et al., 2021; Ankrah et al., 2020; Michels et al., 2019; Pawlak and Kołodziejczak, 2020; Akter et al., 2017). Cassava (*Manihot esculentum* Crantz) is an important food security crop that is cultivated with minimal inputs in Western and Coastal counties of Kenya (Ememwa et al., 2017), and a thorough comprehension of the processes associated with its production among smallholder women and men farmers, especially in Rongo Sub County in Migori County of Kenya. This is completely fitting especially Kenya when the government industriously strives to realisation of Sustainable Development Goal (SDG) 5 and Vision 2030 that focus on gender equality.

Regardless of differential access to agricultural

productive resources among men and women in the developing countries, the case is different in South East Asia where women who were not able to access productive resources, presently access equal agricultural productive resources with more command over household incomes (Akter et al., 2017). This shows that gender relations are dynamic. This situation is far very different in Kenya where gendered access to agricultural productive resources rules (Ajayi and Ross, 2017). Most studies on gender and access to agricultural productive resources absolutely fail with the current comprehension of the nuances happening in the global south and its convergence with factors that override gender.

Studies (Anderson et al., 2021; Ankrah et al., 2020; Akter et al., 2017) that have looked at gender regard it as a paired choice of being either female or male less reviewing its diversity. They have examined gender in a way its multifacetedness has come out clear. Being more intersectional in nature, Feminist Political Ecology (FPE) theory has proven fundamental in understanding how gender interconnects with cultural norms, age, class, ethnicity and social elements in shaping privilege and oppression structures (Resurreccion, 2017; Mollet and Faria, 2013).

The feminist political ecology sanctions researchers to completely comprehend the gendered politics linked to access to agricultural productive resources. Getting from Ankrah et al. (2020), the study assessed the gendered disparities associated with admittance to agricultural productive resources and utilisation through a feminist political ecology viewpoint in Migori County. The study was pointed toward assessing the way access and control over land, capital, labour, and agricultural extension services are gendered within cassava farming households in Rongo Sub County. In addition, the study researched how the socio-cultural norms, education, and social context interrelate with gender in impacting access and control of agricultural productive resources by the Feminist Political Ecology.

Feminist political ecology theory

Political ecology shapes a significant element such that essentially pursues to understand multifaceted associations between humanity and the natural built surrounding.

This is disaggregated in a synthesis of access to and authority over productive resources including their critical ramifications for sustainable livelihoods (Ankrah et al., 2020). Rocheleau (2016) added a gendered perspective to political economy in creating the idea of Feminist Political Ecology. It provides an all-inclusive view by looking at gender and its interrelation with culture, class, ethnicity and race. Feminist Political Ecology (FPE) is stood up for by Elmhirst (2015) and Luna (2018) an instrumental framework that licences an investigation of

intra-household decision making relationships, and gendered politics encircling allocation of resources. Besides, Westholm and Ostwald (2020) showed that political ecologists acknowledge the term "access" to gendered politics of allocation and control over productive resources within households. Their hypothesis explained what they named "access" by means of social character that loaned knowledge into power contrast. They exhibited that power distinction within household will dictate access to, control over as well as facilitation of other resources. Access and control involve limiting and restricting strategies. This might be directed by power disparity attributed to gender and age (Ankrah et al., 2020). This paper zeroes in on access to and control over agricultural productive resources within cassava growing households in Rongo Sub County. The FPE framework estimates that women and men own unequal rights to productive resources via their distinctive family hierarchical structures as well as gender roles (Cerrato and Cifre, 2018). FPE likewise features the possibility of a family as a multiplex unit more than a single agreeable unsophisticated unit engaged with both production and consumption (Qing, 2020). The system views women as a non-homogenous group with dichotomised interests with regard to access and control over agricultural productive resources (Cerrato and Cifre, 2018). A significant part of the FPE put a ton of features on existing variations in access and authority over useful assets from a more interconnected perspective that appreciates intra-family inconsistencies among women and men (Resurreccion, 2017). This interrelated methodology yields a more far reaching examination that goes past looking at gender as a double alternative (Ankrah et al., 2020).

MATERIALS AND METHODS

Study locale

The study was conducted in Rongo Sub County of Migori County Kenya with a population of 124,587. The climate favours agriculture with temperature ranging between 15 and 30°C and annual average rainfall of 1500 mm. As a result of favourable climate, it is considered highly agricultural sub county capable of producing substantial amount of Nation's food bank. Farmers in this sub county chiefly grow cassava and maize for food and sugarcane for cash.

