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REVIEW ARTICLE

Agricultural Value Chains and Gender in the Post-reform Era: A Review

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ABSTRACT

This article systematically reviewed literature on agricultural market reforms, value chains and gender, selected from Global South developing countries to generate evidence on the changes in smallholder agricultural value chains and gender relations, following liberalization reforms. The study specifically aimed to; identify and critically analyse previous attempts to categorize agricultural value chains; and provide new value chain categorizations and associated gender relations. We found that only 5% of the reviewed 60 publications have attempted to categorize agricultural value chains, however with no consideration of gender relations. A new value chain typology has been provided as: "Traditional", Digitally-led", "Group-led" and "Firm-led" value chains, respectively basing on 13%, 35%, 32%, and 24% of the publications. With regard to gender relations, the main finding was that unequal gender relations are inherent in all forms of value chains but tend to be experienced differently by value chain actors –men and women – depending on the type of value chain. The commonly identified underlying factors for gender inequality included; patriarchal structures that bestow upon men decision-making power and control over production resources mostly land. Related were social norms that confine women to the domestic realm, proscribe their mobility and participation in higher value chain nodes and farmer groups. Lastly were gender disparities in education, skills and income leading to differences in access, ownership and use of ICTs. From the results, we note that inasmuch as different forms of value chains present some opportunities for actors, the evolution in smallholder value chains continues to engender equality challenges, mostly affecting women. We contributed to filling the knowledge gap on transformations in post-reform value chains and its effect on gender relations.

Keywords: Agricultural Market Reforms; Smallholder Value chains, Gender Relations

1 Introduction

In recent decades, there has been increasing debate on agricultural value chain transformation in developing countries in the wake of liberalization reforms (Reardon *et al.*, 2009; Reardon & Barrett, 2000; Gómez and Ricketts, 2013; Barret *et al.*, 2022; Sansika *et al.*, 2023). Agricultural market reforms, implemented as part of Structural Adjustment Programs (SAPs), were intended to address malfunctions in the agricultural sector caused by pre-1980 state-directed economic regimes. The regimes were characterised by rampant inefficiencies in marketing systems and disincentives for agricultural producers. These, it was contended, were responsible for production stagnation and balance of payment deficits endemic in developing country economies particularly in sub-Saharan Africa (Barrett & Mutambatsere, 2008; Razavi, 2009; World Bank 1981). Liberalization reforms were therefore initiated to remedy the situation with the hope for; improved efficiency in marketing of agricultural products and increase in rural smallholder farmers' incomes hence better incentives for agricultural production (Bazaara, 2001). The reforms were further seen as an avenue for transforming the dominant smallholder subsistence sector into modern high productivity commercial activity (Yaro *et al.,* 2018; Hinderink & Sterkenburg, 2022).

Evidence from empirical studies (Belshaw & Hubbard, 1999; Balihuta & Sen, 2001; Kasente, Lockwood, Vivian & Whitehead, 2002; Rosairo, 2023; Santha *et al.*, 2024) indicates that liberalization reforms have led to, among other changes; increase in profitability of smallholder non-cash food crops (tradeables), participation of private intermediaries in agricultural markets, and a commercial-oriented production trend among traditionally subsistence smallholder farmers (Adenegan, 2013; Nguyen-Minh, 2023). These changes have led to gradual evolution and transformation of 'traditional' value chains used by majority of smallholder farmers" (Dixon *et al.*, 2007; de Brauw & Bulte, 2021). Further, the increasing gain in value of smallholder non-cash food crops (tradeables) and the collapse of state-run marketing of cash crops which were men's major source of income has, over time, drawn men into production of crops traditionally regarded as 'women's crops, thus altering household production structures.

Altering household production structures implies changing intra-household gender relations in terms of allocation, decision-making and control over production resources (Lay & Golan, 2009; Berhane *et al.*, 2023). Indeed, Masamha (2019, p.57) informs that 'when an agricultural value chain involves profit making, it results into changes in production and distribution relationships between men and women". Thus, as Whitehead (2009) and von Braun & Díaz-Bonilla (2008) indicate, liberalization and structural adjustment reforms are not gender-neutral and continue to produce changes affecting relations between men and women. Agriculture is the linchpin of most sub-Saharan African country economies employing more than 70% of the population (Africa Agricultural Status Report, 2017; Kaneene *et al.*, 2015). In Uganda, it employs over 68% of the working population (UBOS, 2023). These facts notwithstanding, no scholarly attempt has been made to categorise post-reform value chains with consideration of changes in gender relations. This leaves a gap in understanding the effects of transformations in smallholder agricultural value chains on relations between men and women as principal decision-makers in farming households and actors in smallholder value chains.

Gender-inclusive value chains have increasingly been emphasized by governments and development agencies as key in attaining a number of development outcomes including household income, food and nutritional security and general wellbeing of rural-based smallholder farmers (Kini, 2022). Lack of understanding of gender relations amidst persistent changes in smallholder value chains could exacerbate gender inequalities and exclusion of some groups, mostly women, from enjoying benefits of value chain transformation. This could consequently hamper realisation of intended objectives of agricultural market reforms and related targets of the 2030 Agenda for Sustainable Development, mainly goals: 5 -Gender Equality, 1-No Poverty, and 2- Zero Hunger. This article's aim was to;

i) identify and critically analyse previous attempts to categorise agricultural value chains.
ii) provide new categorisations of post-reform value chains and changes in gender relations.

