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Article in *African Journal of Food, Agriculture, Nutrition and Development* · October 2024

DOI: 10.18697/ajfand.134.24250

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Date	Submitted	Accepted	Published
	24 th April 2023	6 st August 2024	4 th October 2024

CONCEPTUALIZING INTRA-HOUSEHOLD GENDER ROLES AND POWER DYNAMICS WITHIN THE CASSAVA FOOD VALUE CHAINS: LESSONS FROM QUALITATIVE EVIDENCE AMONG TANZANIAN SMALLHOLDER FARMERS

Masamha B^{1,3*}, Uzokwe VNE² and V Thebe³



Blessing Masamha

*Corresponding author email: BMasamha@hsrc.ac.za or blemasamha@gmail.com
ORCID: <https://orcid.org/0000-0003-1187-8938>

¹Human Sciences Research Council (HSRC), Africa Institute of South Africa (AISA), 134 Pretorius Street, Pretoria, Gauteng, South Africa

²International Institute of Tropical Agriculture (IITA), East Africa Regional Hub, Plot No. 25, Mikocheni Light Industry Area, Mwenge-Coca Cola Road, Mikocheni B. P. O. Box 34441, Dar es Salaam, Tanzania

³University of Pretoria, Department of Anthropology, Archaeology & Development Studies (DAADS), P Bag X20, Hatfield, Pretoria, Gauteng, South Africa



ABSTRACT

Most subsistence crops that fall in low-value chains, such as cassava, are controlled mainly by women; hence, intra-household gender roles and power dynamics are complex and depend on socio-economic and cultural contexts. Cassava food value chains contribute to the immediate food and income household needs of marginalized and vulnerable rural communities where agriculture is a significant livelihood. However, few studies have explicitly documented how perceived low-value agricultural commodity value chains transform intra-household social relations and resource ownership, benefit sharing, and how, in turn, these value chains are affected by these micro-level processes. The primary objective in designing this framework was to highlight the importance of gendered interactions at the microscale through an analysis of the changing roles, responsibilities, and bargaining power of women and men within the cassava value chains at the household level. A cross-sectional survey involving focus group discussions, in-depth interviews, and an ethnographic approach was undertaken using repeated household visits during data collection. Qualitative data analysis used content analysis to identify key themes from focus group discussions about intra-household gender power dynamics. The framework was derived from analyzing the empirical findings from Tanzania's smallholder farming sector underpinned by the Colfer and Minarchek framework. The findings refute the assumption of unitary household preferences along the gender axis, given the intricate relationships in the multi-sectoral smallholder farming space. By emphasizing intra-household gender power dynamics, the framework helps to identify gender inequalities emanating from skewed resource ownership, limited women participation, unequal benefit sharing, and power relations within the cassava food value chain. The study recommends policy shifts for women to own productive resources such as land, reduced export taxes, access to finance, and rewarding markets for cassava value chain actors. This study resonates with global and regional policy initiatives such as the Sustainable Development Goals (SDGs) and the Agenda 2063: Africa We Want in enhancing gender equality, reducing poverty, and ensuring food and nutrition security. The framework will facilitate the development of gender-sensitive intervention programs for upgrading and strengthening women's participation in cassava food value chains.

Key words: Cassava value chain, women, household, conceptual framework, gender



INTRODUCTION

The importance and value of cassava to household food and income provision cannot be overemphasized, as similarly echoed by Gengenbach *et al.* [1], who traced it back to the pre-colonial times when the Portuguese colonizers emphasized cassava's dietary and market value, claiming its commercialization potential as a feminine "subsistence" crop. In recent years, the increasing agricultural commercialization often contributed to women losing control of farm production and revenues, sometimes with adverse marginal effects on household nutrition [2]. As postulated by Njuki *et al.* [3], most of the subsistence crops that fall in the category of low-value chains, such as cassava, are under the sphere of women's control; hence, gender division is usually complex and depends on intra-household as well as socio-cultural and economic context. However, this area has not been adequately explored, as reported by Dunaway [4], who argued that less than 50% of articles focusing on the household level, especially those entailing analyses of agricultural commodity value chains, refer to the terms: 'women,' 'female,' or 'gender inequality,' thereby revealing that there has been a limited analytical focus on gender differences within households. A key challenge for enhancing the well-being of smallholder farmers engaged in cassava cultivation entails improving the household-level positions of women and men within the cassava value chain [5]. This is similarly reported by Donkor *et al.* [6], who argue that gender gaps in agrifood value chains manifest in differential access to and control of productive resources, upgrading activities, market participation, farm productivity, and food security among women and men. Therefore, it is imperative to develop a framework for integrating women in cassava food value chains, one of the main staple tubers in Tanzania, Central, and West Africa.