Study design

The study used mixed methods approach including a cross-sectional survey questionnaire administration and qualitative approach comprising Focus Group Discussions (FGDs). A qualitative detailed cross-sectional survey design was preferred to help understand how processes resulting in access to agricultural productive resources and why gendered access to productive agricultural resources occurs. This involved FGDs with discussants. The mixed method has verified a consistent approach in

Table 1. Summary of sampling techniques, sampling process and justification.

| Sampling technique | Sampling Process | Purpose |
|------------------------|--|--|
| Purposive sampling | This was carried out in consultation with the Agricultural Extension Agent who is well knowledgeable of research participants. | The selection of study sub county and the operational wards. |
| Simple random sampling | Moreover, this was employed to select the participants after the sub county and wards had been selected. This was carried out using the lottery system in which selection was conducted without replacement. | This was performed so as to select the research participants in each of the two operational wards. |

Source: Field Work (2018).

Table 2. Summary of Focus Group Discussions (FGDs).

| Qualitative method | Number of participants women | Men | Total |
|--------------------------------|------------------------------|-----|-------|
| Focus Group Discussions (FGDs) | 15 | 15 | 30 |

Source: Field Work (2018).

understanding the complicated phenomenon, citing the reason that truth is too complicated to be singularly understood from a single-dimensional approach (Almeida, 2018).

Sampling and sampling procedure

Purposive sampling technique was first employed to choose the sub county and two (2) wards out of four (4) cassava growing wards in the Rongo Sub County in Migori County. Two (2) wards were purposively chosen since they lead in cassava farming in the sub county (Table 1). Etikan et al. (2016) defined purposive sampling as a deliberate selection of participants that best suit attributes that a researcher is interested in. A farmer population demography list was sourced from Rongo Sub County's Agriculture Department.

The sampling was conducted based on the population distribution of men and female cassava farmers in the sub county. The selection of the participants was conducted proportionate to the two wards. Based on the distribution of gender in each ward, farmers were picked through a lottery system that represented the distribution of gender.

There were 320 male and female cassava farmers according to the Ministry of Agriculture. This total population was further disaggregated into the two operational wards where farmers were selected proportionate to the two wards depending on gender distribution. A total of 92 participants from the farmer population were drawn by using the simple random sampling, that is, 46 cassava farmers comprising 28 female and 28 male from each of the two operational cassava wards (North Kamagambo and East Kamagambo) shown in Table 1. 92 participants were drawn without replacement using Anab (2017) formula. This implied that anytime a participant was chosen, that participant was not replaced in the same sample, thus the total farm households often decreased by one. Etikan et al. (2016) defined a simple random sample as one in which every individual in the populace has the same chance of being picked. This was employed so that bias is reduced. Moreover, cassava farmers in the sub county had similar socio-economic characteristics, thus, the use of simple random sampling never resulted in inconsistencies in reported findings. Therefore, each individual in the population held the same probability of being chosen.

Data collection and analysis

Questionnaire administration

Primary data was sourced by administering 92 questionnaires to cassava farmers and their response is taken. This involved information on socioeconomic characteristics, types of resources accessed and used by men and women farmers and sources of these resources. The data collection tool included a questionnaire that contained structured questions with closed and open-ended questions administered to farmers. The data collection first began with questionnaire administration, and based on the issue that arose, Focus Group Discussions (FGDs) was used to seek clarity and detailed understanding.

Focus group discussions (FGDs)

During the FGDs, participants discussed issues roundabout access to productive agricultural resources, processes resulting in access, constraints for women and men and reasons for constraints. Participants were reminded to be mindful of issues related to their own communities and not restricting themselves to personal experiences. Consensus on gendered access to productive agricultural resources was obtained in the two selected wards. The research team summarised the discussions as they understood at the end of each FGD. Etikan et al. (2016) defined an FGD as a qualitative data collection method that systematically prompts participants' information via facilitated discussions. Therefore, an FGD lends a majority decision on participant' rich experiences, beliefs as well as values supporting a particular phenomenon. 30 participants (15 women and 15 men) were further selected using a purposive sample with considerable rich knowledge on issues the study intended to establish (Table 2).

FGDs were conducted in each of the 2 study wards. This was made up of an average of thirty (30) discussants (15 males and 15 females) participating in extensive discussions on gendered access to agricultural productive resources. This was because the questionnaire prevented the researchers to understand the underlying issues in gender and access to productive agricultural resources. A purely quantitative study depended heavily on

cognitive ability and enumerators may not find it easy to understand the questionnaire and limits to specific responses to look out for (Kabir, 2016).

Data analysis

Primary data obtained through administered questionnaires were keyed into a Statistical Package for Social Sciences (SPSS) version 24 and analysed mainly through descriptive and inferential statistics. The qualitative data were subjected to content analysis. All FGDs were audio-recorded, translated into English and transcribed. All FGDs carried out were examined across summaries and transcripts to establish the main finding based on identified themes on access to productive agricultural resources. Major and sub-themes were identified after a preliminary review of transcripts by the research team. After a preliminary review of transcripts by the research team to familiarise themselves with the data, major and subthemes were identified. Content and thematic analyses were used to analyse major and subthemes from the qualitative data. The thematic analysis done was based on a realism framework of causality in which context and change agents interact to generate desirable and non-desirable outcomes (Kabir, 2016). Theme saturation was attained in the absence of new themes emerging upon review of all information classified under major and subthemes. Direct statements demonstration different thematic areas were cited in the main text. Care was taken not to expose the identities of discussants based on confidentiality.