2 Review Criteria

2.1 Literature search

The review followed guidelines on 'supply chain management' provided by Durach *et al.* (2017). Having defined the purpose of the review–stated as 'Objectives' above, literature was obtained from a number of search engines including Scopus (for literature identification based on title/citation, abstract, and key terms), Institute for Scientific Information (ISI), Web of Science (WoS) (title-based search), Google Scholar, and Makerere University online library (MyLOFT). The literature search involved use of terms indicated in Table 1. To obtain quality publications, the search was restricted to peer reviewed journal articles. However, having found other sources: books/book chapters, conference proceedings and policy documents to contain relevant information, these were included. There was no restriction on the publication period, given the article's aim of providing understanding of the transformations in agricultural value chains, from "traditional" to modern day value chains.

Table 1: *Search key words used in literature identification*

Search Item	***Search Key Word***
Agricultural markets Liberalization	"liberalization" OR "structural adjustment reforms" OR "SAPs" OR "neoliberal reforms" OR "globalisation" OR "agricultural markets liberalization" OR "agricultural transformation" OR "agricultural systems change" OR "agricultural commercialisation"
Gender	"gender" OR "gender relations" OR "gender power relations" OR "women" OR "men" OR "female" OR "male" OR "sex" OR "gender transformation" OR "gender change" OR "gender equality" OR "gender equity" OR "gender participation" OR "gender roles" OR "gender division of labour" OR "gender decision-making" OR "gender access to resources".
Agricultural value chains	"agricultural value chain" OR "agri-food value chain" OR "smallholder value chains" OR "smallholder production" OR "agricultural production" OR "rural agriculture" OR "value chain development" OR "value chain change" OR "value chain evolution" OR "value chain transformation" OR "value chain categorisation" OR "forms of value chains" OR "traditional value chains" OR "modern value chains".

2.2 Criteria for Inclusion and Exclusion of literature

Initially, the search from all the five sources yielded over 126 publications. However, these were subjected to further screening and in-depth evaluation using the criteria detailed in Table 2, remaining with only 60 publications on which this article is based. Distribution of the publications is provided in Figure 1.

Table 2: *Criteria for inclusion and exclusion of documents*

Inclusion	***Exclusion***
i. Publication is written in English ii. Publication focused on agricultural market liberalization reforms OR smallholder value chains OR Commercialisation OR gender /gender relations iii. Publication is from credible source	i. Publication is not written in English ii. Publication does not focus on agricultural markets liberalization reforms OR Commercialisation OR smallholder value chains OR gender/gender relations iii. Publication is not from credible source

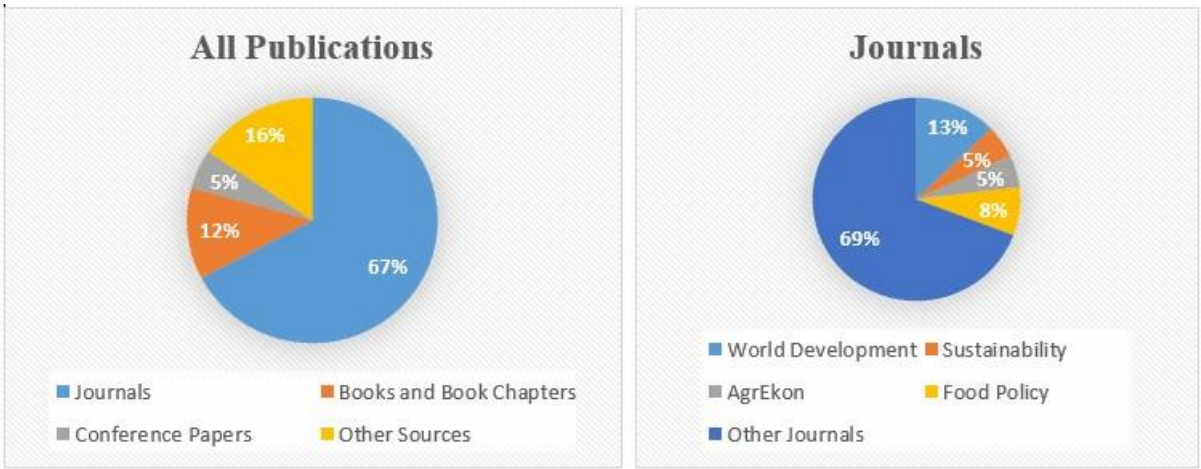

Figure 1: *Distribution of literature by publication*

3 Results and Discussion

Data from the 60 publications that met the criterion stated in Tables 1 and 2 was extracted and entered into excel spread sheet and later imported into STATA Version 17 for analysis and synthesis. The aim was to identify new value chain typologies and emerging gender relations. Table 3 presents summary /descriptive statistics from the analysis. The first row provides results for previous scholarly attempts to categorize value chains, as per objective I of this review.

Table 3: *Summary Statistics/Results*

n=60						
			Gender consideration			
			Yes		***No***	
Value Chain categorisations	***Publication Frequency (f)****	***Percentage (%)***	***Publication Frequency (f)***	***%***	***Publication Frequency (f)***	***%***
Previous categorization	3	5	0	0	3	100
Traditional	8	13.33	3	37.5	5	62.5
Digitally-led	21	35	16	76.19	5	23.81
Group-led	19	32	14	76.68	5	26.32
Firm-led	14	24	5	35.71	9	64.29

*****The total publications indicated in this table is more than 60 since some publications applied to more than one category**.**

3.1 Previous attempts to categories agricultural value chains

Results indicate only 3 publications (5%) to have attempted to categorise agricultural value chains, viz: de Janvry & Sadoulet (2019), Bellemare & Lim (2018), and Gómez and Ricketts (2013). de Janvry & Sadoulet in their work titled: "*Agricultural Value Chain Development and Smallholder Competitiveness"* (p.3), basing on Byerlee & Haggblade's (2013) "*Business models for smallholder agriculture*" categorize value chains as: "Spot markets; Collective action for marketing; Contract farming with individual smallholder farmers or producer organizations; Out-grower schemes with plantations or estates; and Vertically integrated commercial firms". de Janvry & Sadoulet's categorisation touches on almost all forms of value chains, and in fact provides the basis for our categorisation, presented under Section 3 of this article. However, they only provide an outline without detail. Second, their categorisation of "Contract farming with smallholder farmers" and "Out-grower schemes" as stand-alone forms of value chains disregards the fact that these forms base on existence of a "processor" or "nucleus firm" which is the originator of contracts with smallholders and farming agreements with out-growers. Although terms of dealing in farming contract and out-grower agreements may differ, both arrangements target smallholder participation in producing for a processor or nucleus firm (see: Byerlee & Haggblade, 2013, p. 18). They are therefore driven and led by a "*processing firm*".