Empirical evidence indicates that despite women's considerable contributions to cassava food value chains, through the arduous burdens of planting, weeding, harvesting, and processing, they are often marginalized in productive resource ownership Masamha *et al.* [7], decision-making associated with production, and income sharing from cassava sales. Within low-value chains, household-level achievements may not necessarily translate into individual welfare because interventions can work differently for women and men [3, 8, 9]. This is particularly important in developing countries such as Tanzania, where traditional low-value chains have been neglected and marginalized yet significantly contribute to household income, food, and nutrition security. These low-value chains are essential because they contribute to the immediate household needs of marginalized rural communities where agriculture is a significant livelihood. Hawkes *et al.* [10] explained that the value chain concept provides a convenient framework for



measuring some benefits between economic returns and nutrition benefits from low-value chains.

One major limitation in the body of sciences is that much greater emphasis is placed on high-value cash crops within global food value chains, which are exposed to several contextual factors that relate to the dominant roles of leading regional or international firms. Very little research has been done concerning how intra-household gender power dynamics influence gender roles, nutrition, income, health, and empowerment and how, in turn, the functioning of these value chains affects household welfare in low-value chains. The study also provides a novel holistic organizing framework for examining the linkages between men, women, policymakers, middlemen, and other actors in the cassava food value chain. The study also explores intra-household gender power dynamics in the cassava value chains as influenced by several contextual factors. Similarly, Lenjiso *et al.* [11] examined relationships between household market participation and women's intra-household power relations in Ethiopia. Specifically, this study presents a gender-focused conceptual framework that can help to identify developmental outcomes and generate hypotheses that can be tested to understand better individual and household decision-making, the control of resources, and gender-differentiated benefits accruing from participation within the cassava value chain. As expounded by Tavenner and Crane [12], gender equity has increasingly been seen as the cornerstone of successful value chain development; hence, this study fosters the development interventions pursuing innovative ways to address gender imbalances in traditional food value chains.

Gender Inequalities in food value chains

Gender inequalities constrain the ability of women to participate in efforts to enhance agricultural production and reduce the poverty and food insecurity of rural households [2]. To address this issue, development organizations have targeted women, and in recent years, they have increasingly 'mainstreamed' gender within their agricultural aid programs [13]. However, these efforts have not been systematically coordinated and lack sound conceptual grounding, especially about low-value and marginalized crops such as cassava. A gendered framework for analyzing commodity value chains enables changing relationships during different stages in the transformation of farm or agri-food system networks to be examined. Its application reveals synergies, external effects (contexts), cooperation, influences, and strategic centers within these networks, the regulation of which can strengthen value chains and possibly result in their upgrading. This conceptual framework has several policy implications regarding women's participation in low-value cassava value chains. Such policies include land ownership policy, financial inclusion, and gender-sensitive agricultural commodity marketing policies. A value chain is defined



as the full range of activities and services required to bring a product or service from conception to sale in the final market [14]. It, therefore, encompasses the entire network of actors involved in input supply, production, processing, marketing, and consumption [15]. The operations of value chain actors are influenced by contextual factors that can either facilitate or hinder their performances and have nuanced effects on households.

Much of the scholarly evidence has explored cassava food value chains, analyzing women's participation in high-value nodes such as marketing as an unproblematized binary rather than analyzing gender as a relational and intersectoral concept. Explaining these relations requires a nuanced understanding of socially constructed dynamics that have remained untheorized over decades. One of the evident conceptual weaknesses in the existing body of literature relates to the masking of power struggles and inequities within households [4]. The lack of attention among policymakers and development practitioners to intra-household gender inequities has resulted in women being treated as mere household appendages, and excluded from participation in agriculture, which affects commodity value chains. As a result, little is known about how cassava food value chains affect intra-household power dynamics between men and women. This lack of knowledge seriously affects women's access to and control of household assets and income shares. Bolwig [16] also found that the question of how participation in value chains exposes poor people to risks instead of providing income opportunities has received scant attention in the literature. Most of the existing gender-focused value chain frameworks have been constructed at the macro level, incorporating factors that do not directly impact micro-level operations, especially those occurring within traditional low-value chains such as cassava. To address this gap, a context-specific framework was developed for this study emphasizing the micro-level (household) gender dynamics because it is at this scale that people's behaviors are mainly influenced and where the most significant variation exists [17]. Few value chain studies have explicitly documented or conceptually linked the impacts of value chain activities on poverty, gender relations, and the socio-economic and cultural environment [16]. This study, therefore, seeks to address this glaring gap within cassava food value chains.

Unlike other gender-based frameworks, this conceptual model depicts the gendered dimensions of each framework element concerning existing evidence, showing the influence of household power dynamics on operations within the cassava value chain, which are influenced by these operations. Masamha *et al.* [7] noted that each element within the framework, whether a policy, climactic, political, or socio-economic effect, has a differential gendered impact. Thus, a thorough understanding of the gendered nature of the cassava value chain and its influence on livelihoods, decision-making, and women's empowerment at individual and household levels is



essential for designing effective development policies and interventions that improve their status [7]. Consequently, this paper presents a framework for examining the relationships and feedback effects between cassava-based agricultural practices, household characteristics, and their impacts on key developmental outcomes. This analysis is critical because rural development programs are increasingly expected to deliver positive outcomes relating to income, nutrition, food security, empowerment goals, and agricultural growth within the smallholder farming sector. Even relatively little is known about how these programs affect or are affected by intra-household power dynamics, the differential access of men and women, and control over assets and their consequent bargaining power within households.