RESULTS AND DISCUSSION

Socioeconomic characteristics

Household heads (46 female and 46 male) were interviewed ages were disaggregated into three categories with the majority (45.7%) falling with the age bracket of 36 to 55 years and 27.2% in the age brackets of 18 to 35 years and 55 years and above. Respondents that were married constituted 80.4%, 16.3% divorced, 2.2% widowed and only 1.1% single. Accordingly, the study found out that majority (59.8%) of the farmers had attained primary education, 17.4% secondary education, 12.0% tertiary education and only 10.9% no formal education. In terms of household size, the majority (71.7%) lived in households with 4 to 7 members, 16.3% 8 and above members and 12.0% lived in households with between 1 and 4 members. The majority (47.8%) had between 0 and 3 acres, 37.0% had between 4 and 7 acres and only 15.2% had 8 acres and above. Most (52.2%) of the respondents had cassava farms in the range of 0 to 3 acres, 35.9% had between 4 and 7 acres and only 12.0% had 8 acres and above (Table 3).

Gender and access to productive agricultural resources

Relationship between gender, access to land and credit

Table 4 shows the relationship between gender, access

to land and credit. The finding revealed that both men and women had access to land but the Chi-square analysis indicated a strong relationship between gender and access to land ($\chi^2 = 19.183$; $df = 1$; $p = 0.000$). This implies that access to land is gendered with more male cassava farmers having paralleled unequalled easy access to land for agriculture. Glazebrook et al. (2020), indicated gender disparity in access to land in the global south and north.

Land is primarily acquired through patrilineal inheritance in the study area. Thus, men are the heredity of legacy, henceforth have more farmland in their trusteeship. It was further observed that men are occupied in other activities for additional household income and incapable of working on farms, hence women their wives who remain at home take care of family. In a FGD, it came out clear in resolution by some male respondents that:

“Even though men own and have control over land in Rongo Sub County, they are engaged in side income-generating activities to supplement household financial needs. So, they live their wives to tend the crops. Women cannot easily have rights to land ownership. Less educated women prefer farming not at all like those with higher education” (FGD/August/2019).

This perception showed plainly that some men allow land access to their wives (women). Educated and employed women generally overlook farming since they earn salaries. Lusasi and Mwaseba (2020) showed that men owned most land while women accessed land through fathers, husbands and sons. As a rule, Slavchevska et al. (2021) demonstrated that land possession by women in sub-Saharan Africa is constrained. It was observed among women that more educated ones are more self-reliant and like to have self-property rights, hence acquire their own territory. Women with low educational level tend to depend on family land and their feelings are joined to such properties. Land possession is a marker of class. This finding concurs with Boone et al. (2019) who showed that land possession put an individual in a superior social class in Kenya. Accordingly, the more land an individual possesses, the more regard and acknowledgment (Akrah et al., 2020). Inside the latitude of the FPE framework, the findings propose that gender interrelates with class, education, socio-cultural norms and inheritance system in moulding access and use of land.

Gender and access to credit

Table 4 further reveals that more (39.1%) men had access to credit compared to only 8.7% of women. The Chi-square analysis indicated a strong significant relationship between gender and credit accessibility ($\chi^2 = 11.709$; $df = 1$; $p = 0.001$). Cassava farmers obtained

Table 3. Socioeconomic characteristics of smallholder farmers.

| Socioeconomic characteristics | Frequency | Percentage |
|--------------------------------------|------------------|-------------------|
| Age (years) | | |
| 18 - 35 | 25 | 27.2 |
| 36 - 55 | 42 | 45.7 |
| > 55 | 25 | 27.2 |
| Marital status | | |
| Single | 1 | 1.1 |
| Married | 74 | 80.4 |
| Widowed | 2 | 2.2 |
| Divorced | 15 | 16.3 |
| Level of education | | |
| Non | 10 | 10.9 |
| Primary | 55 | 59.8 |
| Secondary | 16 | 17.4 |
| Tertiary | 11 | 12.0 |
| Household size | | |
| 1 - 4 | 11 | 12.0 |
| 5 - 8 | 66 | 71.7 |
| > 8 | 15 | 16.3 |
| Total farmland (acre) | | |
| 0 - 3 | 44 | 47.8 |
| 4 - 7 | 43 | 37.0 |
| > 8 | 14 | 15.2 |
| Farmland under cassava (acre) | | |
| 0 - 3 | 48 | 52.2 |
| 4 - 7 | 33 | 35.9 |
| > 8 | 11 | 12.0 |