Bellemare & Lim (2018) in an article titled: "*In All Shapes and Colors: Varieties of Contract Farming"* (p.382) have advanced the concept of *modernised* and *vertically integrated* value chains under contract farming. It is contended that V*ertically integrated* value chains are identified by increased vertical coordination of activities of fewer farmers, wholesalers, and processors. This form of value chain, it is indicated, emerges from two types of contracts, viz: 1) production contracts, and 2) marketing contracts. Under the former, the processing firm controls production-related decision-making but also provides key inputs such as technology and credit in return for an agreed-upon quantity and quality of a product, while smallholder farmers typically provide land, labour, and equipment. In the latter, smallholder producers are largely autonomous while undertaking production and only price and quantity (and quality) are determined by the processing firm. It is our considered view that farmer contracts, whether for production or marketing, are under the control of one party: *the firm or enterprise*–hence "Firm-led" value chains (expounded later under sub-section 3 (d)).

The last attempt to categorize value chains is by Gómez and Ricketts (2013) who, in their article: *Food value chain transformations in developing countries: Selected hypotheses on nutritional implications* (p.141), indicate that food value chains can take different forms depending on the types of participants and their interactions, target markets and the type of products that are offered to consumers, as follows: "traditional", "modern," "modern-to-traditional," and "traditional-to-modern".

It is evident from these categorizations that no attempt has been made to include gender. However, the fact that gender relations tend to change with socio-economic changes, including transformations in

smallholder agricultural production, makes the inclusion of gender in analyses and categorisations of value chains a central issue. It is on basis of this that new typology of value chains with gender consideration is provided, as detailed in 3.2 below.

3.2 Categorization of value chains with gender consideration

Literature (Hodgson & McCurdy, 2001; Alahira, 2014; Barret, 2010) indicates that traditional societies and those which have adopted reforms tend to exhibit different characteristics and patterns of gender relations in agricultural production. Most pre-reform traditional societies, particularly in sub-Saharan Africa, were organised in such a manner that roles of men and women in households and agricultural production were more differentiated. However, liberalization and commercialisation of smallholder agricultural production, including adoption of new technologies, have changed the nature, operational scope and value chain linkages, resulting into *modern* value chains (Reardon & Barret, 2000; Barret *et al.,* 2022). Further, these changes are indicated to have produced social patterns different from those in traditional societies thus transforming social relationships. This implies changes in gender relations. This section provides categorisation of post-reform values chains –interconnections of which are illustrated in Figure 2. Our categorisation begins with "traditional" / "physical" value chains premising on the fact that they are the basis for existence of all other forms of value chains.