The allocation of resources within households is the outcome of bargaining between members with different choices and preferences and varying degrees of power to enforce those preferences [18]. If the power to allocate resources lies with household members who maximize their utility, then an improvement in a household's economic situation may not benefit all its members. Thus, a central question of this study is under what circumstances can women and men at the household level gain benefits and be empowered within a traditional cassava food value chain?

Existing Conceptual Frameworks

Several conceptual frameworks have been proposed for conducting analyses and integrating gender dynamics within studies on agricultural commodity value chains. An example of such a framework is the Gender Dimensions Framework (GDF), which considers four dimensions: access to and control over critical productive resources (tangible and intangible), beliefs and perceptions, practices and participation, and legal frameworks. Rubin and Manfre [19] developed the Integrating Gender into Agricultural Value Chains (INGIA-VC) framework. This framework has five key dimensions: mapping men's and women's participation and beliefs along the chain, identifying factors that shape gender patterns within value chain operations, identifying gender-based constraints, assessing gender-based constraints, and measuring the degree of success of gender-focused development projects. Although this framework is deployed in mapping women's and men's participation and identifying gender-based constraints relating to the INGIA-VC dimensions, its focus is on the value chain, not the household level.

The Harvard Analytical Framework is one of the earliest frameworks that systematically considered both women and men and their different positions within a social setting. This framework is premised on the principle that allocating resources to women and men in developmental efforts makes economic sense and will lead to a more efficient development process. Data collection at the individual and household levels covers three components: an activity profile, access to and control of resources and benefits, and determining factors underpin this framework. This



study draws on the Harvard Analytical Framework because it enables an examination of household power dynamics in the micro-level context.

The Moser Gender Planning Framework, developed by Caroline Moser to link women's roles to the broader development planning process, emphasizes the technical and political aspects of integrating gendered dimensions within development. It introduces the idea of women's 'three roles' in production, reproduction, and community management and their implications for women's participation in the development process.

The Gender Analysis Matrix determines how a particular developmental intervention affects women and men [20]. The matrix was designed to foster communities' self-identification of problems and solutions. Researchers who apply this matrix analyze the project's objectives at four societal levels: women, men, household, and community, examining how it impacts women's and men's labor practices, time, resources, and other socio-cultural factors, such as changes in individuals' social roles and status.

The Women's Empowerment Framework is explicitly political and is premised on a view that women's poverty results from oppression and exploitation rather than a lack of productivity. The framework postulates five ascending levels of equality between men and women that can be achieved. However, unlike our study, which focuses on rural marginalized women at a microscale, this framework entails a macro-level focus and considers economically advantaged women.

The Keeber [21] concept of the Social Relations Framework focuses on locating the family and household within a network of social relations that connects them to the community, market, and state as applied in Cambodia's livelihoods-based food security intervention [22]. It can be used to reveal how inequalities, including those relating to gender, are created and reproduced because of structural and institutional factors.

Whereas all these frameworks can be usefully applied in various contexts, most of them, except the Harvard Analytical Framework, do not examine how gender roles and relations at the household level affect and are, in turn, transformed by the operations of cassava value chains. Specifically, they do not consider how commodity value chains affect the gender roles and social behaviors of household members and how, in turn, the value chain is influenced by smallholder farmers. Compared with the study, which centers on the household, the GDF framework is more applicable at the macro level. In contrast, the INGIA-VC framework does not consider the interactions and linkages of various contextual factors such as policy, climate, environment, culture, religion, and socio-economic attributes and their impacts on household members within the cassava value chain. Moreover, the



frameworks do not address how gender roles and relations within households are transformed through the operations of cassava value chains. Although the Moser Gender Planning Framework emphasizes women's roles and impacts, it does so only at the macro level.

METHODS AND PROCEDURES

Research design and data collection

A cross-sectional survey design and an ethnographic approach were adopted in this study. An ethnographic repeated household visit approach and focus group discussions and in-depth interviews were used to collect qualitative data from three regions of Tanzania: the Kigoma region (Kakonko District), Zanzibar (Unguja Island), and the Coastal region (Mkuranga District). Two focus group discussions (FGDs) were held in each study area, resulting in six FGDs for the entire study. Participants were purposively sampled with the assistance of the local agriculture extension officers' prior knowledge and experience about cassava farming, processing, transportation, and marketing among the smallholder farmers. Each FGD comprised 10-12 participants, and all-important groups of women, men, and youths were represented. An experienced moderator ensured that each group contributed substantially to the discussions by giving them a chance to speak. Each FGD lasted between one hour and thirty minutes to one hour and forty-five minutes, followed by refreshments after the discussions. Eight in-depth interviews with key informants were undertaken at the three study sites. Repeated household visits were done using an ethnographic approach to ten purposively selected cassava-producing households in the Mkuranga district over six months. Weekly unannounced visits were made to households with the assistance of the local agriculture extension officer to understand the activities and roles involving cassava food value chains. This was as a methodological triangulation to validate the data from FGDs. Content analysis was used to analyze the qualitative data, and some information was presented as quotes or used as discussion arguments.

