

# Understanding gender dimensions of climate-smart agriculture adoption in disaster-prone smallholder farming communities in Malawi and Zambia

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## Abstract

**Purpose** – Through the application of traditional and contemporary feminist theories in gender mainstreaming, the purpose of this paper is to contribute to emergent debate on gender dimensions in climate-smart agriculture (CSA) adoption by smallholder farmers in disaster-prone regions. This is important to ensure that CSA strategies are tailored to farmer-specific gender equality goals.

**Design/methodology/approach** – An exploratory-sequential mixed methods research design which is qualitatively biased was applied. Key informant interviews and farmer focus group discussions in two study sites formed initial qualitative phase whose findings were explored in a quantitative cross-sectional household survey.

**Findings** – Findings shared in this paper indicate the predominant application of traditional gender mainstreaming approaches in CSA focusing on parochial gender dichotomy. Qualitative findings highlight perceptions that western gender approaches are not fully applicable to local contexts and realities, with gender mainstreaming in CSA seemingly to fulfil donor requirements, and ignorant of the heterogeneous nature of social groups. Quantitative findings establish that married men are majority adopters and non-adopters of CSA, while dis-adopters are predominantly *de jure* female household heads. The latter are more likely to adopt CSA than married women whose main role in CSA is implementers of spouse's decisions. Access to education, intra-household power relations, productive asset and land ownership are socio-cultural dynamics shaping farmer profiles.

**Originality/value** – By incorporating African feminisms and intersectionality in CSA, value of this study lies in recommending gender policy reforms incorporating local gender contexts within the African socio-cultural milieu. This paper accentuates potential benefits of innovative blend of both contemporary and classic gender mainstreaming approaches in CSA research, practice and technology development in disaster-prone regions.

**Keywords** Agriculture, Climate change adaptation, DRR, Climate-smart agriculture adoption, Gender and DRRM, Gender policy

**Paper type** Research paper

## 1. Introduction

As disasters linked to climatic change are projected to increase in frequency and magnitude, efforts should be directed to building resilience and adaptation for smallholder farmers (Joshua *et al.*, 2016). In 2010, climate-smart agriculture (CSA) was introduced, whose pillars are: increased productivity and incomes, building resilience and adaptation to climate-related extreme-weather events, and mitigation achieved through reduced greenhouse gas emissions (FAO, 2013). Therefore, based on these pillars, CSA is considered a disaster risk reduction (DRR) strategy (Lei, 2014; Mathews *et al.*, 2018).



DRR involves policies, strategies and practices systematically developed and applied for the minimisation of vulnerabilities, hazards and anticipated disasters in communities, ultimately contributing to sustainable development (UNISDR, 2004). However, CSA adoption by women smallholder farmers in Africa remains low, yet they are in majority and more vulnerable to climate change impacts (Asfaw *et al.*, 2015).

CSA adoption studies in general and gender-focused specifically have been conducted (Van Hulst and Posthumus, 2016; Farnworth *et al.*, 2016; Manda *et al.*, 2016). Dominance of quantitative econometric analyses to generate understanding on factors influencing adoption cannot go unchallenged (Mango *et al.*, 2017; Murage *et al.*, 2015). Descriptive statistics remain void of rich detail of real-life experiences of qualitative findings (Andersson and D'Souza, 2014; Glover *et al.*, 2016). Recently, a similar study was conducted in East Africa (Nyasimi *et al.*, 2017), but for Southern Africa, no such study has ever been conducted. Although giving gender some consideration, study by Nyasimi *et al.* (2017) suffers dearth of gender-focused adoption studies focusing solely on male/female gender binaries. The traditional gender dichotomy that often characterises gender mainstreaming in the development sector in Africa has been criticised for its parochial nature that sees men and women as homogeneous groups. Furthermore, emphasis on traditional gender binaries may be biased towards addressing mainly practical gender needs that may fail to challenge disenfranchising structural bottle-necks that disadvantage different types of women.

Thus, this study was conducted to examine heterogeneous gender-differentiated profiles of smallholder farmers who adopt, dis-adopt or do not adopt CSA in Malawi and Zambia. For purposes of this study, adopters were taken as farmers who indicated the current use of identified CSA technologies. Dis-adopters were farmers who had discontinued use and non-adopters were those who had never used any CSA technologies. The study also aims to explore the socio-cultural milieu shaping decision making for men and women in CSA adoption. Nyasimi *et al.* (2017) stated that local socio-cultural practices influence CSA adoption. To this end, this study applied contemporary feminist theories, such as African Feminisms (AFs), and traditional feminist theories to explore gender perspectives in CSA adoption. Through the application of contemporary feminist theories to understand gender dynamics in CSA adoption by SHFs, this study accentuates that the promotion of CSA in disaster-prone regions may necessitate gender policy reforms. Gender policy reforms relevant for CSA adoption need to be driven by local contexts to address relevant structural gender needs to empower especially the disenfranchised women whose agrarian livelihoods are threatened by inclement climatic change.

## 2. Theoretical underpinnings of gender mainstreaming in CSA

Understanding contemporary gender discourse in CSA adoption by SHFs in disaster-prone regions remains important for policy makers and programme designers in Africa. Emergent gender discourse suggests need for the local contextualisation of gender, recognising heterogeneity of both men and women (Jost *et al.*, 2016), and going beyond just adding women to make up targeted figures (Asfaw *et al.*, 2015). Critical to gender in CSA adoption is understanding interactions of socio-cultural factors with adoption (Nyasimi *et al.*, 2017), and men and women's common but differentiated realities (Perch and Byrd, 2015) influencing CSA adoption decisions.

Furthermore, contemporary gender dialogue requires that gender mainstreaming considers contextualised African realities where women face many other oppressions in addition to patriarchy (Arndt, 2002; Mekgwe, 2006). Thus, based on the African context, AFs which resist western hegemony underlying traditional feminist theories in gender mainstreaming in African development have emerged. There are various types of AFs, namely African womanism, motherism, STIWA-nism (acronym for social transformation including women in Africa), Nego-feminism and Snail-Sense feminisms.

While detailed narrative of AFs types is beyond the scope of this paper, knowledge of their key tenets is essential for gendered approaches to CSA adoption. Merits of AFs lie in enhancing the appreciation of gender issues within the African context (Coulibaly, 2015; Nnaemeka, 2004; Arndt, 2002). They are inclusive and diverse, accentuating possible heterogeneity of women (Akin-Aina, 2011; Arnfred, 2004). In all AFs, patriarchy and women's subordination is acknowledged and challenged differently. Notably, all AFs view men and women in African communities as complimentary partners who can form alliances to address their developmental challenges. Thus, in relevance to understanding gender tensions in CSA, AFs offer alternative cross-examination of the gender mainstreaming schema.

Apart from AFs, this study also considered intersectionality, which also emerged to address dissensions over perceived western-hegemonic feminist theories. Intersectionality acknowledges the existence of interactions between different categories such as gender, race, wealth and education. These interactions determine individual experiences, socio-cultural ideologies and power dynamics (Davis, 2008). More so, intersectionality acknowledges that social groups are heterogeneous and unequal power dynamics result from existing social structures rendering one group privileged or disempowered. Intersectionality states that while individuals may identify with more than one social groups, unique and mutually exclusive effects often result (Stewart and McDermott, 2004).