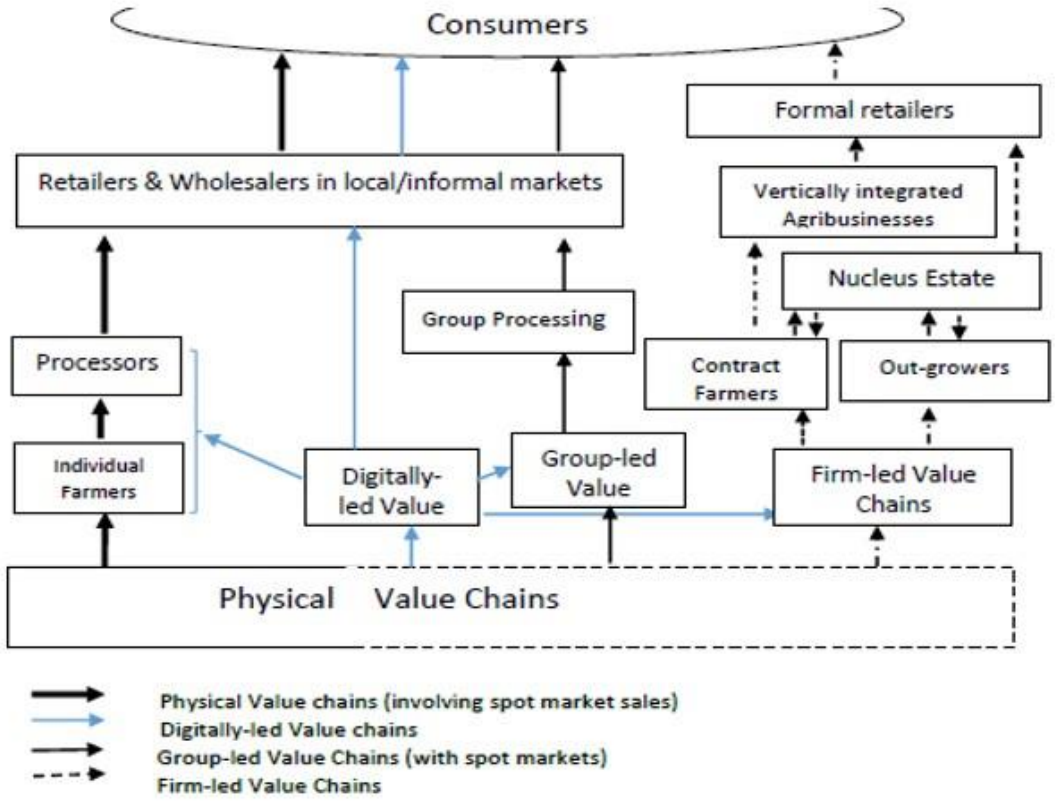

Figure 2: *Categorization of post-reform agricultural value chains*

3.2.1 Physical Value Chains

About 13% of the reviewed studies identified existing value chains as physical or "traditional" value chains. Reardon *et al.* (2009) define "traditional" value chains as 'person-to-person' value chains that existed among "traditional" farming societies. These value chains can be understood basing on Porter's (1985) model which takes value chains to follow a linear flow of activities. Accordingly, Porter (1985, p. 36) indicates that physical value chains comprise of primary and supporting activities in which case primary activities include

production, marketing, and sale of a product while support activities are there to facilitate the primary activities. Literature (Byerlee & Haggblade, 2013; de Janvry & Sadoulet, 2019) indicates physical or traditional value chains to be characterised by "spot markets" involving a number of actors: smallholder farmers, medium scale intermediaries, and retailers. "Spot markets" mainly apply to low-value staple food crops sold in local-based or domestic markets (de Janvry & Sadoulet, 2019). Therefore, traditional value chains are commonly found in small rural-based market settings located within or relatively close to production areas (Gómez & Ricketts, 2013). Studies (Reardon *et al.*, 2009; Gómez & Ricketts, 2013) further posit that food purchases in traditional value chains are made by consumers, following long-lived patterns, either from traditional smallholder farmers themselves, from retailers owning stores, vending on streets or road sides, or from traders in regional and local "wet" markets. "Wet" markets are smaller local-based markets operating on weekly basis or large markets functioning as regional distribution hubs (Gómez & Ricketts, 2013, p. 141). Women participate in these markets by selling agricultural items in small quantities as road-side traders or sellers in markets near their homestead. Hence, these markets, small as they may be, enhance women's involvement in the value chain mostly in the marketing node and accessing financial benefits from value chain participation.

Literature (Reardon *et al.,* 2009) indicates that in physical value chains, production and other value chain activities are mainly dependent on physical factors including physical inputs and labour, and there is physical flow of resources, including physical delivery of products to consumers. We argue that this mode of production and value chain operation implies that the nature of the activities largely determines gender division of labour in agricultural value chains. Our reasoning is supported by 37.5% of the reviewed literature (Table 3), including earliest studies on gender division of labour in traditional agricultural production in Africa (i.e. Baumann, 1928 and Boserup, 1970). For instance, Baumann's study which analysed gender division of labour in the African "hoe culture" indicates that in the tropical forest areas, land clearing is undertaken by men while other activities: ground setting (ploughing), sowing (planting) and harvesting are done by women. Boserup, on the other hand, characterises traditional agricultural production in most communities in tropical Africa as that of "shifting cultivation". In this system of cropping, farmers shift from pieces of land whose natural fertility has diminished to fresh ones, a process which involves felling of trees and/or land clearing. These, Boserup notes, are considered the "hardest tasks" and are undertaken by men while women concentrate on other value chain activities considered as "light tasks" including burning of the felled tree leaves, sowing or planting in the ashes, weeding, harvesting and carrying the crop home for storage or consumption. However, we further argue that this form of division of labour cannot be taken as a rule given that there are instances where men have participated in other activities beyond the felling of trees ploughing or land preparation, harvesting and carrying the harvest home, mostly where it is in plenty. This argument is affirmed by Feldstein, Butler & Poats (1989, p.8) who assert that "gender responsibility in traditional agricultural production in developing countries falls into culturally defined patterns including 'separate task' and 'shared task' patterns". In the former, some or all of the tasks within a single crop cycle are assigned by gender, while in the latter, men and women share tasks on the same crop.

Both earlier studies (Baumann, 1928; Boserup, 1970; Feldstein, Butler & Poats, 1989) and most recent ones focusing on specific sub-Saharan African countries (Biketti *et al.,* 2016; Alahira, 2014; Berhane *et al.*, 2023; Tekwa, 2023; Mukaila, 2024; Kugbega & Andersson, 2023) attribute gender division of labour in agricultural production to the oldest form of patriarchy in which factors such as ownership of arable land and cultural norms dictate men's and women's roles in the household. The patriarchal system puts the man, who is culturally considered the head of the household, in a privileged position in terms of decision-making and control over production resources (land, labour and income) and other value chain activities, mostly marketing which is considered to be financially rewarding. Traditional cultural norms confine women to the household realm and to lower value chain nodes and activities such as production and post-harvest operations limiting their participation in higher nodes, particularly marketing.

3.2.2 Digitally-led Value Chains

21 of the 60 reviewed publications (35%) indicated agricultural production in developing countries to be relying on digital technologies, mainly mobile telephones, radios and televisions. Studies (FAO, 2021; Zougmoré & Partey, 2022; Abate *et al.*, 2023) indicate these devices to be part of the 'less advanced' ICTs that have been adopted in Global South countries following the 'digital revolution'. Driven by global market forces, the 'revolution' has led to introduction of various digital technologies targeting transforming the agricultural sector (Mikhailov, 2022; Martens & Zscheischler, 2022). Therefore, Digitally-led value chains are a result of digital transformation in agriculture. Rijswijk *et al.* (2021, p.79) define digital transformation as "a fundamental and ongoing socio-technological change process in which digitisation and digitalisation increase over time" while Digitalization is defined as "the socio-technical processes surrounding the use of a large variety of digital technologies in agriculture". Unlike the ICTs mentioned, digital transformation has also embraced use of more advanced digital technologies among which include Block Chain, Big data and Precision Agriculture (PA) technology such as drones, and Artificial Intelligence (AI). These are, however, largely applied in value chains in developed European and North American countries and in Asian and Pacific regions, specifically in the rice belts of China, India, Japan, Thailand and Vietnam (Mikhailov, 2022; Xie, Luo & Zhong, 2021; FAO, 2021).

