



Generalizations linked to socio-economic roles and production constraints of cassava among smallholder farmers in Nyaribari Chache Sub County, Kisii County

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Abstract

Cassava is an important crop among countries found in sub-Saharan Africa. The rapid growing of human population possesses great pressure on arable land. This study sought to better comprehend the generalizations linked to socio-economic roles and production constraints among smallholder farmers in Nyaribari Chache Sub County, Kisii County. A household survey was carried out for collection of primary data. Ten administrative sub-locations were randomly sampled for the study. Fifteen households were randomly sampled from each sub-location to make a sample size of 150 households. Questionnaires, interviews and focused group discussions were administered to collect data on generalizations linked to socio-economic roles and production constraints among smallholder farmers in Nyaribari Chache Sub County, Kisii County. Both descriptive (frequencies and percentages) and inferential analysis (t-test) were utilized to analyze data gathered. The analyzed data was presented using tables. The study established that there was various generalization on cassava which influenced its production, cassava vegetable crop had a variety of roles and also cassava production experienced various constraints among smallholder farmers in the study area. There was a statistical significance ($p < 0.05$) among variables on generalization, socio-economic roles and production constraints on cassava production. This finding will be of significance to stakeholders especially ministry of agriculture and relevant Non-Governmental Organizations to formulate policies to govern production of cassava among small scale farmers in the study area and beyond.

Keywords: generalization, production, constraints, smallholder, kisi

1. Introduction

In most countries, generalizations concerning cassava production have evolved more especially in sub-Saharan Africa [4]. Cassava is considered as a subsistence crop, cultivated by small holder farmers who plant it preferably during intercropping in order to spread the risks of crop failure, so as to optimize margin to land and labour [12]. Additionally, cassava is assumed to demand for minimal labor as compared to other crops and can also be cultivated without usage of inputs [19]. Such generalizations will have some effect on policy on cassava production, and if wrong, may have long term consequences for the success and sustainability of mediations. Notably, exhaustion of soil fertility has been pronounced as one of the most significant constraints to food security in the sub-Saharan Africa region [19]. The exponential growth in human population throughout Africa has resulted into increased demand for arable land and thus compounds the usability of the available land [15]. Conservative techniques geared towards maintaining soil nutrition (shifting cultivation, bush fallows) appear ineffective and thus farmers usually are deficient of the resources or know-how to efficiently utilize these new approaches (cattle manure, fertilizer and legumes). Subsequently, most farmers depend entirely on practises such as crop rotation to aid in maintaining crop production [20]. Most farms in sub-Saharan Africa can be categorized as smallholder in nature and are greatly diverse, varied and vibrant. Spatial soil inconsistency transversely on these areas and

farms, but also within the farms, is great due to the integral alterations in edaphic features linked to the parent materials besides location on toposequence and also the differential element, crop and water conservation [22]. Therefore, conservation approaches applicable in an area of the farm, may fail to apply on the other different sections [21]. Availability of resources differs greatly amongst farming units. Resource endowed homes may be possessing large parcels of land, vast labour and livestock as compared to disadvantaged households and thus possess a wider exposure to management alternatives. Smallholder farming approaches constitute of a great variety of both crop and livestock practises and off-farm revenue sources (unskilled labour, business, permanent employment), while production goals cuts across from strongly market oriented to completely subsistence oriented [20]. Localized crop production relies on a combination of agro-ecological conditions, market demand and food preferences, whereby market demand is highly dynamic, but food preferences may also change over time.

Cassava (*Manihot esculenta* Crantz) is considered to be a significant crop in most African farmers. Cassava serves a crucial part in sustaining food security, besides being classified as a cash crop. This crop was introduced into Africa in the 16th-18thC, although it took until the 20thC for its production to commence on as expected [10]. During the last five decades, the aggregate cassava production from Africa has almost quadrupled from 31 to 118 million tons per year [4]. Cassava is

commonly cultivated on marginal soils [4,2,10], proposes that the decrease in acreage can be attributed to reduction in soil fertility in Africa. According to the [4], the mean cassava produce in Africa seem to gradually reduce from 6 to 10 t ha⁻¹ over the past five decades. Currently, the mean African farmer produces an average of 20% less cassava per hectare as compared to the global mean of 12.2 t ha⁻¹. Nonetheless, there is a prospective for high produce in Africa [6]. However, there is scanty information concerning the different cassava production constraints.

The [4] has established three primary fundamentals for cassava which can promote it to a prosperous trade product in Africa: (i) a substantial reduction of its production expenditures; (ii) a continuous supply all through the year; and (iii) a steady improved value of cassava products. The first is geared towards enhancing effectiveness of cassava in as compared to corn and thus can be realized by boosting its yields and/or lowering labor requirements. The remaining two will demand for enhanced harvesting, post harvesting and processing techniques.