Table 4. Relationship between gender, access to land and credit.

| Access to (...) | Gender | Proportions (%) | | N |
|--|---------------|------------------------|-----------|----------|
| | | Yes | No | |
| Land | Female | 28.3 | 71.7 | 46 |
| | Male | 73.9 | 26.1 | 46 |
| Total ($\chi^2 = 19.183$; $df = 1$; $p = 0.000$) | | | | 92 |
| Credit | Female | 8.7 | 91.3 | 46 |
| | Male | 39.1 | 60.9 | 46 |
| Total ($\chi^2 = 11.709$ $df = 1$; $p = 0.001$) | | | | 92 |

their financial credit from local rural banks, merry-go-rounds, table banking, village savings and loan

associations (VSLAs) and self-help groups. Even though rural banks have women-targeted programmes, it is

ironical that women are still overwhelmed by high interest rates and collateral. Akter et al. (2017) indicated that women are confronted by constrained agricultural credit accessibility. In addition, an investigation by Nzomo and Muturi (2014) showed that women got a low measure of agricultural credit. In light of blended effects of formal agricultural credit on farmers' livelihoods, Njuguna et al. (2016) uncovered that agricultural credit is plagued by cultural norms, minimizing them to the foundation while offering freedoms to men to go about as underwriters. Men will in general, control in such instances where agricultural credit application proves to be fruitful (Ankrah et al., 2020). Women's direct credit accessibility minus the intervention of their spouse improved their general power within households (Fletschner and Kenney, 2014). Men practice authority over monetary resources because of socio-cultural privileges. Women's loan negotiation without the knowledge and participation of their husbands is regarded as improper, hence intra-household negotiating for use of successful contracted loan. Various ends can be drawn on the control of monetary credit by women. Women oppressed in situations where the collateral is required since men own the majority of the family resources. Women have to request their spouses offer guarantee. In occurrences where women belong to self-help groups, they take advantage of group guarantee in securing a loan. Sometimes, few women succeed to free themselves from this socio-cultural dogma and practice individual control over contracted loan (Akrah et al., 2020). The FGDs demonstrated a joint choice on the utilization of contracted credits happens in many situations notwithstanding loans being gotten for the sake of women. As a rule, ladies either counsel their husbands or settle on joint choices in any event, when they are older than their husbands. Ajayi and Ross (2017) indicated that the level of formal education increased the amount of credit accessed in Kenya. Men frequently have more command over secured loans, while few have included their spouses in the use of received loans. It came out obvious that men settle on joint choices on the utilisation of got loans. A woman referenced in an FGD that:

"In our community, it is culturally acknowledged that resources gained by women are under their significant other's control. A woman cannot get a loan and choose to use it without the knowledge of her better half (husband). It is inappropriate because it can prompt violence and compromise marriage" (FGD/August/2019).

Notwithstanding, women of higher educational levels and social classes have more opportunity in settling on loan choices. They can practice power over the utilization of got loans. In a FGD, it turned out to be obvious from a portion of the female members that:

"Loan agents incline toward endorsement of credit

applications by female elites than little educated women. However, credit specialists ought to consider the way that monetary administration doesn't need one's instructive level aside from business shrewdness" (FGD/August/2019).

The study demonstrated that formally educated women got more admittance to agricultural credit than their counterparts with informal or less formal education. In Kenya, education is an essential factor that adds to a person's class. In view of our example, women who had accomplished primary level of schooling were 59.8% and just 12.0% had tertiary education. Class is a fundamental factor inside Kenyan culture that cannot be disregarded in power exchanges and authority with the family. Taking everything into account, gender interlinks with socio factors and class interlink in forming agricultural credit availability by women. Nzomo and Muturi (2014) showed that factors such as socio-cultural, class, age, and ethnicity, intersect with gender. This gap can be shut by the FPE framework through comprehensively analysing gender instead of the mere disaggregation into being male and female (Ankrah et al., 2020).

Relationship between gender, access to agricultural extension services and ICT

Gender and access to extension agents and services

Table 5 shows the relationship between gender and access to agricultural extension services, agents, and ICT. The Chi-square analysis indicate that there is a significant relationship between agricultural extension services ($\chi^2 = 19.628$; $df = 1$; $p = 0.000$). This finding agrees with Williams and Taron (2020) and Forbang et al. (2019) who observed gender disparity in accessing agricultural extension service delivery. To a great extent, female agricultural extension agents are few in the study locale. Respondents cited comfort when extension agent of the same gender delivers extension services as supported by Williams and Taron (2020) who indicated the same scenarios in agricultural extension services. A female farmer remarked in an FGD discussion that:

"We are once in a while sometimes visited by female agricultural extension on our farms because they are not adequate. Our husbands become suspicious when male extension agents frequently visit us, despite the fact that the agents come to give us agricultural advisory services. I like when a female extension agent visits me at my home or farm" (FGD/August/2018).