Ethics statement

Respondents were debriefed and asked to sign consent forms before administering questionnaires and conducting FGDs. Research protocol and instruments were submitted for an ethics review conducted by the University of Pretoria Research Ethics Committee and the Tanzanian Commission of Science and Technology (COSTECH) and were approved by both institutions.

RESULTS AND DISCUSSION

Analysis

At the micro level of the household, demographics, economic and domestic roles of household members, and their gender power dynamics were qualitatively analyzed.



For our analysis, we applied the ‘gender box’ framework proposed by Colfer and Minarchek [17] in the context of their study on forest management.

The conceptual framework

Gendered demographic issues in the cassava value chain

Of the changes in household demographics, the ages of individual household members who provide labor at each node of the value chain are critical. In areas such as Mkuranga, most able-bodied younger men migrate to the nearby central city of Dar es Salaam to seek off-farm employment. The situation in Zanzibar is similar, as expressed by a quote from an elderly woman in Mkuranga:

The experience involving labor shortages is very common, especially for cassava-related activities requiring intensive manual labor. Most of our young adult men and fathers (25–40 years) migrate to the city (Dar es Salaam) to look for employment.¹

This situation compels women to provide intensive agricultural labor, irrespective of their ages and other household responsibilities. It also negatively affects cassava production because of the limited available time resulting from the competing requirements of different crops, such as bananas and rice. Limited availability of labor at the household level results in the cultivation of smaller plots of cassava, leading to reduced cassava yields and, therefore, limited or no surplus cassava available for sale. Households, thus, become food insecure, generating low-income levels. There is potential to upgrade cassava food value chains and commercialize them instead of just being for consumption purposes, as argued by Liani *et al.* [23] that for the commercialized cassava seed system to be more socially inclusive and sustainable, gender-aware approaches need to be instituted to break underlying barriers and biases that exclude women and other socially vulnerable and marginalized groups. They also postulate that within the cassava seed systems commercialization agenda, development efforts targeting creating women as cassava seed entrepreneurs should consider combining social change innovations interventions to address the inequitable norms and power relations that develop unique constraints for women [23]. In Zanzibar, women are predominant in the nodes of the cassava value chain, particularly in marketing, unlike men, who are primarily engaged in off-farm employment.

Essential domestic roles of women and men in the cassava value chain

Women’s domestic roles in the cassava value chain are primarily productive and reproductive. Across all the study sites, women were reported to have heavy work burdens, especially regarding their domestic and reproductive roles. This result

¹Interview in Mkuranga, 9 March 2016.



corroborates with Mwakanyamale *et al.* [24], who argue that women are involved in all cassava-related tasks but do not necessarily hold exclusive decision-making powers. Empirical findings from the FGDs held in Mkuranga revealed how women performed their domestic roles within their households. One of the outstanding unanimous agreements from the FGDs pointed out that women were heavily burdened with the domestic duties of cooking, enculturation of children, looking after dependents that include the elderly as well as the sick, bearing children, and performing conjugal rights to please their husbands. Table 1 illustrates the gender-disaggregated roles along the cassava food value chains among smallholder farmers in Tanzania.

As depicted in Table 1, women's roles are labor-intensive and significantly affect time budgets and remuneration. However, unlike men, who actively occupy rewarding nodes such as transportation and marketing, these roles are poorly remunerated. The differences in gender roles negatively affect women's participation since their benefits are not adequately realized. Similar results were put forward by Mwakanyamale *et al.* [24], arguing that men decide to purchase inputs and high-value assets in cassava value chains.

Women's primary domestic roles entail daily preparing household meals for their husbands, children, and dependents. Because women are responsible for planning their households' daily meals, the availability of cassava as one of the main staple food crops after maize in Tanzania affects intra-household roles and power dynamics. Women's cooking roles link them to the cassava value chain via the dietary calorific value of cassava tubers. As reported by Oey-Gardiner [25] and Hoddinot and Haddad [26], women's roles centrally entail cooking and the provision of meals for the entire household (see Table 1). Because cassava is central to household food production, women would advocate for allocating more resources for its production. Information obtained from the focus group discussion (FGDs) in Zanzibar also indicated that cooking was done both by young girls and by mature older women. In northern India, Jassal [27] has similarly reported that young girls and women are assigned household chores of cooking and caring for the children and the aged.