Furuholt & Matotay (2017) posit that digital transformation occurs at all nodes of the agri-food value chain and may apply to all extended processes including acquisition of inputs and labour, accessing finances, and other production-related processes. It may as well include other actors along the value chain, viz: smallholder farmers, retailers and agro-processing enterprises. Evidence from literature (FAO, 2021; Kitole *et al.*, 2024) indicates ICTs to have enabled smallholder farmers to access information and services including; i) market linkage, that is, connecting farmers to other value chain actors such as input suppliers, labourer providers and buyers ii) digital farming information and advisory services, iii) financial services. For instance, Tricarico & Loukos (2017) and Mapiye *et al.* (2023) reveal that mobile phone-enabled tools have been used by smallholder farmers to access information on best farming techniques, generate farmer's digital profile and farm management systems. Through smartphone apps and SMS services, farmers can access market information, make and receive payments, secure credit, connect and conduct commercial transactions with other value chains actors such as buyers and input suppliers. Mobile phone-enabled financial services including mobile money, M-Pesa have enabled smallholder farmers to access banking and other related services. Televisions and radios have also acted as a medium for dialogue and have enhanced smallholder farmers' access to information on modern production practices, weather, and market prices, among others (Onyeneke *et al.*, 2023; Trendov *et al.*, 2019).

Regarding gender, 16 of the 21 publications (76.19%) indicated the introduction of ICTs in agricultural production in the global south, particularly in sub-Saharan Africa to have impacted on gender relations, either positively or negatively. Studies (Zougmore & Partey, 2022; Mpiima, 2014; Gakuru, Winters & Stepman, 2009) posit that introduction of ICTs aimed at transforming farmers in rural-based households from subsistence to commercial farming and therefore tends to produce enormous effects on relations between men and women in such households and value chains. As Mpiima *et al.* (2019) reveal, such effects begin with the decision for the adoption and use of ICTs for agricultural information. Rudeman & Glick (2008) indicate that the decision to adopt and use ICTs in a household is arrived at through negotiation. Negotiation processes tend to favour men given that patriarchal systems bestow upon them power and authority over household resources including arable land, income and therefore all production processes and value chain benefits.

Gender relations are also traceable in technologies themselves, hence "technology gender relations" including technology access and use, control, and "technology functionality" (Mpiima, 2018). Mpiima notes that radios and televisions, termed as 'traditional ICTs' are technology transfers to the entire household while mobile phones are technology transfers to individuals. This implies different gender relations in terms of access, use and control over these ICTs. Access to ICTs, mostly mobile phones, is mediated by

affordability by the individual farmer which largely hinges on financial power (Smidt & Jokonya, 2021). Evidence from studies (Zougmoré & Partey, 2022; Chassin, 2022) revealed that rural women's financial power is always low given their limited access to and control over household resources and income, hence "social affordability" involving relying on social networks –spouses, household members including children, relative and friends – to access mobile phones. This further implies women's high ICT dependency. Mpiima's (2018) study on "technology access and use in agricultural production in Uganda" concludes that while both men and women may exercise control over the use of traditional technologies (radios and televisions) in the household, this does not apply to mobile phones whose use is more regarded as private. Husbands tend to exercise their masculine power to control their wives' phones and use them to monitor their mobility thus domesticating their participation in extra-household and higher node value chain activities, mainly marketing. Lastly, while we may argue that the discussed ICT-related constraints are not exclusively for women but affect some men as well, Chassin (2022, p.9) insists that "women are more affected, given the patriarchal structures in most African social settings that limit women's control over the land resource and the historical disparities in income that undermine their financial independence".

A number of studies (Doss, 2001; Kirui & Njiraini, 2013; Smidt & Jokonya, 2022; Evans, 2018) have underscored the importance of digital technology in promoting equal gender relations in smallholder agricultural production. Doss (2001) argues that digital agricultural technologies, mostly mobile phones, have the potential to reduce "food crop"– "cash crop" dichotomies by enabling women to produce "men's crops" and moving to higher value chains nodes. Similarly, Kirui & Njiraini (2013) found that ICTs, mostly mobile phones, significantly enhance women's capacity to participate in commercialised value chains. Kevane (2012) posits that mobile phones are key in enabling women to overcome mobility restrictions by easing access to information on markets and expanding social networks hence strengthening their decision-making and bargaining position in the household.

These positive contributions notwithstanding, it remains evident that women continue to face a number of interplaying barriers preventing them from equally benefiting from digitalised smallholder agricultural value chains (Chassin, 2022; Munyua, 2000; Partey *et al.*, 2020; Zougmoré & Partey, 2022). Among these include i) limited access to and control over production resources mostly arable land and financial resources making it difficult for women to acquire ICTs ii) restrictive cultural norms that restrain women's ownership of ICTs mostly mobile phones and proscribe their participation in distant markets (Chassin, 2022). Empirical studies (Partey *et al.*, 2020; Zougmoré & Partey, 2022) indicate that in most African rural households, men control financial resources and are often the ones responsible for purchasing farm equipment including mobile phones. In fact, Munyua (2000, p.94) characterises rural women's situation as that of "poverty, illiteracy and lack of basic skills, and inability to afford the most basic forms of ICTs such as telephones and radios". This generally implies "technology functionality" constraint. It is our considered view that illiteracy, lack of digital skills and inability to operate mobile phones by women compromises their privacy and puts them at the risk of losing their savings kept on phones through seeking 'third party' assistance in making deposits, withdrawals, or even confirming transaction balances. Women may further lose control over their income or saving mostly if such assistance is sought from a spouses who has harboured interest to gain access to his wife's income. Such a situation jeopardises women's struggle for equality and keeps them less empowered since they can hardly freely acquire ICTs neither apply them in value chain activities and in accessing information. Hence to them, the adage "information is power" remains of no significance.