In many FGDs, farmers indicated that farmers who are well-resourced access unlimited and demand-driven agricultural advisory services. This suggests that resource-poor farmers who are the majority in the study

Table 5. Relationship between gender, access to agricultural extension services and ICT.

| Access to (...) | Gender | Proportions (%) | | N |
|--|--------|-----------------|------|----|
| | | Yes | No | |
| Extension agents and services | Female | 19.6 | 80.4 | 46 |
| | Male | 65.2 | 34.8 | 46 |
| Total ($\chi^2 = 19.628$; $df = 1$; $p = 0.000$) | | | | 92 |
| ICT | Female | 26.1 | 73.9 | 46 |
| | Male | 91.3 | 8.7 | 46 |
| Total ($\chi^2 = 4.842$; $df = 1$; $p = 0.028$) | | | | 92 |

area are marginalised. Evidently, class breeds and sustains gendered admittance to agricultural extension services in such a situation, well-resourced farmers enjoy unlimited access to demand-driven agricultural extension services. Notwithstanding, women are oppressed under such conditions because of socio-cultural that straightforwardly restrict them from getting extension services. Getting an appropriate time for agricultural extension visits and interventions yonder the farm level constitutes a challenge to women since they are overflowed with domestic chores (Ankrah et al., 2020). Conversely, higher social class women enjoy admittance to agricultural extension services as they are well-resourced and afford logistical support to agricultural extension agents (Danso-Abbeam et al., 2018).

The investigation further uncovered that both women and men farmers of the higher educational class showed more interest in extension services. Some educated farmers preferred peer-to-peer extension services were more convenient due to easy access. Kwapong et al. (2020) concur with this finding by uncovering effectiveness in farmer-to-farmer extension services. Therefore, this cluster of people is not responsive to agricultural extension services. Nevertheless, the other cluster of farmers believed that they cannot go any further without agricultural extension agents, especially in the cases of Cassava Mosaic Virus Disease (CMVD), accessing improved cassava varieties and market-oriented value addition on cassava.

Thus, educated male farmers can convince their spouses to adopt agricultural extension services. Then again, educated female farmers have little ability to impact their husbands to adopt extension services due to socio-cultural norms that esteem men in patrilineal cultures which agrees with (Ankrah et al., 2020) who revealed that some men feel dominated when their wives advise them on what to do. In FGDs, a portion of educated male farmers said that:

“We are more educated than our wives, therefore, they cannot convince us to engage extension agents since it is irrelevant. We rather involve our peers in our farming affairs” (FGD/August/2018).

In conclusion, class, socio-cultural factors, and education relate with gender in shaping gendered access to useful agricultural extension services.

Gender and use of information communication and technology

Information Communication and Technology (ICT) cannot be separated from agricultural extension services. Table 5 indicates a significant relationship between gender and access to ICT ($\chi^2 = 4.842$; $df = 1$; $p = 0.028$). This suggests access to ICT is influenced by gender. This finding agrees with O'Donnell and Sweetman (2018) who confirmed gendered use of ICT. In the study locale, there is the use of ICT as the majority of cassava farmers prefer receiving extension services through radio, TV, and smartphone. Michels et al. (2019) revealed that ICT can transform gender relations and create opportunities. The use of ICT among cassava farmers adds to the existing relationship between gender and ICT in the study area. The study further revealed that farmers with higher education and better class use ICT in their farming errands. FGD participants commented that:

“Educated men and women use phones to access agricultural information, communicate with extension agents, and watch and follow agriculture-related programmes on TVs and radio unlike uneducated farmers” (FGD/August/2018).

The study further discovered that educated farmers send short text messages, contact extension agents and use WhatsApp Messaging services to share agriculture information. In reality, the majority of women, especially less educated, are unattached from using ICT in the study locale due to retrospective socio-cultural norms and time constraints as agreed by O'Donnell and Sweetman (2018) that ICT can defy traditional gender norms. This can help us understand why some traditional husbands dishearten their spouses at using modern ICTs (Ankrah et al., 2020). Rotondi et al. (2020) also discovered that men who buy phones for their spouses will in general,

Table 6. Gender and access to family, hired labour and improved cassava varieties.

| Access to (...) | Gender | Proportion (%) | | N |
|--|--------|----------------|------|----|
| | | Yes | No | |
| Family labour | Female | 71.7 | 28.3 | 46 |
| | Male | 52.2 | 47.8 | 46 |
| Total ($\chi^2 = 3.735$; $df = 1$; $p = 0.053$) | | | | 92 |
| Hired labour | Female | 13.0 | 87.0 | 46 |
| | Male | 41.3 | 58.7 | 46 |
| Total ($\chi^2 = 9.282$; $df = 1$; $p = 0.002$) | | | | 92 |
| Improved cassava cutting varieties | Female | 26.1 | 73.9 | 46 |
| | Male | 58.7 | 41.3 | 46 |
| Total ($\chi^2 = 10.015$; $df = 1$; $p = 0.002$) | | | | 92 |

control usage. Therefore, based on the FPE framework, socio-cultural norms, class, and educational level influence gender and access to Information Communication and Technology in the study area.