In addition, two prominent classic approaches: women in development (WID) and gender and development (GAD) (Lorber, 2010; Okali, 2012; Parpart *et al.*, 2000), still applied in some projects in developing countries (Wilson, 2015), were considered in this study. WID and GAD are criticised for failing to address gender issues, women's disempowerment and marginalisation in developing regions (Davis, 2008; Singh, 2007). These two approaches anchored by traditional feminist theories inform current gender mainstreaming in CSA (Arora-Jonsson, 2011; Collins, 2017).

Relevance of gender in CSA for smallholder farmers is gaining traction as new contributions emerge in the discourse (Beuchelt and Badstue, 2013; Nelson and Huyer, 2016; Twyman *et al.*, 2015). Evidence base for this is the inclusion of a stand-alone Module 18: Gender and CSA in the *Gender in Agriculture Sourcebook* (Collins, 2017). Additionally, the Consultative Group on International Agricultural Research Program on Climate Change, Agriculture and Food Security implemented in parts of Africa also had gender as one of its focus areas. In Southern Africa, Perch and Byrd (2015) have also explored gender in CSA at the policy level. Although literature study indicates progress towards understanding gender in CSA, this subject has neither been adequately nor appropriately addressed. Ultimately, all three pillars of CSA need to be gender smart as well, by being gender transformative and gender responsive (Collins, 2017).

Additionally, CSA adoption by smallholder farmers in a changing climate needs to be considered within DRR. This is important given that DRR is the first line of defence in climate change adaptation (CCA) (Ban, 2008). Furthermore, FAO (2013) highlighted that at the implementation level, smallholder farmers may not distinctively delineate between DRR and CCA. Thus, the interconnectedness of DRR and CCA in disaster-prone regions lies in building resilience and adaptation of livelihoods in a changing climate. Such association may be harnessed to create synergies for DRR and CSA in smallholder farming.

### 3. Methods and materials

#### 3.1 Study areas

The study was conducted in two disaster-prone districts, namely Chikwawa in Malawi and Gwembe in Zambia. Chikwawa district (Figure 1) is found in Southern province, in the Lower-Shire valley's Ngabu Agricultural Development Division. The region is

characterised by a high prevalence of poverty and vulnerability to climate change (Coulibaly, 2015).

Agriculture is dominantly rain-fed smallholder agriculture and irrigation. Projected negative climate change impacts include increased disasters, such as floods, droughts, pests and diseases (Mudege *et al.*, 2017). Erratic rainfall ranges from a low of 170 mm to high of 970 mm, and mean monthly temperature exceeds 20°C (Joshua *et al.*, 2016).

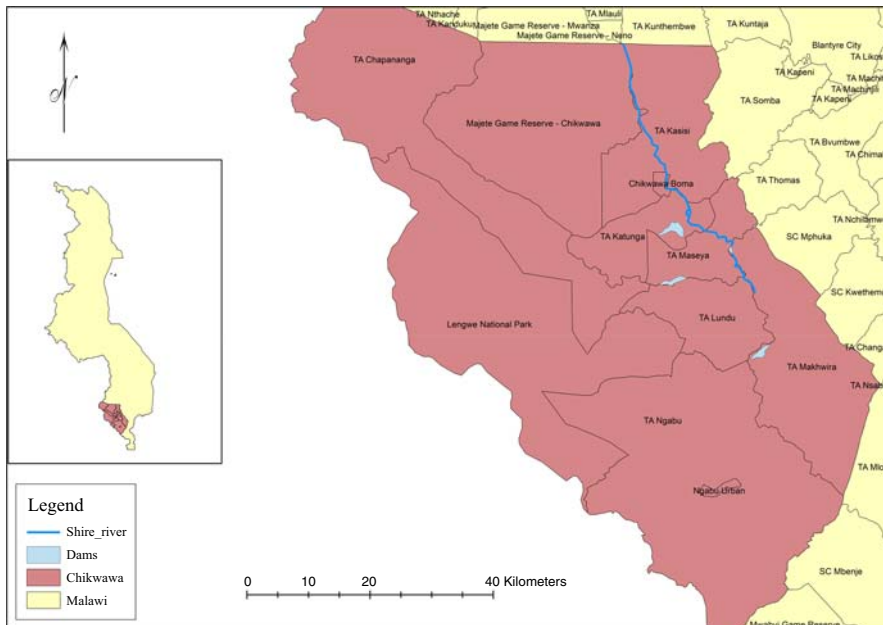
Gwembe district (Figure 2) is situated in Zambia’s middle-Zambezi Valley region in Southern province in Agro-ecological Region 1, with 800 mm annual rainfall and most vulnerable to droughts. Rain-fed smallholder agriculture and fisheries are the major livelihood activities (GRZ, 2005). Thus, selection of these two disaster-prone districts was because smallholder farmers are already experiencing climate-related disasters and CSA has been promoted in both.

### 3.2 Research design

The gender focus of the study necessitated an exploratory-sequential mixed methods research design where both qualitative and quantitative data were collected sequentially within the same study (Creswell, 2014; Johnson and Onwuegbuzie, 2004). The first phase of qualitative data collection provided themes with subsequent inquisition of identified themes through quantitative data collection.

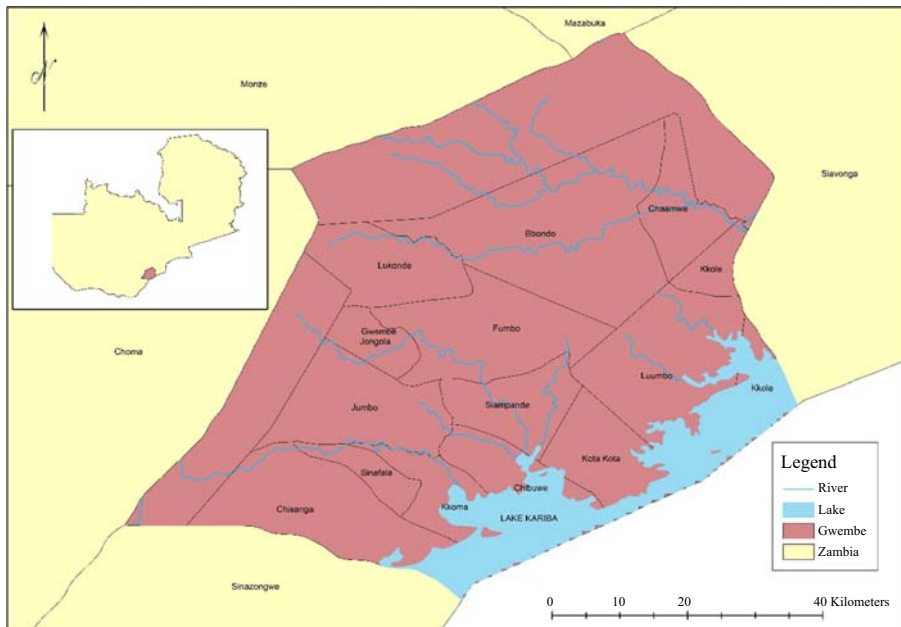
### 3.3 Data collection and instrumentation

Data collection in both study sites enlisted help from trained local research teams. Qualitative data were collected from a total of 16 key informants at the district level in Malawi and Zambia. A total of six FGDs, each with an average of nine people, were conducted, three per country (one women only, one men only and one mixed group). FGDs are in-depth discussions among people of similar backgrounds which give understanding of their social issues and are facilitated by skilled moderators (Hennink, 2013). From both key



**Figure 1.**  
Map of Chikwawa district

**Figure 2.**  
Map of Gwembe district



informant interviews (KIIs) and FGDs, the quantitative household cross-sectional survey was developed. A questionnaire was designed and pilot tested in both study sites. Subsequently, information on household demographics, CSA adoption status and supporting explanations were collected from households.