3.2.3 Group-led Value Chains

About 32% (19 out of 60) of the publications identified for this study indicated post-reform production-related activities to be undertaken by farmers in groups (Table 3). The continued demand for value added products, the desire to transform agricultural production and to improve its benefits has led governments and other development actors to re-organise smallholder farmers into groups (Reardon *et al.,* 2009; Ampaire *et al.,*2020). Group-led value chains are therefore a result of new farmer groups formation. Grossman and

Hanlon (2012) define a 'farmer group' as a small self-governed organisation that exists to provide members who voluntarily join the group for public good. To Adong (2014), farmers' groups/organisations mean all organisations and groups –formal and informal– for production and marketing of farmer cooperatives and farmers' savings and credit cooperative societies (SACCOS) and may also include area cooperative enterprises (ACE). Organisations are considered to be farmers' groups for as long as farmers "cooperate" with any activity along the value chain.

Reviewed literature indicates that until 1980s, prior to liberalization, production and marketing activities in developing countries including supervision, extension, transportation and processing were state's monopoly, controlled under producer and marketing boards and cooperatives (Hill *et al.*, 2021; Asiimwe, 2018). However, with adoption of structural adjustment programme (SAPs) by which agricultural markets were liberalized, "intermediary" cooperatives collapsed (Asiimwe, 2018). Pre-reform farmer groups underwent transformation in management and have since assumed multiple functions. Mugisha *et al.* (2012) inform that farmers today are organized into much smaller self-initiated groups and rural producer organisations (RPOs). These are used by development actors and governments as avenues for reaching rural smallholder farmers for services including extension services, technology transfer, credit, and agricultural inputs, all key in enhancing production and value chain performance under the commercialization drive (Mugisha *et al.* 2012; Mpiima *et al.,* 2019). New farmer groups are also instrumental in collective marketing by facilitating market linkages and enhancing smallholder farmers' capacities to negotiate better prices (Bernard & Spielman, 2009).

As indicated in Table 3, over 76% of the identified publications have explored smallholder farmers' participation in value chains and collective action in Africa, putting gender at the centre of their analyses (Fischer & Quaim, 2012; Gotschi, Njuki, Delve, 2008; Bernard & Spielman, 2009; Markelova, 2010; Mpiima *et al.,* 2019; Missiame *et al.,* 2023). Fischer & Quaim (2012) have concluded that group membership enhances women's share of household income while Bernard & Spielman (2009) have argued that women's participation enhances their physical mobility and freedom outside the household. Mpiima *et al.* (2019) posit that farmer groups are key in promoting equality since they operate on rules that "equally" apply to both men and women as members which is key in cushioning women from household patriarchal excesses and reduces control of husbands over their wives' proceeds and the possibility of non-consensual use of women's income by their husbands. These are all ingredients in promoting equality by including historically marginalized women and increasing their independence in terms of activities like selling produce, earning income and deriving other benefits including making use of reciprocal labour provided by group members. Overall, farmer groups provide options for women outside the domestic realm where they have traditionally been confined in terms of accessing credit, income and social capital. Groups in a way, provide a 'fallback position' increasing women's bargaining power both within and in the extra-household arena (Agarwal, 1997, p.12).

However, like the case is with value chain categories earlier discussed, a number of gender relations issues have been associated with group-led value chains, mostly tending towards constraining women's membership and participation in collective action (Baluku, Mayoux & Reemer, 2009; Miroro *et al.*, 2023). Fischer & Quaim (2012) argue that increasing commercialization of agriculture has led women to lose control over commercialized crops which they attribute to unequal intra-household gender power relations and disparities in access to productive resources mostly land. Meier Zu Selhause (2016) and Miroro *et al.* (2023) observed that the land resource in most African societies traditionally belongs to men. Therefore, women may often not be eligible to join cooperatives in cases where land ownership is a condition doing so. Other constraints include discriminatory cultural norms and tendencies both within the household and the extra-household arena. Discriminatory tendencies and prejudices in the extra-household context increase women's vulnerability to exploitative trading practices and further weaken their bargaining power in male-dominated market networks (Baluku, Mayoux & Reemer, 2009).

3.2.4 Firm-led Value Chains

Regarding this form of value chain, 24% of the reviewed literature related exiting agricultural production to arrangements involving processing firms and other players, thus Firm-led Value chains. We define Firm-led value chains as arrangements in which a "firm" or processing enterprise or company is at the centre of backward and forward-looking linkages with smallholder farmers and other market intermediaries. Reardon *et al.* (2009, p. 1720) allude to the fact that "firm-led value chains are a result of the evolution in relations between 'spot markets' or 'traditional markets' and 'vertical institutions' which includes contracts and various forms of market inter-linkages". We put these arrangements and interlinkages into three categories: Contract farming; Out-grower schemes; and Vertically integrated enterprises. Each of these is expounded below.