Scanty studies have provided relevant information to ascertain these generalizations about the role of cassava crop in African farming enterprises. The Collaborative Study of Cassava in Africa (COSCA) revealed that the most comprehensive data on cassava-based farming systems, but labor use and crop management aspects are poorly highlighted and the socio-economic role of cassava has not been exhaustively looked into. Among other few studies are available to confirm results of the COSCA studies are West and Central Africa based [7, 18] with none from East African countries.

Cassava is considered to be a subsistence crop, which is cultivated by resource disadvantaged and the small holder farmers who grow it preferably as an intercrop to act as a security against crop failure, while capitalizing on revenues to resource of land and labor overheads. Furthermore, it has been established that cassava needs reduced labor requirements as compared to other crops and can also be cultivated without a variety of inputs [12]. However, such broad view can have an influence on policy including project development and implementation, and if wrong, may generate long term concerns for the realization and sustainability of interventions [4]. Scanty studies provide information to substantiate these thoughtful dimensions based on the generalizations concerning socio-economic roles and management of cassava and interventions designed to improve cassava production among smallholder farmers. However, the Collaborative Study of Cassava in Africa documented a detailed report on cassava-based cropping systems, but the role and production of cassava has not been investigated comprehensively. Few other related studies are available to ascertain this report of the COSCA studies and these are from West and Central Africa [18] with none covering any of the East African countries and more especially Kenya.

2. Materials and Methods

2.1 Description of the study area

Nyaribari Chache Sub County is one of the nine sub counties

of Kisii County. The sub county constitutes of six administrative locations with a total of 17 sub-locations. The sub county has a coverage of 317.4Km² [14]. The area has temperature ranges of 10°C to 30°C. Nyaribari Chache Sub County has a population of 608,000. Nonetheless, with a population growth rate of 3.8% the population has exponentially grown over 750,000 (with 18.5% occupying urban settlement [11]). This sub county appears to be among the highly inhabited sub counties in Kenya. As a result of its ballooned population, a substantial portion of the land is utilized for farming. However, land has been apportioned between households; farmland size is small with an average being 14,000 m² [14]. Consequently, approximately, a quarter of an acre has been allocated for agricultural practises. Most farmers engage in subsistence agricultural activities with insignificant portion market disposal. The land for cash crop production is about 3,900ha while for food crop farming is roughly 12,600ha [13]. Livestock rearing is dominated by dairy and local poultry farming. Agriculture provides employment for an estimated 85% of the residents either directly or indirectly and the projected rural poverty is 32% with certain areas having 60% [13].



Source: Kisii County profile plan (12/07/2022)

Fig 1: Kisii County, Kenya, where the study was conducted



Fig 2: Kisii Sub-County Locations; Kisii County where the study was conducted

2.2 Sample size and sampling procedures

All the seventeen administrative sub-locations in Nyaribari Chache Sub County were marked distinctly on similar, small sized pieces of paper, folded and then put in a bucket. Random picking of only ten pieces of paper, one after the other to represent the six locations was done. From each of the ten randomly selected sub-locations, 15 households were then selected equidistantly along transect laid along the sub-location to give a total sample size of two hundred (150) households which were used for this study.

2.3 Data Collection

A survey with questionnaire administration on the 150 households was conducted in order to collect data on roles and production constraints of cassava in order to explore opportunities to improve the productivity and sustainability of intensifying cassava-based smallholder farming systems in Nyaribari Chache sub county, Kisii County.

2.4 Data Analysis

Data on generalization, roles and production constraints of cassava was analysed using descriptive (frequencies) and inferential statistics (t-test).

3.0 Results

3.1 Generalization on cassava among smallholder farmers

Thirty-five (23.3%) farmers indicated that cassava was a food security crop not a market crop, 29 (19.3%) indicated that cassava was a poor man's crop, 33 (22.0%) that poor farmers intercropped cassava while 28 (18.7%) and 25 (16.7%) indicated that cassava required less labor than other crops and it was grown without much inputs respectively as indicated in Table 1. There was a statistical significance ($p < 0.05$) among variables on generalization on cassava production (Appendix 1 (i b)).

Table 1: Generalization on role of cassava among smallholder farmers

Generalization	Respondents	
	Number	Percentage (%)
A food security crop not a market crop	35	23.3
A poor man's crop	29	19.3
Poor farmers intercrop cassava	33	22.0
Cassava needs minimal labor than other crops	28	18.7
Grown without inputs	25	16.7
Total	150	100

3.2 Socio-economic roles of cassava among smallholder farmers

Most respondents, 50 (33.3%) indicated that cassava was of a food value, 34 (22.7%) cassava extracts minimal nutrients from the soil, 25 (16.7%) that cassava aided in soil and water conservation while 21 (14.0%) and 20 (13.3%) indicated that cassava improved soil fertility and was also sold in order to earn income as illustrated in Table 2. There was a statistical significance ($p < 0.05$) among variables on socio-economic roles of cassava (Appendix 1 (ii b)).