### 3.4 Sampling

Sequential mixed methods sampling strategies were used in the study where purposive sampling and probability sampling were sequentially employed for qualitative and quantitative data collection, respectively (Creswell, 2014). Different respondents were used in each phase of data collection, enabling the triangulation of perspectives on CSA adoption.

### 3.5 Data analysis

Sequential mixed data analysis was conducted where thematic analysis (Teddlie and Tashakkori, 2009) of qualitative data was conducted first. Thematic analysis ensured that dominant characteristics typifying farmer profiles in each adoption category were pervasively described. Descriptive analysis was conducted on quantitative data to establish frequencies and patterns of relationships between dependent and independent variables (Creswell and Creswell, 2017).

## 4. Findings

In both countries, characteristics of different farmer typologies in each CSA adoption category were established. CSA technologies common between both sites included conservation agriculture (CA) (mainly basin in Chikwawa and both basin and mechanised in Gwembe), improved seed varieties and livestock improvement. Irrigation schemes were unique to Chikwawa, while unique to Gwembe were energy-saving stoves and aquaculture, although the implementation of the latter was not fully underway.

#### 4.1 Gender dimensions in CSA

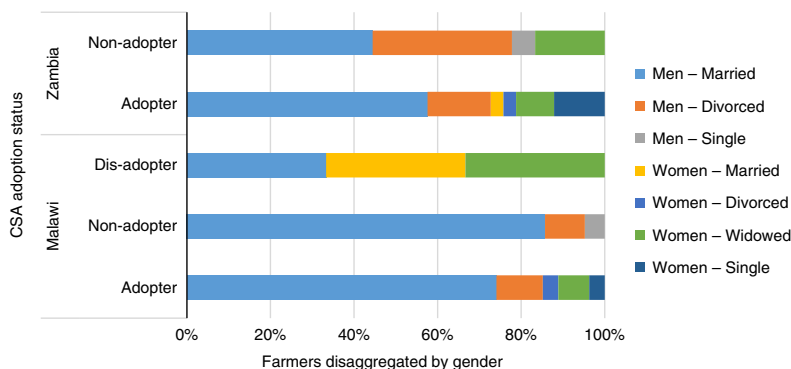
Findings of gender dimensions in CSA highlighted three major themes: local contextualisation, institutional provisions and gender-differentiated participation in CSA.

**4.1.1 Local contextualisation of gender.** Perspectives emerging during interviews of the wide spectrum of practitioners in both countries displayed mixed understanding on gender in CSA adoption. In all six FGDs, both men and women articulated their understanding of gender as cooperation between men and women. In Malawi, in both women only and mixed FGDs, women stated that they needed to work with men because some of the CSA technologies required physical strength. An example of men and women working together was shared in the management of a Fall armyworm *Spodoptera frugiperda* infestation in Chikwawa from December 2016 and was still being controlled at time of data collection in February 2018. In FGDs in Gwembe, women shared how drinking beer was affecting gender roles in farming, as men spent a lot of their time drinking beer and were unavailable to work together with women. Thus, although drinking beer is a non-agricultural activity *per se*, it may have a bearing on agricultural decision making and cannot be dismissed lightly. The significance of beer in Gwembe has been studied before (Bennett, 1990; Cliggett, 2007). In previous studies, the gender context was framed around beer brewing as an income source for women with men being consumers. The emerging concern raised by women in this study is relatively new in the gender and CSA context in Gwembe. Imperatively, the case of drinking beer in Gwembe presents opportunity for future studies to explore other emerging non-agricultural activities that could be affecting CSA adoption by smallholder farmers in disaster-prone regions.

**4.1.2 Institutional provisions for gender mainstreaming.** In both countries, the study established that there were government personnel under respective line ministries at district level mandated with mainstreaming gender in development projects. In Malawi, the Ministry of Agriculture, Irrigation and Water Development has an Agricultural Gender Roles Extension Support Services Officer and a District Gender Officer under the Ministry of Gender, Children, Disability and Social Welfare. In Zambia, the Ministry of Gender and Community Development has staff members who also work in CSA projects. Various non-governmental organisations (NGOs) interviewed also highlighted that they mainstream gender in their programmes. Both government and NGO institutions in the two sites indicated that ensuring gender mainstreaming in agriculture was one of their core functions. However, while this may indicate commitment for gender mainstreaming at institutional level in the respective governments, extent to which gender mainstreaming activities are implemented at smallholder farmer level in CSA still needs further exploration.

**4.1.3 Gender-differentiated participation and CSA adoption status.** Qualitative findings indicated that a majority of CSA adopters were men. However, there were deliberate strategies by government departments and NGOs to specifically target women in both countries in order to increase their participation. There were views that women were not fully exploiting opportunities presented to them. Quantitative findings indicated that in both Chikwawa and Gwembe districts, a majority of CSA adopters were married men (Figure 3), with less than 15 per cent women adopters in Chikwawa and less than 30 per cent in Gwembe. Widows, divorced and single women adopted CSA technologies in both sites. In Gwembe, there were few cases of married women who were stand-alone CSA adopters. These were women who practiced CSA on land apportioned by their husbands. In other cases, married women received energy-saving stoves distributed by an NGO. Although a fish-farming project targeting at least 50 per cent women was underway in Gwembe, the survey established that women had not registered at that time. In Chikwawa, men were the only non-adopters, while more women were likely to dis-adopt CSA.

**Figure 3.**  
CSA adoption status  
in different farmer  
categories



This can be attributed to the NGO targeting criteria which focuses on vulnerable women to adopt any given CSA technology.

Thus, quantitative findings substantiated the qualitative findings which stated that men were the major adopters and less women were participating in CSA. These findings established that regardless of marital status, generally more men were likely to adopt CSA than women, thus, consistent with existing literature (Doss and Morris, 2000; Murage *et al.*, 2015).

#### 4.2 Underlying factors in CSA adoption

An assessment of gender in CSA adoption would be insufficient without the further exploration of underlying socio-cultural issues shaping gender.

**4.2.1 Lack of education as a disadvantage to women adopting CSA.** During KIIs and FGDs, education level emerged as a key characteristic influencing CSA adoption. In both sites, women were said to be less educated than men because they had less opportunities to access education in comparison to men. The extent to which education was likely to affect women's adoption of CSA was explained by some respondents as captured below:

Men are better educated and more literate [...] (KII Zambia).

Literate people [...] men can better adopt CSA (FGD mixed Malawi).

Farmer profiles showed that CSA adoption occurred across education backgrounds, although the majority of adopters in both sites were married men with primary school level education. Due to deliberate targeting by NGO projects, women of various education backgrounds were adopters, although majority had either never been to school or attained education up to primary school level. Other adoption studies carried out in similar regions have highlighted how education level influences adoption (Manda *et al.*, 2016).