Contract farming

Eaton and Shepherd (2001, p.2) define contract farming as "an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices." Contracting between a downstream large processing firm or buyer and smallholder farmers may be based on one or a combination of elements which according to Byerlee & Haggblade (2013, p.13) include: quantity, quality and delivery time; resources including inputs and technical advice which are normally repaid by the producer at harvest time; and production-related processes key in complying with food safety and certification standards. Therefore, under contract farming arrangements, agribusinesses obtain supply of raw materials for their processing needs, usually at an agreed price, while smallholder farmers obtain critical inputs such as improved seeds, extension services, credit and ready market for their produce (Masakure & Henson, 2005; Byerlee & Haggblade, 2013). Elepu & Nalukenge (2009) have posited that contract farming arrangements provide an avenue for smallholder farmers to commercialise their farming operations through creating "forward market linkages".

Contract farming is common with perishable products and those that are rarely found in spot markets; it is common with crops grown on large scale basis where buying companies can exercise power in enforcing contracts with smallholder producers (Byerlee & Haggblade, 2013). Contract farming arrangements have traditionally applied to plantation crops such as sugarcane and tea. However, as Elepu & Nalukenge (2009) contend, other agribusiness firms such as those dealing in dairy, oil seeds, natural bee products, cotton, coffee, sesame and some co-operatives have also entered contracts with smallholder farmers. Contract arrangements are beneficial to smallholder farmers as far as they help access credit, inputs, insurance, new technology and extension services (de Janvry & Sadoulet, 2019; Barret *et al.,* 2010; Bellemare,2012). However, as Bellemare & Lim (2018) indicate, contract farming arrangements may be detrimental in that they lead to creation of agents with monopoly powers hence setting prices that disfavour smallholder farmers.

Out-grower schemes

Out-grower schemes associate smallholders with a large "nucleus firm" wherein production of an agricultural commodity is delegated from a processing firm (nucleus firm) to smallholder out-growers who deliver the product on agreed terms (Bellemare & Lim, 2018). Out-grower schemes are different from contract farming in that under out-grower schemes, focus is on processing firm providing initial investment capital for smallholder participation (Byerlee & Haggblade, 2013). However, it is important to note that the distinction between "contract farming" and "Out-grower schemes" is too thin since both involve production "agreements" between a large producer (processing farm) and smallholders. In fact, in some instances, the two terms have been used interchangeably (de Janvry & Sadoulet, 2019, p.3; Key & Runsten, 1999, p.382; Bellemare & Bloem, 2018, p.5). Out-grower schemes are characterized by investors co-financing establishment of the crop up-front and also agreeing to processing of the final product although the arrangements may exclude contracts for supply of input and receiving technical assistance (Bellemare & Lim, 2018).

Out-grower schemes are common with perennial crops such as sugarcane and oil palm given the high initial investment required to establish a crop that may not provide harvest and returns for several years. Out-grower arrangements arise out of two reasons: i) the processor's shortage of labour and management resources to work on the large plantations ii) Smallholders' lack of capital to invest over several years prior to the first harvest. Therefore, investors (processing firms) have to enter an agreement with smallholders for the former to develop the plantation for later transfer of its management and ownership to the latter (Byerlee & Haggblade, 2013).

Vertically integrated commercial firms

"Vertical integration" is an arrangement in which a firm controls different stages along the value chain. Contract farming, an arrangement where the production of an agricultural commodity is assigned to a grower by a processing firm, is the foundation of vertically integrated and modern agricultural value chains (Bellemare & Lim, 2018). Therefore, referring back to our earlier position under *Section 2* where Bellemare & Lim's (2018) concept of "*modernised*" and "*vertically integrated"* value chains under "farming contracts" was explained, we stressed that the "processing firm" remains at the centre of production and marketing contracts and all relationships and inter-linkages created, whether backward- or forward-looking. Our position in regard to this is that value chains that involve processing firms (at the centre), out-growers (backward linkage) and distributory entities (forward linkages) constitute a "holistic" interconnected value chain system –'the firm-led value chain system'. Vertical integration involves medium and large enterprises producing for the local market or for export e.g. horticultural export enterprises and those dealing in sugar and oil seed products (Byerlee & Haggblade, 2013). Vertical marketing linkages have also arisen from what Reardon *et al.* (2013) have termed as the "supermarket revolution" resulting from globalisation. The 'revolution' has culminated into increasing vertical integration aimed at ensuring farmers' compliance with food quality and safety standards (Reardon *et al.,* 2009; Reardon *et al.,* 2010; Barret *et al.,* 2022). The net effect, mostly on the upstream segment of the value chain is the earlier mentioned commercial-oriented production and change in farming methods involving shifting from traditional subsistence to more intensified farming involving adopting new technologies.

Concerning gender, results showed very few studies (35.76%) related to this form of value chain to have addressed gender relations. Firm-led value chains, as earlier indicated, comprise of an interconnected string of actors at various levels, smallholder farmers being the primary players. Hence, the changes in gender in these value chains are more felt and are therefore traceable at household level. A study by Bellemare (2012) concluded that contract farming improves the welfare (income) of members of smallholder farming households, which implies improved gender-power relations for some members, mostly women. However, evidence from literature (Elepu and Nalukenge, 2009; von Bulow and Sorensen, 1993; Dolan, 2001; Schneider & Gugerty, 2010) indicates that women are largely underrepresented in contract farming and are usually crowded in lower and more laborious value chain activities, mostly seed production. Limited access to and control over the land resource and household income have been pointed at as key factors responsible for women's unequal participation in contracts (Hoang & Nguyen, 2023; Schneider & Gugerty, 2010). The land resource is central in contract formation which normally bases on title holding which dictates who opens a bank account and therefore receives payment. Majority of women are technically excluded from receiving payments since few of them hold land titles in their own right (Eaton and Shepherd, 2001). The 'male-headship' predisposition causes women to be excluded from receiving other services such as credit and extension oriented towards the male-head of the household. Women may only freely access these services where they have become *de jure* household heads. In instances where women hold *de facto* headship, they may not freely enter into contracts or even participate in activities such as attending training sessions as patriarchal family arrangements dictate upon them to wait for their husbands' decision (Dolan, 2001; Schneider & Gugerty, 2010). Table 4 below provides value chain typologies and associated gender relations issues.