Women's knowledge is also critical for childcare and training. The proper enculturation of children regarding the cassava value chain depends on this knowledge possessed by women. This study also revealed the importance of women's knowledge in training children in sourcing and preparing cassava cuttings and cultivating, weeding, harvesting, and processing cassava into various food products. This finding was notably endorsed in a FGD held in Kigoma where the participating women showed samples of the foods they processed. They revealed the following information about women's knowledge during the discussion:



From a tender age, children are taught by their mothers how to prepare cassava cuttings for planting and cultivating, [performing] weeding, harvesting, and, more importantly, how to process the cassava using traditional methods. Mothers especially train young girls on how to process cassava using the conventional method of fermenting, which is popular and preferred among the elderly.²

Women's role is linked to cassava production, given that they pass on skills to children who will apply them as they grow older in cassava production. In addition, the processing methods they cultivate amongst the youth add value to the cassava sold at weekly markets and on roadsides near their homes, contributing to alternative livelihoods through income and food. The ability of elderly women to train young adults in preparing cassava cuttings has been similarly reported by Sajise [28] in Andhra Pradesh, India, where older women's knowledge is central to saving seeds and selecting planting material in agriculture. In the cassava value chain context, women are viewed as natural guardians and society's gatekeepers regarding valuable traditional cassava processing methods.

Identifiable intra-household power dynamics in the cassava value chain

Intra-household power dynamics are essential in determining the extent of women's options to become involved in the cassava value chain and their responsibilities and benefits. A similar study in Ghana on unlocking gender dynamics in food and nutrition security among cocoa household heads showed that the male-headed households had higher dietary diversity and were food secure than the female-headed cocoa households [29]. This indicates that household gender dynamics are an essential determinant of the welfare of women and societal well-being; hence, there is a need to break barriers in strategic food and commercial food value chains such as cassava. These gender dynamics also critically influence women's decision-making regarding the division of benefits from the labor they may have provided. In this context, the study focused on three key issues: the different interests of women and men, women's vulnerability to coercion, and intra-household bargaining between women and men. Women's vulnerability to coercion, and especially that imposed by men within their households, results in an inequitable distribution of productive resources, income, and other benefits that accrue within households.

This coercion that is manifested in gender-based violence has prompted efforts to ensure that women in Tanzania have rights over productive resources, such as land, through the enactment of legislation such as the Land and Village Land Act of 1999. However, women have limited access to and control over productive resources,

² FGD held in the village of Itumbiko on 21 January 2016.



especially land. There are reports in the literature on the use of herbs to 'control harsh husbands' behaviors in about 80 percent of Zimbabwean resettlement communities, signifying the importance of gender-based violence in these communities. Where women have land rights, cassava yields are expected to be high, and their vulnerability to coercion is simultaneously reduced.

Intra-household bargaining power moderated and exacerbated by cultural norms tilts the playing field favoring men within the cassava food chain. However, as women grow older, they become more empowered to make decisions within their households. The decision-making power of women within households is also greater for widows and households that are *de facto* female headed. In this case, a quotation from a FGD discussion regarding decision-making within households is presented:

Generally, men are the primary decision-makers regarding issues of productive resources. However, as women grow older, they become decision-makers as well. In cases of women being widows, divorcees, and *de facto* household heads, they are the immediate and sole decision-makers in those households.³

In the three study sites, only 20% of households were headed by women who reported they were the sole decision-makers. Most of these women were household heads who were divorced and widowed; a few of them had husbands who had migrated to the urban areas for employment. Similarly, Nemarundwe [30] reported that elderly and single women in Chivi, Zimbabwe, were most likely to express their views publicly and make their own decisions. This is a crucial factor relating to the allocation of plots, time, and limited inputs for cassava production, which has traditionally been regarded as a 'women's crop' within the cassava value chain.

Empowered women also have access to benefits derived from the cassava value chains, especially regarding income sharing. Evidence from Tanzania's Kigoma, Zanzibar, and Mkuranga regions revealed that men and women jointly control income use. The results showed that, based on applying the five domains of empowerment (5DE) index, women were empowered (0%) as the indicator of control of income use. Women were likely to have more bargaining power when external involvements enhanced their skills and confidence. This was particularly evident in Zanzibar, where women dominated the cassava marketing node, probably because they had more external influence through their membership of cooperative savings groups and Savings and Credit Cooperative Societies (SACCOS)

Only 44% of female respondents in Zanzibar reported the existence of community groups and their participation in them. In addition, the relatively high percentage of

³ FGD held in Zanzibar on 13 February 2016



women in Zanzibar who used credit for farming activities indicates that these women had better bargaining power within their households. However, increased women's income in Zanzibar did not necessarily translate into gains in household bargaining and decision-making power within households. This was mainly attributable to dominant Muslim religious norms requiring women to be highly submissive to their husbands and constraining them from making decisions relating to the use of the incomes that they generated. External influences via agricultural extension support impacted 66%, 32%, and 33% of female respondents in Zanzibar, Kigoma, and Mkuranga, respectively. This extension support affected the cassava value chain through increased yields, enhanced marketing, and skills development for women farmers. Equipped with this information, they could bargain for better cassava prices in the market.