**4.2.2 Intra-household decision making.** In both KIIs and FGDs, respondents reiterated that intra-household dynamics of decision making influenced who was likely to adopt CSA. Men were generally main decision makers on being CSA adopters, dis-adopters or non-adopters. Women could only make decision in cases of *de jure* female household heads (HHs) with the outright absence of an adult man to lead decision making. Where an adult male relative was present within household (such as brother, son or grandson), the woman consulted him and would likely to adopt his opinion on adoption. While men were main decision makers, women were said to be primary implementers of men's decisions. The following responses highlight some of the common views:

Men are dominant in discussions and engagements as decision makers, women are primary actors and implementers of the decisions made by men (KII Malawi).

Man is the primary decision-maker [...] his choice to consult and involve his wife [...] may decide not to adopt CSA. Decision-making is easier for female-headed households, although they may have challenges in putting together the adequate resources required (KII Zambia).

The men decide [...] leaving women to cope with even the unfavorable decisions (KII Zambia).

Quantitative findings as shown in the different farmer profiles substantiated views from qualitative findings as they indicated that different groups of men, regardless of marital status, were decision makers where household adopted (total of 85 and 73 per cent in Chikwawa and Gwembe, respectively) or did not adopt (total of 100 and 83 per cent in Chikwawa and Gwembe, respectively) CSA. *de jure* female HHHs were primary decision makers in adoption, discontinuing or non-adoption. In discontinuing or non-adoption of CSA, *de jure* female HHHs stated that they consider the availability of resources and assets required in CSA.

**4.2.3 Wealth status.** Respondents from both KIIs and FGDs stated that CSA adoption was also influenced by one's wealth status. FGDs participants indicated that factors considered in wealth classification were livestock, food security, income sources and productive assets. The following statements indicate some of the perspectives on wealth:

Women are poor and don't have large tools (KII Zambia).

Some CSA technologies require someone who is better off (KII Malawi).

We target the very poor widows who are most vulnerable (KII Malawi).

Qualitative findings indicated that generally very poor *de jure* female HHHs were primary target of CSA projects. However, quantitative findings as presented in Section 4.3 were divergent. The household survey established that these groups of women often face challenges that hinder adoption, such as lack of productive assets. These findings are consistent with similar findings made by Makate *et al.* (2018) in their quantitative study conducted in Mozambique.

**4.2.4 Land tenure and ownership.** In both study sites, qualitative findings indicated that land ownership was determined by customary provisions. In patrilineal societies, men owned land, while in matrilineal, the converse was true. Although matrilineal communities exist in both countries, patrilineal system was dominant in both sites (Mwambene, 2010; GRZ, 2005). Thus, men owned land and had general oversight of decision making on its utilisation, including for CSA. In cases where women owned land, it was widows whose in-laws had not dispossessed her of the late husband's land. In FGDs in Zambia, men explained issues considered in handling property inheritance rights for widows:

The land is owned by the men [...] our main field will always take priority for inputs and labour then after she can go and do as she pleases on her piece [...] (Men only FGD Zambia).

Land is owned by men, women are taken on board [...] when a man dies the woman may be sent back to her village and her husband's land taken away [...] this leaves her vulnerable [...] (KII Zambia).

In Zambia, it was common that husbands allocate their wives a piece of land for farming and this is similar to study findings by GRZ (2005). The land still remained of the husband, but the wife could exercise general oversight of agricultural activities. As such, although married women could claim land ownership, it was actually access to land through usufructuary rights. Land ownership for married women is seem to be different from women who are *de jure* HHHs. A woman could own land if she was single and had children, then her father or brother apportioned a piece so she could farm on it. Where a marriage ceased to exist, the woman lost out on the land she would have been farming on while married. She could, however, be allocated land by either her brother or father upon



return to her father's home. Land ownership patterns established in the qualitative phase were consistent with other similar studies (Mango *et al.*, 2017) and quantitative findings illustrated in Section 4.3 corroborated.

*4.2.5 Ownership of production assets.* Qualitative findings indicated that generally men owned productive assets. In some cases, productive assets owned could be used in CSA, for example, oxen for draught-power in mechanised CSA. Some of the responses gathered during KIIs and FGDs are shared as follows:

We need to strive for fair distribution of resources (KII Malawi).

Men own almost everything (FGD mixed Zambia).

Married men owned major productive assets, such as large farm equipment, livestock and in the case of Zambia, men also owned fishing equipment. Women could only own major productive assets if they were *de jure* female HHHs and had inherited assets from the late husband. Major productive assets required huge investment; hence, men were likely to lead such an investment decision.

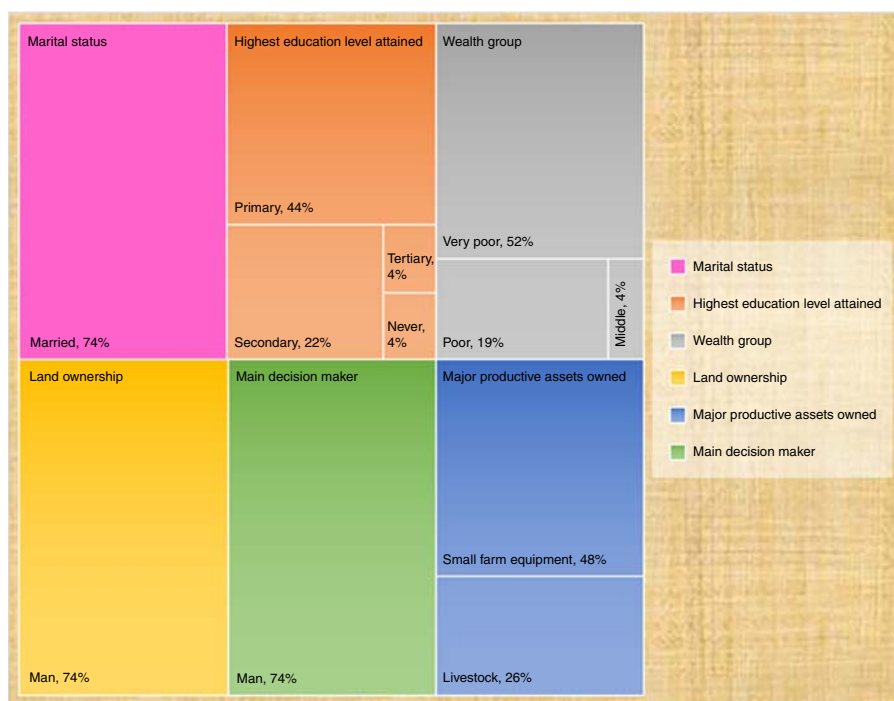
Quantitative findings outlined in Section 4.3 were consistent with responses from KIIs and FGDs. Findings showed that generally women were likely to own small farming tools, indicating consistency with findings from a similar study by Murray *et al.* (2016). For example, in Chikwawa, married women did not own any productive assets and this may be suggested as reason that divorced women only own small livestock and small farming equipment acquired post-marriage. This is evidence of unfair distribution of resources that need addressing, as stated by one interviewee. Thus, consistent with studies conducted elsewhere (Murage *et al.*, 2015; Farnworth *et al.*, 2016) in terms of productive assets ownership in both study sites, women across marital statuses owned fewer and lower quality productive assets compared to men.

#### *4.3 Profiles of farmers in CSA adoption status*

In both study sites, KIIs and FGDs revealed farmer characteristics in each CSA adoption category were determined by gender, marital status, education, wealth, decision-making power, ownership of productive assets and land tenure systems. This corroborates with similar adoption studies (Manda *et al.*, 2016; Mango *et al.*, 2017) that highlight the same as factors influencing adoption decision, although these studies were not looking at gender specifically.