Access to family, hired labour and improved cassava varieties

Gender and access to family labour

Table 6 indicates a relationship between gender and access to family labour ($\chi^2 = 3.735$; $df = 1$; $p = 0.053$). The finding shows that women had higher (71.7%) access to family labour than men (52.2%) This infers that access to family labour is gendered in Rongo Sub County as opposed to Ankrah et al. (2020) who contended that access to family work force is ungendered. In the study area, parents use their children and spouses to provide labour on the farms and whoever defies this socio-cultural norm is considered deviant.

The benefits accruing from the farm is ploughed into meeting the necessities of the household members. Njuguna et al. (2016) indicated that women contribute to between 60% to 80% of the agricultural labour force in Eastern (where the study area is situated) and Central Kenya. Women have command over family labour unlike men in the study locale. Therefore, they are not restricted to decision making on family labour despite living in a patrilineal-dominated society. This finding agrees with Shibata et al. (2020) who indicated that women have the ability to make decisions on household labour. In the discussions, it was clear that women were better placed in using their family members to provide labour on the farms. This is because women have been involved in intra-household decision making on family labour. In FGD discussions, farmers remarked that:

“Women who are providers dominate decision making

regarding family labour within their households. Whoever will refuse to go to farm will not get their necessities catered for” (FGD/August/2018).

Women who are the breadwinners in their families tend to dominate decision making regarding family labour within their households. In such cases, women who have such autonomy are socially abled than their male spouses. Hence, socio-cultural norms and social class transect with gender in influencing family labour accessibility and utilisation.

Gender and access to hired labour

Table 6 shows a significant relationship between gender and access to hired labour ($\chi^2 = 10.015$; $df = 1$; $p = 0.002$) and the finding shows that men have higher (41.3%) access to hired labour than women (13.0%). Evance (2014) observed that men’s role of being providers guarantee their dominance in farm activities. This finding concurs with Qing (2020) who indicated that access to hired labour is gendered with men dominating. The finding of this study further discovered that labour disparities exist within female-headed households, especially those who are economically because they afford to employ hired labourers. A female participant indicated in an FGD that:

“We are financially handicapped women cannot pay hired labourers at their farms. Instead, we use family labour on our farm because it is affordable. However, financially well-off women are employing hired labour on their farms” (FGD/August/2018).

The findings also out that educated and working-class women use hired labour on their farms. However, resource-poor women provide family labour on their family farms. Men also tended to do more energy-demanding farm activities such as land preparation whilst

women did lighted duties such as harvesting, processing and marketing.

“We cannot afford enough energy to do heavy work like tilling the land. Our husband helps us in doing that. For the working-class women, they hire labourers to do heavy tasks on farms” (FGD/August/2018).

In conclusion, there is the relationship between gender and access to hired labour. Economic power, class and education interrelate with gender in determining hire labour accessibility in Rongo Sub County.

Gender and access to improved cassava cuttings varieties

Table 6 shows a significant relationship between gender and access to improved cassava cuttings varieties ($\chi^2 = 10.015$; $df = 1$; $p = 0.002$). More male households (58.7%) had higher access to different varieties of improved cassava cutting than female household heads (26.1%). A trustworthy explanation could be credited to the cassava value chain upgrading flagship interventions that provide farmers with different of improved cassava varieties and other farming inputs such as insecticides, herbicides and fertiliser. This study agrees with Anderson et al. (2021) who contended that women have less access to farm input such as improved seeds, fertiliser and insecticides than men. This finding disagrees with Akter et al. (2017) who revealed that women had equivalent access to and command over agricultural inputs in Southeast Asia. Since women are limited by insufficient financial capital, they are not able to purchase farming inputs. Women in male-headed households reported that they have to consult on acquisition of farming inputs. In this manner, socio-cultural norms force women to obtain the consent of their husbands in acquiring farming inputs. The FGDs revealed that educated and well-resourced women have the freedom of buying farm inputs such as improved planting materials, unlike poor-resourced and educationally disadvantaged women who rely on their husbands for buying farm inputs. In synopsis, the study observed that socio-cultural norms, class and education transect with gender in moulding farming inputs accessibility by women.