Components of the conceptual framework

The framework's landscape is influenced by various contextual factors, namely the policy framework and government legislation, the climate and environment, the political and socio-economic contexts, and culture and gender equity. Even within the same household, these contextual factors are typically experienced differently by men and women according to their roles and responsibilities and other political, social, economic, and cultural factors. It is imperative to investigate these gender dynamics as the roles of men and women may be defined differently according to cultural norms and values. These differences have diverse effects on the functioning of cassava value chains as guided by the underlying Harvard Analytical Framework, which emphasizes defining the socio-economic roles of women and men, especially in developing countries. Moreover, the legal and policy frameworks can affect men and women differently, especially regarding the ownership of resources and the processing and marketing of cassava.

The legal and policy framework component applies especially to resources such as land, which the Harvard Analytical Framework explains as central to productive resource ownership debates. The policy and government component of the framework reveals the institutional setup and regulations that are put in place to govern agricultural activities, including land laws, marketing, and processing requirements. This element is required because land governance is a contested issue. In smallholder farming, such regulations include taxes imposed on farmers when they try to market their cassava produce across the borders of countries such as Burundi, Rwanda, and Uganda. Processed cassava is expected to meet the Tanzanian Bureau of Standards.⁴ Accordingly, farmers must pay exorbitant fees to

⁴ Every consumable product in Tanzania must be tested and approved by the Tanzanian Bureau of Standards. Farmers must pay exorbitant fees of about TZS 200 000 (equivalent to USD 1000) to undergo this process.



be accredited to sell their produce in formal markets, such as supermarkets. Such constraining measures have negatively impacted farmers' livelihoods through reduced market access and income generation. Decentralized government structures, agricultural extension support, and active and gender-inclusive farmer associations would give smallholder farmers and women a voice in the decision-making process relating to the cassava value chain [31].

Climatic and environmental conditions affect households in various ways. Changing climatic conditions induce shocks like drought, resulting in acute food shortages. The effects of these shocks on households may vary according to their gender and power dynamics. Ownership of household resources influences how men and women respond to shocks like drought. Assets owned by men are usually disposed of to meet expenses such as dowry, whereas women dispose of assets in times of difficulty, such as illnesses and food shortages. Hence, ownership of resources is a critical factor for households participating in the cassava value chain. Such phenomena affect women and men differently, with women being most affected, given their primary involvement in the preparation of meals. This finding is supported by Haggblade and Nyembe [32], who reported that women's domestic roles are mostly confined to cooking, childcare, and other household chores.

Culture and gender equity shape the domestic roles of household members and the power dynamics within households that determine decisions about production, processing, and marketing. This component also explains how the ownership of productive resources is distributed within households based on cultural values and gender-related differences. Traditional customs and norms invariably determine the ownership of resources, the domestic roles of household members, and the power dynamics within households, thereby influencing the cassava value chain. Therefore, as indicated by Meinzen-Dick *et al.* [33] and Akem and Adewole [34], it is imperative to conduct an in-depth investigation to develop a comprehensive understanding of the differences that cultural norms give rise to. Political and socio-economic environments affect operations within the cassava value chain at the household and community levels. These environments shape the distribution of resources, such as land ownership, at the community level. Women must be actively involved in political activities at all levels to influence the distribution and ownership of productive and other resources. The cassava value chain is also affected by the asset endowments of smallholder farmers, including inputs, tillage equipment, processing equipment, and modes of transport.