*4.3.1 Adopters profiles.* The tree-map charts (Figures 4 and 5) illustrate characteristics of majority of CSA adopters in Chikwawa and Gwembe, respectively. In both sites, these were predominantly married men, 74 per cent in Chikwawa and 58 per cent in Gwembe. In Chikwawa, these adopters own land, hand-hoes, livestock including a few goats and cattle. These married men were decision makers in CSA and were said to rarely consult or consider their wives' views.

In all, 44 per cent adopters in Chikwawa attained primary education, 22 per cent secondary education, and a total of 6 per cent had either tertiary education or had never been to school. CSA adopters who had tertiary education were male locals who were formally employed and were middle class in terms of local wealth classification indicated during FGDs. Middle-class married men were CSA adopters in small-scale irrigation schemes where they rented plots from very poor plot-holders. In all, 11 per cent of adopters in Chikwawa were very poor *de jure* female HHHs who had never been to school. These women owned land, hand-hoes, chickens and decided on their own to adopt CSA. Additionally, a majority of adopters in Gwembe owned large farm implements, such as ox-drawn ploughs, and in fishing communities, they also owned fishing equipment. CSA adopters in Gwembe included those farmers described by the community as better off/rich, owning many cattle and large farming equipment and could practice mechanised CA. Only a



**Figure 4.**  
Adopters' profile,  
Chikwawa

small proportion of CSA adopters in Gwembe had never been to school and these were either married or divorced men.

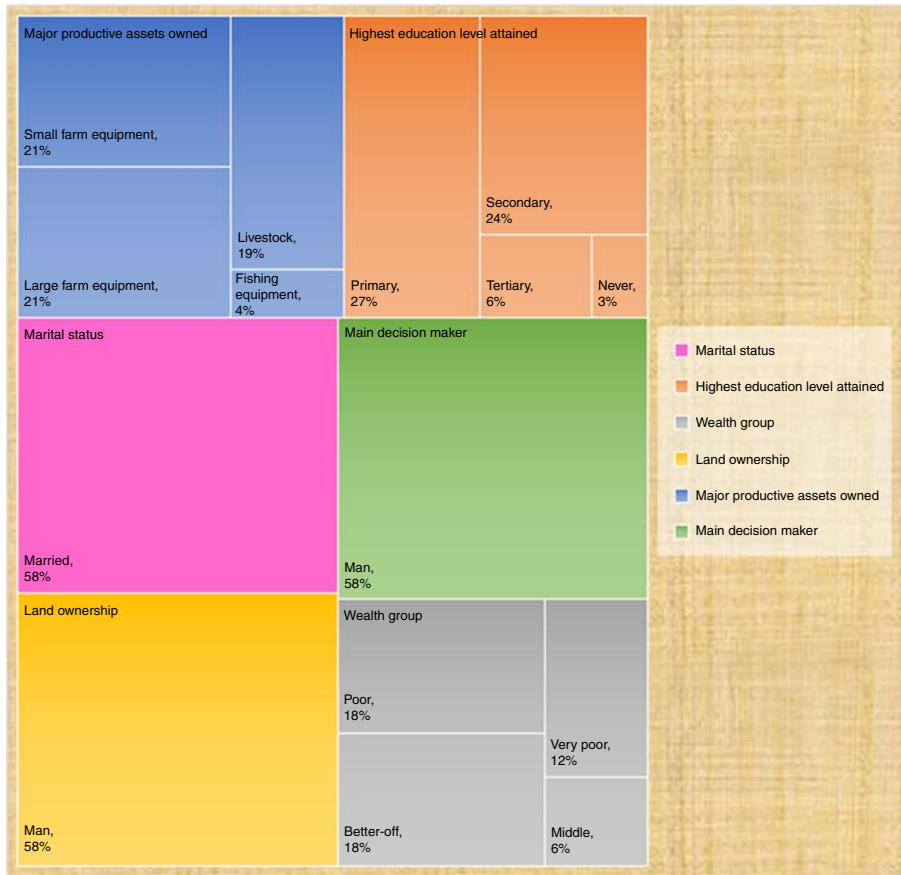
Majority of *de jure* female HHHs CSA adopters had attained secondary education, although there were some who attained tertiary education. These were mainly retired government employees. Notably, in Gwembe, there were married women who made decision to adopt CSA. This was the case concerning energy-saving stoves which improved their reproductive role of cooking, and CA in cases where a woman was apportioned land by the husband. Cultures in both sites place decision making as a men's function and such findings corroborated with similar study conducted by Murray *et al.* (2016) and GRZ (2005).

*4.3.2 Non-adopters' and dis-adopters' profiles.* Figure 6 illustrates the composition of non-adopters in Chikwawa, 86 per cent of whom were married men, and there were no *de jure* female HHHs in this group. These married men were major decision makers on the non-adoption of CSA, although they owned land on which they could practice technologies such as CA. A lack of adequate resources was cited as their major challenge as majority of them were very poor (67 per cent) and owned small farming equipment and small livestock. These married men had either attained primary education or had never been to school at all, thus they felt they did not possess required education levels for CSA adoption.

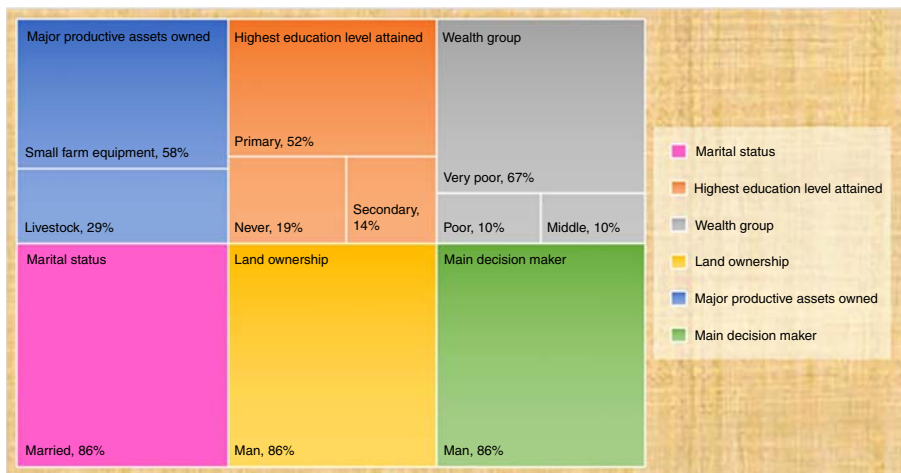
The composition of Gwembe non-adopters (Figure 7) was slightly different as it included 44 per cent married and 33 per cent divorced men, as well as 17 per cent widows. In all, 11 per cent of widows had never been to school and thus felt they did not possess background education that could be applied in CSA practice. Another challenge faced by widows was the lack of adequate farming tools and they all belonged to the poor category as defined by community during FGDs. Although 17 per cent actually indicated