Conclusion

The findings showed that access to land, credit, agricultural extension agents and services, improved cassava cuttings, family and hired labour and agricultural information are gendered and largely favour men. Gender and access to productive agricultural resources under study had a significant relationship. The gendered relationships observed intersect with education, class, age and socio-cultural norms in influencing access to and

control over agricultural productive resources. In spite of being generally underprivileged in access to and control over productive agricultural resources, less educated women in patrilineal cultures are more marginalised than their fellow educated women. Therefore, agricultural development projects which aim to address disparities in access to and control over productive agricultural resources in Kenya must be informed by women's experiences within the distinctive class, age, education and cultural norms so as to be more successful. It is astounding that women and men have equal access to and control over agricultural productive resources in Southeast Asia. The FPE framework is essential in planning improvement programmes focused on attaining most looked-for outcomes. It is imperative that the use of mixed research methods in this study has shed reality and given a comprehensive understanding there is a need for the Ministry of Agriculture to strive to close the identified gaps in gendered access to agricultural extension services and information that marginalised women.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

REFERENCES

- Alliance for a Green Revolution in Africa (AGRA) (2019). Africa Agriculture Status Report: The Hidden Middle: A Quiet Revolution in the Private Sector Driving Agricultural Transformation (Issue 7). Nairobi, Kenya.
- Ajayi KF, Ross PH (2017). The Effects of Education on Financial Outcomes: Evidence from Kenya. *Journal of Economic Literature*, pp. 1: 53.
http://www.bu.edu/econ/files/2017/04/Ajayi_Effects_of_Education.pdf
- Akinola AO (2018). Women, Culture and Africa's Land Reform Agenda. *Frontiers in Psychology*, pp. 1-8.
<https://doi.org/10.3389/fpsyg.2018.02234>
- Akter, S., Rutsaert, P., Luis, J., Htwe, N. M., San, S. S., Raharjo, B. (2017). Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Elsevier* 69(C):270-279. DOI: 10.1016/j.foodpol.2017.05.003
- Alice E (2014). 'Women Can Do What Men Can Do': The Causes and Consequences of Growing Flexibility in Gender Divisions of Labour in Kitwe, Zambia. *Journal of Southern African Studies* 40(5):981-998. doi: 10.1080/03057070.2014.946214
- Almeida F(2018). Strategies to Perform a Mixed Methods Study. *European Journal of Education Studies* 5(1):1-15.
- Anab R (2017). *Survey Sampling Theory and Applications*. Academic Press.
- Anderson CL, Travis W, Reynolds TW, Biscaye P, Patwardhan V, Schmidt C (2021). Economic Benefits of Empowering Women in Agriculture: Assumptions and Evidence. *The Journal of Development Studies* 57(2):193-208. Doi: 10.1080/00220388.2020.1769071
- Ankrah DA, Freeman CY, Afful A (2020). Gendered access to productive resources – evidence from small holder farmers in Awutu Senya West District of Ghana. *Scientific African* 10:1-12
<https://doi.org/10.1016/j.sciaf.2020.e00604>.
- Boone C, Dyzenhaus A, Manji A, Gateri CW, Ouma S, Owino JK., Gargule A, Klopp JM (2019). Land law reform in Kenya: Devolution, veto players, and the limits of an institutional fix. *African Affairs* 118(471):215-237. <https://doi.org/10.1093/afraf/ady053>