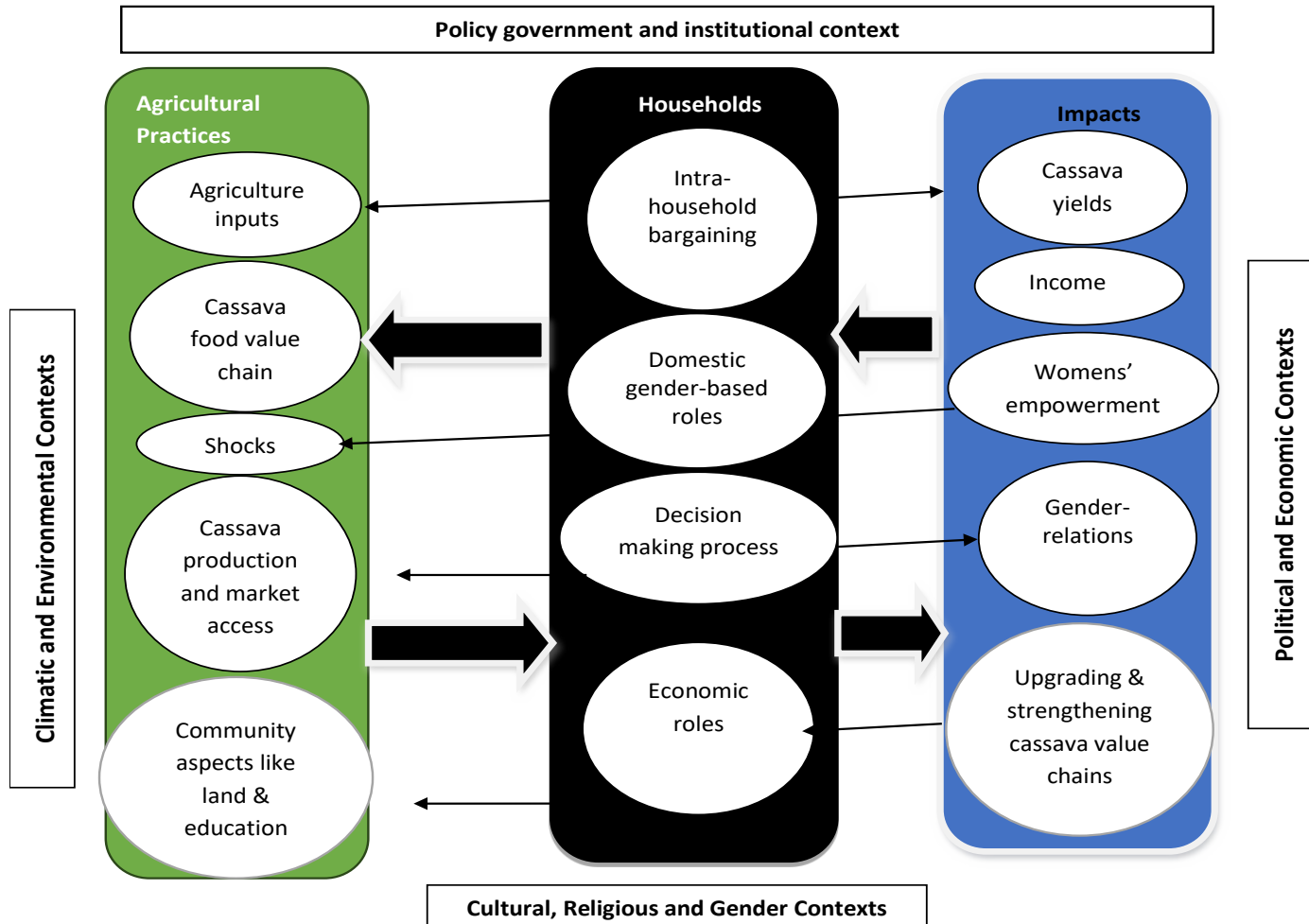


Figure 1: A schematic representation of the household- and gender-based agricultural commodity value chain
 Source: Authors' own conception

Figure 1 depicts the conceptual framework developed for analyzing the gendered dimensions of the cassava food value chain at the micro level. The first element of the framework is the context, which may include a broad range of ecological, social, economic, and political factors. Currie and Vernooy [35] have argued that women continue to face constraints relating to limited access to and control over land, labor, financial support, and other services, such as extension, training, and education. Shocks, such as droughts, floods, and pandemics such as COVID-19, have differential impacts on household members. Extreme climatic events affect female and male household members differently because their coping strategies are influenced by prevailing cultural values, rules, ownership, and control of household assets and regulations [36]. For instance, low levels of rainfall may be less of a constraint for men if their fields are irrigated than for women whose fields are not irrigated (and vice versa) or for women who have the primary responsibility for collecting water for the household, which accounts for a significant proportion of their time [17].

Intra-household power dynamics play a critical role in determining (a) options available to women to participate in the cassava value chain, (b) the responsibilities undertaken by men and women, and (c) the involvement of men and women in decisions on the division of benefits from the labor they may have provided [17]. Hence, the critical issues addressed in this framework are the differential interests of men and women, women's vulnerability to male authority, and intra-household bargaining power. Suppose women have sufficient bargaining power with limited authority. In that case, this indicates their empowerment and higher incomes if there are increased yields and a more robust cassava value chain. Strengthening women's participation in high-value nodes of the cassava chain, such as marketing, improves their cash income share and increases the household budget allocated to household consumption and other necessary social amenities ([37, 38].

The area of land determines the land allocated for cassava production, which is usually marginal land. Household power dynamics and the decision-making process also influence land allocation. This finding is endorsed by Currie and Vernooy [35], who argued that women continue to deal with constraints of limited access to and control over land, labor, financial support, and other services, such as extension, training, and education. In most developing countries, land titles and tenure rights continue to be controlled by men through formal or customary laws.

One of the recent shocks was the COVID-19 pandemic, which disrupted food supply chains and people's mobility. Under such circumstances, men would consider other options, such as off-farm employment, which may not be the case with women with minimal mobility, as shown by Rahman [36] in the context of the northern part of the Hausa Moslem-dominated zone of Nigeria.



Some of the shocks include drastic reductions in market prices that result in low product prices for tubers such as cassava. This will be more detrimental to women, who cannot travel to distant markets, unlike men who travel to more lucrative markets, such as urban and nearby foreign markets. The findings of Meizen-Dick *et al.* [33] in Malawi and Uganda revealed that women were more likely to participate in local markets, selling legumes and livestock products, such as milk. In Bangladesh's dairy value chain, women were found to be restricted from going to the markets [39]. Women's domestic roles are confined to fulfilling the family's immediate needs, such as production (cooking and caring for the sick and elderly) and their reproductive roles. Their economic role is also confined to the family and immediate community engagement projects over very short durations.