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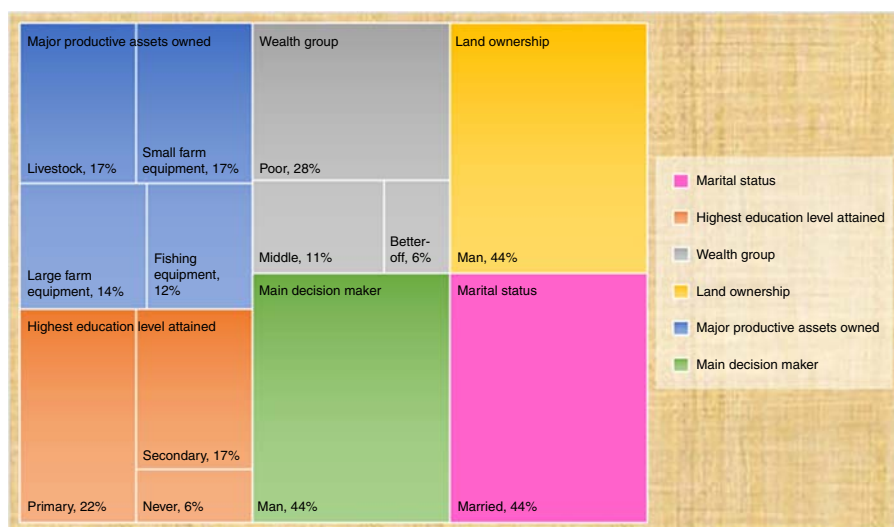
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**Figure 5.**  
Adopters' profile,  
Gwembe



**Figure 6.**  
Profile of non-  
adopters, Chikwawa



**Figure 7.**  
Profile of non-adopters, Gwembe

ownership of land, only 9 per cent of them owned productive assets that could be used in CSA.

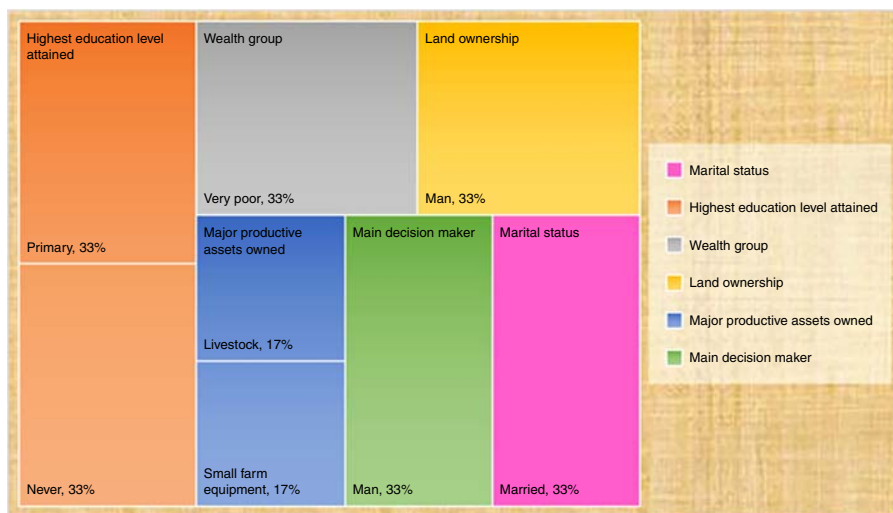
The men non-adopters in Gwembe were essentially equipped to adopt any of the CSA technologies. Almost 12 per cent owned fishing equipment and felt CSA technologies currently promoted were not relevant for them as their livelihoods were more dependent on the fish value chain. Interestingly, while a project is underway that seeks to promote women's participation in aquaculture, this study showed that ownership of fishing equipment was not typical for women. Hence, findings from the men only FGD were that women only owned small fishing rods for catching small fish in the lake's shallow peripheral waters were substantiated. For women, fishing was mainly for household consumption, although for married women, their spouses could decide to involve them in fish trading.

Dis-adoption was only encountered in Chikwawa (Figure 8), where 66 per cent of dis-adopters were women, 33 per cent married and 33 per cent widowed. These women were very poor, had either attained primary education or had never been to school. In case of married women, decision making on dis-adoption was taken by the husband, while widows made the decision in consultation with adult male relatives. Women dis-adopters who were married did not own the land, thus even if they saw benefits of CSA if the husband decided to stop practicing the technology they had to comply with his decision.

These findings converged with findings from KIIs and FGDs that stated women were the primary target of CSA interventions by NGOs and because of resource constraints were likely to stop practicing CSA once project support ended.

## 5. Discussion

Findings provide critical insights into gender-differentiated profiles of adopters, dis-adopters and non-adopters of CSA. Heterogeneity exists among men and women; thus, this paper submits that approaches focusing only on male/female gender binaries are both passé and insufficient to address gender issues in CSA adoption. Men and women smallholder farmers exist in complex local realities marked by socio-cultural factors which interact to influence adoption as established by the study. Theoretically, the study was underpinned by feminist theories of gender mainstreaming. Findings shared in the paper indicate the



**Figure 8.**  
Dis-adopters' profile,  
Chikwawa

application of WID and GAD to eliminate patriarchal privilege and women's subordination,; for example, when energy-savings stoves distribution specifically targets women only. However, this also may be an indication of bias towards addressing practical gender needs. Qualitative findings at local district level highlight perceptions that gender issues have fizzled out (Davis, 2008) and gender mainstreaming in CSA simply fulfils donor requirements. Sentiments that Western gender approaches were not fully applicable to local contexts were echoed throughout the study. This paper argues that while there is progress in women's empowerment through traditional gender frameworks, gaps still remain especially in addressing strategic gender needs.

Traditional gender mainstreaming has been criticised for its paradoxical failure to give voice to the women it purports to give voice to (Chilisa and Ntseane, 2010). In the study, this was observed in contrast between local perceptions of gender and its classical definition applied in CSA. Communities, including women who were given a voice in this study, while acknowledging patriarchal dominance and women's disadvantaged position, view gender as men and women working collaboratively. This corroborates with literature (Kolawole, 2004; Nnaemeka, 2004). Thus, this paper submits that for farmer profiles to be understood in CSA adoption, the contextualisation of gender must consider local realities. Subsequently, gender mainstreaming approaches will be tailored to address relevant practical and strategic gender needs. This paper argues that when local realities are considered, CSA will respond to issues of a non-agricultural nature which affect intra-household decision making. For example, how treadle pumps in Chikwawa and beer drinking in Gwembe affect matrimonial relations and adoption decision making.

Local contextualisation of gender draws attention to socio-cultural factors such as patriarchy and women's disadvantaged position, and how this compromises CSA adoption. For example, customary marriages place ownership of most of productive assets required in resilience and adaptation under men. Women have limited asset ownership, with access to land and productive assets predominantly through usufructuary rights in marriage (GRZ, 2005; Murray *et al.*, 2016). Based on study findings women are likely to lose major productive assets upon death of husband or collapse of marriage, and similar findings have been made by studies on land ownership and women (Brown and Siamwiza, 2002). However, as established in the study, divorced men retained assets from the marriage, evidence of

gender disparity. Although customary laws govern property ownership, even existing legal framework has gaps, further magnifying women's plight (Keller, 2000).

Findings from the study also showed that productive asset base determined decision making by different types of farmers. At the core of decision making were intra-household power relations. Women in either *de facto* female-headed or male-headed households have limited decision making in CSA adoption. While *de jure* female HHHs may independently make decisions, the implementation of adoption decisions is constrained by lack of ownership, access to and control of land and other productive assets (Farnworth *et al.*, 2016). Therefore, this paper posits that the empowerment of women in decision making should be supported with substantial strategies to improve ownership of land and other productive assets to improve CSA adoption.