- Cerrato J, Cifre E (2018). Gender Inequality in Household Chores and Work-family Conflict. *Frontiers in Psychology* 9(2):13-30. <https://doi.org/10.3389/fpsyg.2018.01330>
- Danso-Abbeam G, Ehiakpor DS, Aidoo R (2018). Agricultural extension and its effects on farm productivity and income: insight from Northern Ghana. *Agriculture and Food Security* 7(74):22-34. <https://doi.org/10.1186/s40066-018-0225-x>
- Elmhirst R (2015). *Feminist Political Ecology* in: *Routledge Handbook of Gender and Development*. Routledge, pp. 82-90.
- Ememwa IK., Were H, Ogemah V, Obiero H, Wekesa M (2017). Effects of modified spacing arrangements, fertiliser use and legume intercrop on prevalence of cassava brown streak disease in Western Kenya. *African Journal of Agricultural Research* 12(44):3181-3188. <https://doi.org/10.5897/AJAR2017.12667>
- Etikan I, Musa SA, Alkassim RS (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistics* 5(1):1-4. doi: 10.11648/j.ajtas.20160501.11
- Fletschner D, Kenney L (2014). Rural Women's Access to Financial Services: Credit, Savings and Insurance. *Gender in Agriculture* 22(9):187-208. http://dx.doi.org/10.1007/978-94-017-8616-4_8
- Forbang LE, Amungwa F, Lengha TN (2019). Farmers perceptions of effectiveness of extension delivery approaches to Mbororo female livestock farmers in North- West Region of Cameroon. *Journal of Agricultural Extension and Rural Development* 11(3):48- 55.
- Glazebrook T, Noll S, Opoku E (2020). Gender Matters: Climate Change, Gender Bias, and Women's Farming in the Global South and North". *Agriculture* 10(7):267-276. <https://doi.org/10.3390/agriculture10070267>
- James R, Gibbs B, Whitford L., Leisher C, Konia R, Butt N (2021). Conservation and natural resource management: Where are all the women? *Oryx* 6(23):1-8. doi:10.1017/S0030605320001349
- Kabir SMS (2016). Methods of Data Collection. *International Journal of Qualitative Methods* 5(2):201-275.
- Luna F. (2018). *Globalisation, Gender and Research: Globalising Gender Bioethics*. Routledge, pp. 254-265.
- Lusasi J, Mwaseba D (2020). Gender Inequality and Symbolic Violence in Women's Access to Family Land in the Southern Highlands of Tanzania. *Land* 9(11):468. <https://doi.org/10.3390/land9110468>
- Michels M, Fecke W, Feil HJ, Musshoff O, Pigisch J, Crone (2019). Smartphone adoption and use in agriculture: empirical evidence from Germany. *Precision Agriculture* 21(12):403-425. <https://doi.org/10.1007/s11119-019-09675-5>
- Mollet S, Faria C (2013). Messing with gender in feminist political ecology. *Journal of Geoforum* 45(3):116-125. doi: 10.1016/j.geoforum.2012.10.009
- Njuguna ME, Liani ML, Beyene M, Ojiewo CO (2016). Exploration of cultural norms and practices influencing women's participation in chickpea participatory varietal selection training activities: A case study of Ada'a and Ensaro districts, Ethiopia. *Journal of Gender, Agriculture and Food Security* 1(3):40-63.
- Nzomo M, Muturi W (2014). The Effect of Types of Agricultural Credit Programmes on Productivity of Small Scale Farming Businesses in Kenya: A Survey of Kimilili Bungoma Sub County. *Journal of Economics and Sustainable Development* 5(23):1- 12.
- O'Donnell A, Sweetman C (2018). Introduction: Gender, development and ICTs. *Gender and Development* 26(2):217-229. doi: 10.1080/13552074.2018.1489952
- Olayinka O. Adegbite OO, Machethe CL (2020). Bridging the financial inclusion gender gap in smallholder agriculture in Nigeria: An untapped potential for sustainable development. *World Development* 127:104755. doi: 10.1016/j.worlddev.2019.104755.
- Pawlak K, Kołodziejczak M (2020). The Role of Agriculture in Ensuring Food Security in Developing Countries: Considerations in the Context of the Problem of Sustainable Food Production. *Sustainability* 12:5488. doi:10.3390/su12135488
- Qing S (2020). Gender role, attitude and male-female income differences in China. *The Journal of Chinese Sociology* 7(1):1-23.
- Resurreccion BP (2017). Gender and environment from 'women environment and development' to feminist political ecology. *Routledge Handbook of Gender and Development*
- Rocheleau D (2016). The Feminist Political Ecology Legacy and Beyond. *Comparative Studies in Society and History* 37(1):1-275. doi: 10.1007/978-1-137-38273-3_18
- Rotondi V, Kashyap R, Luca MP, L M, Spinelli S, Billari FC (2020). Leveraging mobile phones to attain sustainable development. *Proceedings of the National Academy of Sciences* 117(24):13413-13420. DOI: 10.1073/pnas.1909326117
- Shibata R, Cardey S, Dorward P (2020). Gendered Intra-Household Decision-Making Dynamics in Agricultural Innovation Processes: Assets, Norms and Bargaining Power. *Journal of International Development* 32(7): 1101-1125. <https://doi.org/10.1002/jid.3497>
- Slavchevska V, Doss CR, Campos APO, Brunelli C (2021). Beyond ownership: women's and men's land rights in Sub-Saharan Africa. *Oxford Development Studies* 49(1):2-22. doi: 10.1080/13600818.2020.1818714, 1(4):71-85.
- Williams FE, Taron A (2020). Demand-led extension: a gender analysis of attendance and key crops. *The Journal of Agricultural Education and Extension* 26(4):383-400. doi: 10.1080/1389224X.2020.1726778.
- Witinok-Huber R, Radil S, Sarathchandra D, Nyaplu-Daywhea C (2021). Gender, place, and agricultural extension: a mixed-methods approach to understand farmer needs in Liberia. *The Journal of Agricultural Education and Extension* 12(33):47-56. doi: 10.1080/1389224X.2021.1880453
- Westholm L, Ostwald M (2020). Food production and gender relations in multifunctional landscapes: a literature review. *Agroforestry Systems* 94:359-374. <https://doi.org/10.1007/s10457-019-00397-1>