Improved agricultural practices and smallholder household activities manifest in increased household yields. When inputs and land, climate, and environment are conducive, cassava yields increase. This was observed in Kigoma, where the fertile red soil, which is predominant, is an essential medium for cultivating several crops, including cassava. These factors also result in increased incomes from sales of cassava products, which in turn positively influence production, as more inputs can be purchased using disposable incomes realized from the cassava sales. Intra-household power dynamics play a critical role in determining the degree to which women have options to become involved in the cassava value chain, the responsibilities men and women undertake, and their involvement in decisions about the division of benefits from the labor they may have provided [17]. Hence, the key issues to be addressed in this framework are the different interests of men and women, women's vulnerability to enforcement by male household members, and intra-household bargaining power. If women enjoy good bargaining power with limited enforcement, this implies that they are empowered and that there are increased yields and incomes and a more robust cassava value chain. The value chain is strengthened, as women occupy most of the critical nodes in the value chain relating to production and processing.

Empowerment of women and men also positively influences decision-making, production, and market access. Specifically, empowerment enables disadvantaged women to own productive resources such as land, participate in the policy and governance arena, and influence the political and socio-cultural landscape to their advantage in the context of the cassava value chain. A study by Hoa *et al.* [40] in Vietnam exploring the influence of gender on the cassava value chain details similar findings that women's empowerment depends on the equitable dynamics within households and social norms within the community. This underscores the relevance of the conceptual framework developed in the paper. Improving women's share of cash incomes through strengthening their participation in high-value nodes such as



marketing within the cassava chain increases their share of the household budget allocated to household consumption and other necessary social amenities ([37, 38]. Religion is another element emerging from the context of culture and gender that greatly influences power dynamics and household members' domestic and economic roles. Power dynamics within households are also shaped by religious beliefs, which affect women's and men's roles differently. This has ultimately far-reaching implications for women's bargaining power, benefit sharing, and the performance of the cassava value chain.

CONCLUSION AND RECOMMENDATIONS FOR DEVELOPMENT

In this article, a conceptual framework for conducting a gendered analysis of the cassava value chains was developed to foster a detailed and nuanced understanding of the social relations, changing gender roles and patterns of resource ownership within households and associated benefit-sharing linked to the broader political, economic, and climatic contexts in which they are embedded. Application of this framework enables the assumption of unitary household preferences to be refuted. It supports the argument that analyses of the contexts in which the households balance their diverse gender-based interests within the cassava value chain can provide insights and inputs for facilitating the emergence of more effective policy instruments and developmental interventions. By emphasizing intra-household gender dynamics, the framework can facilitate the identification of gender inequality relating to resource ownership, participation, benefit sharing, and power relations within the cassava value chain and develop solutions to overcome hurdles in these areas. Future studies can analyze local socio-economic and biophysical trends and identify the differential preferences of men and women participating in the cassava value chain.

The study recommends that development agencies and policymakers adopt and use the proposed framework to address gender disparities within cassava value chains by facilitating the improved ownership of productive resources such as land. Restrictive export taxes and exorbitant quality assurance fees must be adjusted for possible exemption, particularly for women-led entrepreneurship in agrifood value chains such as cassava. The study recommends the use of combined social change innovations to address equitable norms and power relations within households as demonstrated by the conceptual framework in which cultural and religious aspects are interconnected with socioeconomic outcomes. There is an urgent need to improve the women's agency through improved financial inclusion for women since it emerged that they are not active in purchasing inputs and transporting cassava produce and are exclusively excluded in the marketing and income-sharing value chain nodes. Finally, limited access to urban and export markets must be addressed



through an improved all-weather road infrastructure network linking urban markets and rural communities.

ACKNOWLEDGEMENTS

The authors sincerely acknowledge the African Development Bank (AfDB) for funding the study through the International Institute of Tropical Agriculture (IITA) Dar es Salaam Tanzania Hub. Special thanks to Mr. Fredrick Ntwagwabira, the research assistant, and the fieldworkers for their assistance during data collection. Finally, recognition also goes to the reviewers who helped with comments to improve the quality of the paper.

Disclosure statement

Authors have nothing or no conflicts to declare.



Table 1: Gender disaggregated roles within the cassava food value chain among smallholder farmers in Tanzania

Cassava value chain node	Women roles	Mens' roles
Production	Planting	Land clearing
	Weeding	Inputs procurement
Processing	Harvesting	Ploughing
	Peeling	Pressing using machines
	Chopping	Packaging
	Grating	
Marketing	Drying	
	Local wet markets	Large-scale middlemen
	Sale from fields	Cross border trading
		Urban markets
		Long distance transportation

Source: Empirical evidence from interviews and FGDs

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