The study also established that adoption decisions were also influenced by farmers' literacy and education levels. Majority of women in the study were less educated than men thus did not adopt CSA. CSA is knowledge intensive (WBG *et al.*, 2015); thus, this paper suggests that to improve CSA adoption, capacity-building strategies should be inclusive to people of all education and literacy levels. Accordingly, CSA may tap into local capacities; for example, in Zambia, findings showed that within adopters' category, there were a few *de jure* female HHHs who were also retired professionals. Such women could be used as lead farmers, and CSA trainings custom made to suit specific women needs according to farmer profiles.

Intersectionality and AFs may enrich understanding of gender in CSA as they recognise heterogeneity of social groups, unequal power relations within groups, individuals belonging to more than one social group, consideration of local contexts and realities (Arndt, 2002; Arora-Jonsson, 2011; Carr and Thompson, 2014), all of which were established by this study. As men and women farmers experience climate change, they engage in practices and decision making to renegotiate complex contexts (Kajiser and Kronsell, 2014). This is key in understanding complexities of African smallholder farmers, as not all men or women by simply falling into same gender group will have same adaptation and resilience-building requirements. Other factors may intersect with gender; for example, empirical evidence from the study showed gender intersecting with marital status, education, asset ownership, wealth and cultural norms. Therefore, this paper accentuates potential benefits of innovative blend of both contemporary and classic gender approaches to address underlying socio-cultural issues to improve CSA adoption for DRR. Furthermore, by incorporating AFs and intersectionality in CSA adoption by SHFs, this study proposes gender policy reforms informed by local gender contexts within the African socio-cultural milieu. This may be achieved by harnessing strengths of contemporary gender paradigms to mitigate weaknesses of traditional gender approaches as espoused in this paper.

## 6. Conclusions

The study examined gender-differentiated profiles of smallholder farmers who are adopters, dis-adopters and non-adopters of CSA. Furthermore, underlying socio-cultural factors shaping real-life experiences of farmers thereby influencing their adoption decisions were explored. The heterogeneity of farmer profiles and complexity of socio-cultural milieu within which CSA adoption should occur demand more inclusive and diversified strategies and policies tailor made for farmers. While contemporary gender paradigm cannot single-handedly address pervasive gender issues in CSA, this paper proposes an integrated approach. Integrating traditional and contemporary gender approaches paves a way for the inclusion and consideration of multifaceted local contextual realities that frame farmer profiles. Thus, CSA adoption can be improved by a holistic approach and future gender-focused CSA adoption studies should explore engendering DRR models and formulation of context-specific, gender-sensitive adoption framework.

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## References

- Akin-Aina, S. (2011), "Beyond an epistemology of bread, butter, culture and power: mapping the African feminist movement", *Nokoko*, Vol. 2, pp. 65-89.
- Andersson, J.A. and D'Souza, S. (2014), "From adoption claims to understanding farmers and contexts: a literature review of conservation agriculture (CA) adoption among smallholder farmers in southern Africa", *Agriculture, Ecosystems & Environment*, Vol. 187, pp. 116-132.
- Arndt, S. (2002), "Perspectives on African feminism: defining and classifying African-feminist literatures", *Agenda*, Vol. 17 No. 54, pp. 31-44.
- Arnfred, S. (2004), "Re-thinking sexualities in Africa", Nordic Africa Institute, Uppsala.
- Arora-Jonsson, S. (2011), "Virtue and vulnerability: discourses on women, gender and climate change", *Global Environmental Change*, Vol. 21 No. 2, pp. 744-751.
- Asfaw, S., Bishop-Sambrook, C., Diei, Y., Firmian, I., Henninger, N., Heumesser, C., Huyer, S., Kristjanson, P., Lefter, C. and Lehel, S. (2015), *Gender in Climate-Smart Agriculture: Module 18 for Gender in Agriculture Sourcebook*, World Bank Group, Washington, DC.
- Ban, K. (2008), "Risk reduction and climate change", speech by the United Nations Secretary-General, UN Headquarters, New York, NY.
- Bennett, L.A. (1990), "For prayer and profit: the ritual, economic, and social importance of beer in Gwembe District, Zambia, 1950-1982. ELIZABETH COLSON and THAYER SCUDDER", *American Ethnologist*, Vol. 17 No. 3, pp. 574-575.
- Beuchelt, T.D. and Badstue, L. (2013), "Gender, nutrition and climate-smart food production: opportunities and trade-offs", *Food Security*, Vol. 5 No. 5, pp. 709-721.
- Brown, T. and Siamwiza, B. (2002), "Chiefs, commoners, and enclosures in the Gwembe Valley, Zambia", paper presented at the 9th Conference of the International Association for the Study of Common Property, Victoria Falls, 17-21 June.
- Carr, E.R. and Thompson, M.C. (2014), "Gender and climate change adaptation in agrarian settings: current thinking, new directions, and research frontiers", *Geography Compass*, Vol. 8 No. 3, pp. 182-197.
- Chilisa, B. and Ntseane, G. (2010), "Resisting dominant discourses: implications of indigenous, African feminist theory and methods for gender and education research", *Gender and Education*, Vol. 22 No. 6, pp. 617-632.
- Cliggett, L. (2007), "Gendered support strategies of the elderly in the Gwembe Valley, Zambia", in Chet, L., Kenneth, P. and Vickery, E. (Eds), *Tonga-Speaking Peoples of Zambia and Zimbabwe: Essays in Honor of Elizabeth Colson*, University Press of America, MD, pp. 219-236.
- Collins, A. (2017), "Saying all the right things? Gendered discourse in climate-smart agriculture", *The Journal of Peasant Studies*, Vol. 45 No. 1, pp. 1-17.
- Coulibaly, A.S. (2015), "Theorizing and categorizing African feminism within the context of African female novel", *Recherches Africaines*, Vol. 13 No. 15, pp. 1-23.
- Creswell, J.W. (2014), *A Concise Introduction to Mixed Methods Research*, Sage Publications, Thousand Oaks, CA.