Table 4: *Value Chain typologies and associated gender relations issues*

Value chain type	***Participants***	***Mode of operation***	***Gender relations issues***
Physical/ Traditional Value chains	Individual smallholder farmers; processors, traders/retailors in local (spot or "wet") markets, local-based consumers.	Physical interaction, physical production, inputs delivery, labour and resource flow and product delivery to consumers.	• Culturally defined roles limiting women's participation to lower value chain nodes (i.e. production, processing, harvesting) • Patriarchal-based land holding systems limiting women's access to, ownership, decision-making and control over land resource and other production resources. • Social norms confining women to the domestic/household realm and proscribing women's movement and participation in extra-household activities.
Digitally-led Value chains	Individual smallholder farmers; local-based consumers, processors, dealers, retailors, long distance and cross boarder traders.	Heavy reliance on digital technologies: mobile phones, radios, televisions, in: input and labour acquisition, marketing of output; accessing information and services such as modern farming practices, market/ market information, financial services.	• Patriarchy limiting women's participation in "bargaining" processes to adopt/acquire ICTs. • Women's limited affordability of ICTs due to constrained control over household income, hence "*social affordability"* and "*technology dependency"* • Illiteracy and lack of skills, hence "*technology functionality"* challenges among women. • **However:** ICTs enable women to overcome mobility challenges, access information, build networks, strengthening their bargaining position & decision-making capacity.
Group-led Value chains	Group-based small holder farmers, group processing and marketing; dealers, retailers, long distance and cross-border traders	Group-based production, processing, collective marketing and access to information and financial services (credit)/ through group cooperation.	• Inequality in ownership/control over land resource, constraining women's membership to cooperatives/groups; also limits access to credit due to lack of collateral security • **However:** Groups cushion women against patriarchal excesses; increase autonomy and offer options outside the household in marketing, accessing credit, labour, and earning income – provide women a 'fallback position'.
Firm-led Value chains	Smallholder farmers, out-growers, processing firms, retailers in formal markets, integrated agri-businesses.	Production through contract arrangements between processing firms, smallholder farmers, out-growers and marketing through vertically integrated agri-businesses.	• Inequality in ownership (title holding) and control over land resource, limiting women's participation in contract formation; also bars women's registration with financial institutions where land title is prerequisite limiting access to income. • Patriarchal structures and norms –exclude women from extension and training services and making contract-related decisions.

4 Conclusion

This article reviewed literature on liberalization, agricultural value chains and gender with an objective of providing new categorisations of value chains and changes in gender relations that liberalization reforms have given rise to. We underline the fact that the reforms have led to evolution and transformation of agricultural value chains, giving birth to what we have termed as *modern* value chains. A new typology of value chains has been provided as: 'Traditional', 'Digitally-led', 'Group-led', and 'Firm-led' value chains. While agricultural value chains take various forms, as indicated, we note that these forms are not mutually exclusive – different forms co-exist. For instance, given that agriculture in most developing countries has

not fully transformed in terms of adopting new technology and modern production, traditional or physical value chains remain embedded in almost all other forms. Each of the forms of *modern* value chains: Digitally-led, Group-led, and Firm-led in one in way or another shares features of physical value chains. This as well applies to Digitally-led value chains, as illustrated in Figure 2. Agricultural value chains, therefore, do not exist in pure form. In fact, in our view, physical value chains provide a "bedrock" for existence of all other forms. Quite different from previous categorisations, in the new categorization, "contract farming", "out-grower schemes", and "vertically integrated firms" have been put together as "Firm-led value chains". Our reasoning is that the "processing firm" remains at the centre of production and marketing contractual arrangements and all the resulting relationships and inter-linkages, whether backward- or forward-looking. Therefore, arrangements involving processing firms, smallholder farmers and out-growers and the vertical market distribution interlinkages constitute a "holistic" interconnected value chain system –the "Firm-led value chain system". On the gender perspective, the study revealed that gender inequalities are inherent in all the four forms of value chains although they are differently experienced by men and women. Similarities were found across value chain categories in terms of factors contributing to unequal gender relations, viz: patriarchal structures that put men in positions of authority in terms of decision-making and control over production resources; social norms that proscribe women's mobility, participation in higher value chain nodes, mostly marketing and holding group membership. Lastly were differences in education, skill levels, and income creating disparities in access to, ownership and use of ICTS. We observe that while transformation in value chains may create opportunities for value chain actors, mostly women, the evolution in smallholder value chains continues to produce equality challenges as before provided. The study recommends further independent gender-focused analyses of each form of value chain provided by this study for deeper appreciation of the changes in these value chains and gender relations. Further, as smallholder value chains continue to be targeted as strategic avenues for commercialising rural-based smallholder agriculture, we recommend that incentives provided should be gender-sensitive to minimize the widening gender equality gap. This, in our view, is fundamental in scaling up smallholder agricultural value chains and realizing intended objectives of reforming agricultural markets.

5 Declarations

5.1 Study Limitations

It should be noted that the study's over arching aim was to analyse changes in agricultural value chains and gender relations in view of liberalisation reforms in Global South developing countries. However, the study could not exhaustively analyse changes in gender relations in each of the identified value chain typologies. More gender-focused analyses of each provided value chain categories are required for deeper understanding of gender relations issues and changes that may emerge in the near future.

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