Table 2: Socio-economic roles of cassava among smallholder farmers

Roles	Respondents	
	Number	Percentage (%)
Food value	50	33.3
Extracts minimal nutrients from the soil	21	14.0
Aids in soil water conservation	34	22.7
Improves soil fertility	25	16.7
Sold to earn income	20	13.3
Total	150	100

3.3 Cassava Production Constraints among Smallholder Farmers

Twenty four (16.0%) of the farmers indicated that competition from other crops especially food crops was a constraint in cassava production, small land sizes was supported by 20 (13.3%) of the respondents, 19 (12.7%) indicated that lack of dependable market was a constraint, farmers' attitude was supported by 18 (12.0%) of the respondents, 17 (11.3%) of the respondents indicated that low farmer income was a constraint, 15 (10.0%) of the respondents indicated that farmers' tastes and preferences was a constraint while 13 (8.7%), 10 (6.7%) and 13 (8.7%) indicated that poor soil nutrition, pests and diseases and also lack of extension knowledge were constraints which affected cassava production as illustrated in Table 3. There was a statistical significance ($p < 0.05$) among variables on cassava production constraints (Appendix 1 (iii b)).

Table 3: Cassava production constraints among smallholder farmers

Production constraints	Frequency	Percentage (%)
Poor soil nutrition	13	8.7
Pests and diseases	10	6.7
Lack of extension knowledge	13	8.7
Competition from other food crops	24	16.0
Low farmer income	17	11.3
Small land sizes	20	13.3
Farmer attitude	18	12.0
Famer tastes and preferences	15	10.0
Lack of dependable cassava market	19	12.7
Total	150	100

4. Summary of the findings

4.1 Generalization on cassava among smallholder farmers

Most farmers indicated that there were generalization concerning production. They considered cassava as a food security crop not a market crop, cassava was a poor man's crop that poor farmers intercropped cassava and also that cassava required less labor than other crops and it was grown without much inputs.

4.2 Socio-economic Roles of Cassava among Smallholder Farmers

Farmers in the study area indicated that cassava was of a food value, it extracts minimal nutrients from the soil, cassava aided in soil and water conservation, cassava improved soil fertility and was also sold in order to earn income for the households.

4.3 Cassava Production Constraints among Smallholder Farmers

The farmers revealed that competition from other food crops was a constraint in cassava production. They also indicated that small land sizes, lack of dependable market was a constraint, farmers' attitude was supported, low farmer income, farmers' tastes and preferences, poor soil nutrition, pests and diseases and also lack of extension knowledge were constraints which affected cassava production among small holder farmers in the study area.

5. Discussions

5.1 Generalization on cassava production among smallholder farmers

The study established that cassava is an important food crop though not popular in Kenya households.

These findings are in line with those obtained by [6], who emphasized that the value of cassava has greatly increased in the last three decades due to increasing land pressure and farmers' perception that cassava is an important food crop. The study also established that some farmers perceived that cassava was a crop grown by poor individuals. These results are supported by those obtained by [4] and [8] that cassava is typically perceived to be grown by resource poor, small farmers since it can be cultivated using with family labor and basic inputs only and show minimal production uncertainties. Further the study established that production of cassava can be achieved without inputs as supported by [16].

5.2 Socio-economic roles of cassava among smallholder farmers

The study established that cassava was regarded to have a variety of roles such as serving as food value, aiding in soil and water conservation, sold to earn income as supported by [1]. Further, these findings are in line with those obtained by [3] who found out that cultivation of cassava as an intercrop improves soil fertility and therefore used cassava 'to rest the soil.

5.3 Cassava production constraints among smallholder farmers

Production of cassava like any other vegetable crop is prone to a variety of challenges. The study established that pests and diseases, lack of extension knowledge, competition from other food, small land sizes, farmer attitude, farmer tastes and preferences and lack of dependable cassava market among other constraints influenced cassava production among the studied farmers. These findings are in agreement to those obtained by [9] and [17] who affirmed that farmers' knowledge, tastes and preferences influenced production of any given vegetable crop.

6. Conclusion

There was various generalization on cassava which influenced its production among smallholder farmers.

Cassava vegetable crop was established to have a variety of socio-economic roles among smallholder farmers in the study area.

Cassava production among smallholder farmers experienced various constraints in the study area.

7. Recommendations

The ministry of agriculture and relevant NGOs to formulate policies to govern production of cassava among small scale farmers.

The ministry of agriculture through extension personnel to sensitize farmers on cassava production and on how to address its production challenges.

Conflict of interest

"The author(s) declare(s) that there is no conflict of interest."

There was no role of the funding sponsors in the design of the study; in the collection, analyses or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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