- Creswell, J.W. and Creswell, J.D. (2017), *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, Sage Publications, Thousand Oaks, CA.
- Davis, K. (2008), "Intersectionality as buzzword: a sociology of science perspective on what makes a feminist theory successful", *Feminist Theory*, Vol. 9 No. 1, pp. 67-85.
- Doss, C.R. and Morris, M.L. (2000), "How does gender affect the adoption of agricultural innovations? The case of improved maize technology in Ghana", *Agricultural Economics*, Vol. 25 No. 1, pp. 27-39.
- FAO (2013), *Climate-Smart Agriculture Sourcebook*, Food and Agriculture Organisation of the United Nations, Rome.
- Farnworth, C.R., Baudron, F., Andersson, J.A., Misiko, M., Badstue, L. and Stirling, C.M. (2016), "Gender and conservation agriculture in East and Southern Africa: towards a research agenda", *International Journal of Agricultural Sustainability*, Vol. 14 No. 2, pp. 142-165.
- Glover, D., Sumberg, J. and Andersson, J.A. (2016), "The adoption problem; or why we still understand so little about technological change in African agriculture", *Outlook on Agriculture*, Vol. 45 No. 1, pp. 3-6.
- GRZ (2005), "Baseline survey on women's access to agricultural land in Zambia", Gender in Development Division, Lusaka.
- Hennink, M.M. (2013), *Focus Group Discussions*, Oxford University Press, New York, NY.
- Johnson, R.B. and Onwuegbuzie, A.J. (2004), "Mixed methods research: a research paradigm whose time has come", *Educational Researcher*, Vol. 33 No. 7, pp. 14-26.
- Joshua, M.K., Ngongondo, C., Chipungu, F., Monjerezi, M., Liwenga, E., Majule, A.E., Stathers, T. and Lamboll, R. (2016), "Climate change in semi-arid Malawi: perceptions, adaptation strategies and water governance", *JAMBÁ: Journal of Disaster Risk Studies*, Vol. 8 No. 3, pp. 1-10.
- Jost, C., Kyazze, F., Naab, J., Neelormi, S., Kinyangi, J., Zougmore, R., Aggarwal, P., Bhatta, G., Chaudhury, M. and Tapio-Bistrom, M.-L. (2016), "Understanding gender dimensions of agriculture and climate change in smallholder farming communities", *Climate and Development*, Vol. 8 No. 2, pp. 133-144.
- Kaijser, A. and Kronsell, A. (2014), "Climate change through the lens of intersectionality", *Environmental Politics*, Vol. 23 No. 3, pp. 417-433.
- Keller, B. (2000), "Women's access to land in Zambia", International Federation of Surveyors Commission 7: Cadastre and Land Management, Taskforce on Women's Access to Land, Köln.
- Kolawole, M. (2004), "Re-conceptualizing African gender theory: feminism, womanism and the arere metaphor", in Arnfred, S. (Ed.), *Re-Thinking Sexualities in Africa*, Nordic Africa Institute, Uppsala, pp. 251-266.
- Lei, Y. (2014), "A preliminary discussion on the opportunities and challenges of linking climate change adaptation with disaster risk reduction", *Natural Hazards*, Vol. 71 No. 3, pp. 1587-1597.
- Lorber, J. (2010), *Gender Inequality: Feminist Theories and Politics*, Oxford University Press, New York, NY.
- Makate, C., Makate, M. and Mango, N. (2018), "Farm types and adoption of proven innovative practices in smallholder bean farming in Angonia district of Mozambique", *International Journal of Social Economics*, Vol. 45 No. 1, pp. 140-157.
- Manda, J., Alene, A.D., Gardebroek, C., Kassie, M. and Tembo, G. (2016), "Adoption and impacts of sustainable agricultural practices on maize yields and incomes: evidence from rural Zambia", *Journal of Agricultural Economics*, Vol. 67 No. 1, pp. 130-153.
- Mango, N., Makate, C., Tamene, L., Mponela, P. and Ndengu, G. (2017), "Awareness and adoption of land, soil and water conservation practices in the Chinyanja Triangle, Southern Africa", *International Soil and Water Conservation Research*, Vol. 5 No. 2, pp. 122-129.
- Mathews, J.A., Kruger, L. and Wentink, G.J. (2018), "Climate-smart agriculture for sustainable agricultural sectors: the case of Moiofontein", *JAMBÁ: Journal of Disaster Risk Studies*, Vol. 10, pp. 1-10.



- Mekgwe, P. (2006), "Theorizing African feminism(s): the colonial question", *QUEST: An African Journal of Philosophy*, Vol. 20 Nos 1-2, pp. 11-22.
- Mudege, N.N., Mdege, N., Abidin, P.E. and Bhatasara, S. (2017), "The role of gender norms in access to agricultural training in Chikwawa and Phalombe, Malawi", *Gender, Place & Culture*, Vol. 24 No. 12, pp. 1689-1710.
- Murage, A.W., Pittchar, J., Midega, C., Onyango, C. and Khan, Z. (2015), "Gender specific perceptions and adoption of the climate-smart push-pull technology in eastern Africa", *Crop Protection*, Vol. 76, pp. 83-91.
- Murray, U., Gebremedhin, Z., Brychkova, G. and Spillane, C. (2016), "Smallholder farmers and climate smart agriculture: technology and labor-productivity constraints amongst women smallholders in Malawi", *Gender, Technology and Development*, Vol. 20 No. 2, pp. 117-148.
- Mwambene, L. (2010), "Marriage under African customary law in the face of the Bill of Rights and international human rights standards in Malawi", *African Human Rights Law Journal*, Vol. 10 No. 1, pp. 78-104.
- Nelson, S. and Huyer, S. (2016), "A gender-responsive approach to climate-smart agriculture: evidence and guidance for practitioners-climate-smart agriculture practice brief", CGIAR, Copenhagen.
- Nnaemeka, O. (2004), "Nego-feminism: theorizing, practicing, and pruning Africa's way", *Signs: Journal of Women in Culture and Society*, Vol. 29 No. 2, pp. 357-385.
- Nyasimi, M., Kimeli, P., Sayula, G., Radeny, M., Kinyangi, J. and Mungai, C. (2017), "Adoption and dissemination pathways for climate-smart agriculture technologies and practices for climate-resilient livelihoods in Lushoto, Northeast Tanzania", *Climate*, Vol. 5 No. 3, pp. 1-22.
- Okali, C. (2012), "Gender analysis: engaging with rural development and agricultural policy processes", available at: <https://opendocs.ids.ac.uk/opendocs/handle/123456789/2318> (accessed 9 June 2017).
- Parpart, J.L., Connelly, P. and Barriteau, E. (Eds) (2000), *Theoretical Perspectives on Gender and Development*, IDRC, Ottawa.
- Perch, L. and Byrd, R. (2015), "Gender in the CSA discourse: making the case for gender-smartness", available at: <https://riopluscentre.org/publications/gender-in-the-csa-discourse-making-the-case-for-gender-smartness> (accessed 10 June 2018).
- Singh, S. (2007), "Deconstructing 'gender and development' for 'identities of women'", *International Journal of Social Welfare*, Vol. 16 No. 2, pp. 100-109.
- Stewart, A.J. and McDermott, C. (2004), "Gender in psychology", *Annual Review of Psychology*, Vol. 55, pp. 519-544.
- Teddle, C. and Tashakkori, A. (2009), *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*, Sage, Thousand Oaks, CA.
- Twyman, J., Bernier, Q., Muriel, J., Paz, L., Ortega, L. and Koningstein, M. (2015), "Ensuring climate-smart agriculture is gender-smart: a participatory method for local adaptation planning with a gender focus", available at: <https://hdl.handle.net/10568/65655> (accessed 20 November 2017).
- UNISDR (2004), "Living with risk: a global review of disaster reduction initiatives", available at: [www.unisdr.org/we/inform/publications/657](http://www.unisdr.org/we/inform/publications/657) (accessed 30 June 2018).
- Van Hulst, F.J. and Posthumus, H. (2016), "Understanding (non-) adoption of conservation agriculture in Kenya using the reasoned action approach", *Land Use Policy*, Vol. 56, pp. 303-314.
- WBG, FAO and IFAD (2015), *Gender in Climate-Smart Agriculture: Module 18 for the Gender in Agriculture Sourcebook*, World Bank, FAO and IFAD, Washington, DC.
- Wilson, K. (2015), "Towards a radical re-appropriation: gender, development and neoliberal feminism", *Development and Change*, Vol. 46 No. 4, pp. 803-832.

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