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Sustainable agricultural intensification and gender-biased land tenure systems: an exploration and conceptualization of interactions

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ABSTRACT

How does sustainable agricultural intensification's (SAI) tenet of increased productivity on the same area of land relate to prevailing gender-biased land tenure systems? How can one conceptualize the interactions between intensified land use and control over land, labour, crops and benefits – and how can equitable outcomes be facilitated? These questions (which have not yet received sufficient attention in SAI research) are explored in this study using a qualitative methodology and a gender-transformative approach. Semi-structured interviews and focus group discussions with a total of 248 respondents were conducted in matrilineal and patrilineal intensification contexts in Ghana and Malawi. We develop a conceptual framework that extends Kabeer's institutional analysis to include gender implications of SAI. Selected cases reveal how farmers and key actors link land use intensification to existing land-related institutions with diverse outcomes. We conclude that SAI interventions should adopt gender-transformative approaches. These facilitate equitable outcomes by supporting consensus-based institutional changes and creating positive synergies between multiple scales.

KEYWORDS

Gender; land; sustainable agricultural intensification; Ghana; Malawi

1. Introduction

One tenet of sustainable agricultural intensification (SAI) is the non-expansion of agriculture into unfarmed areas, or 'producing more output from the same area of land while reducing the negative environmental impacts', as Pretty et al. (2011, p. 7) have expressed it. This concern for non-expansion is explained by the need to give priority to the protection of biodiversity and environmental resources. Land use intensification can be achieved through increased inputs, changing to more productive crops and converting to a more productive farming system (e.g. through irrigation; Martin et al., 2018).

The concept of SAI has been the subject of controversial debates (Loos et al., 2014; Struik & Kuyper,

2017). However, SAI conceptualizations of agricultural land use have been neither generally discussed nor explicitly investigated in terms of their implications for prevailing inequitable land tenure systems. A question that has at least been broached is how land tenure security links to farmers' propensity to make SAI investments (Lawry et al., 2017). Pretty et al. mention 'legal status for land ownership' as a supportive public sector measure (2011, p. 20). Several authors assume that ownership and secure access to land could enable more smallholders (and specifically women) to participate in sustainable intensification practices (Himmelstein et al., 2016; Loos et al., 2014; Zimmerer et al., 2015).

A lack of debate on social preconditions and their interactions with SAI is also noted by critics. After an

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extensive literature review, Weltin et al. (2018) observe that SAI is an underrepresented topic in the social sciences and economics – disciplines that would be key for reaching farmers. Mahon et al. (2017) conclude that it should be a cause of concern that gender equity as an indicator was mentioned so few times in relation to SAI in their sample. Himmelstein et al. (2016) write that if SAI approaches are to justify claims of being participatory and holistic, they need, among others, a stronger focus on gendered constraints and preferences. Loos et al. (2014, p. 356) go even further by stating: ‘Without specific regard for equitable distribution and individual empowerment (distributive and procedural justice) agricultural intensification cannot legitimately claim to be “sustainable”’.

While SAI scholars have not yet explicitly engaged with the question of how farming on the same area of land could be achieved in an equitable manner, there is a general discussion on gender and access to and control of agricultural land. In an overview article on gender inequalities in ownership and control of agricultural land in Africa, Doss et al. (2015) attest to wide variations in the severity of the gender gap within and across countries. Although they urge readers to be wary of generalizations, they see that in the majority of cases women are disadvantaged as compared to men in terms of reported and documented ownership, management and decision-making in respect of land, and the size and value of the land they have at their disposal.

Some policy organizations and scholars have assumed, and produced evidence of, a causal link between insecure land rights and low productivity (Lawry et al., 2017). They see women’s secure land rights and control of outputs as an incentive to improve sustainable land management and yields, as a booster of women’s intra-household negotiation power, and as beneficial for the health and education of their children (Doss et al., 2015; Johnson et al., 2016). However, strengthening land rights alone will not suffice to remove imbalances. Scholars have pointed to other factors that can impede productivity gains, such as women’s limited access to information, inputs and credits, not forgetting their high involvement in reproductive work (Meinzen-Dick et al., 2019; Tsikata, 2009). Young women often face higher obstacles with regard to land access and ownership than young men and older women (FAO, 2014; White, 2012).

In this article we address the above outlined gap: we investigate the interactions between agricultural

land use intensification and prevailing inequitable land tenure systems and their outcomes in a broad and explorative manner. A conceptual framework is developed that links an institutional analysis (with focus on land) to the gender implications of SAI. Drawing on qualitative data from Ghana and Malawi, the topic is examined in matrilineal and differential patrilineal settings. In line with a gender transformative approach, we seek an in-depth understanding of how inequalities affect women and men. We engage with underlying norms and avenues for transformation and commit to a critical reflection of institutions including those of scientists and other development actors (Kantor, 2013). The conceptual framework introduced below reveals how concepts and assumptions were used to organize the inquiry.

2. Materials and Methods

2.1. Study approach and conceptual framework

The conceptual framework guiding this study (Figure 1) explores the way SAI interacts with land-related institutions and the outcomes from a gender perspective, using six elements of analysis. At the centre of the framework are the arenas of interaction where the processes of translating technologies and land-related institutions combine to influence gendered processes and outcomes from intensification. The processes of translating technologies are directly influenced by the cultural institutions of science in relation to SAI. Likewise, land-related institutions are influenced by the systems of norms. All of these are influenced by large-scale processes.

Our analysis below stems directly from this framework and follows three steps: Step 1 focuses on the part of the framework on the right hand side and consists of an institutional analysis with a focus on land. In Step 2 we expand the focus to the left hand side of the framework to include gender implications of SAI. Finally, Step 3 captures what respondents perceive as potential entry points for change in land-related institutions and systems of norms.

To analyse systems of norms and land-related institutions, and their outcomes, in the arenas of interaction (Step 1), we draw on concepts developed by Agarwal (1994) and Kabeer (1994). In a seminal study of gender and land rights, Agarwal (1994) named household, community, market and government as principal locations of contestation, where pulls and pressures may converge or move in opposite

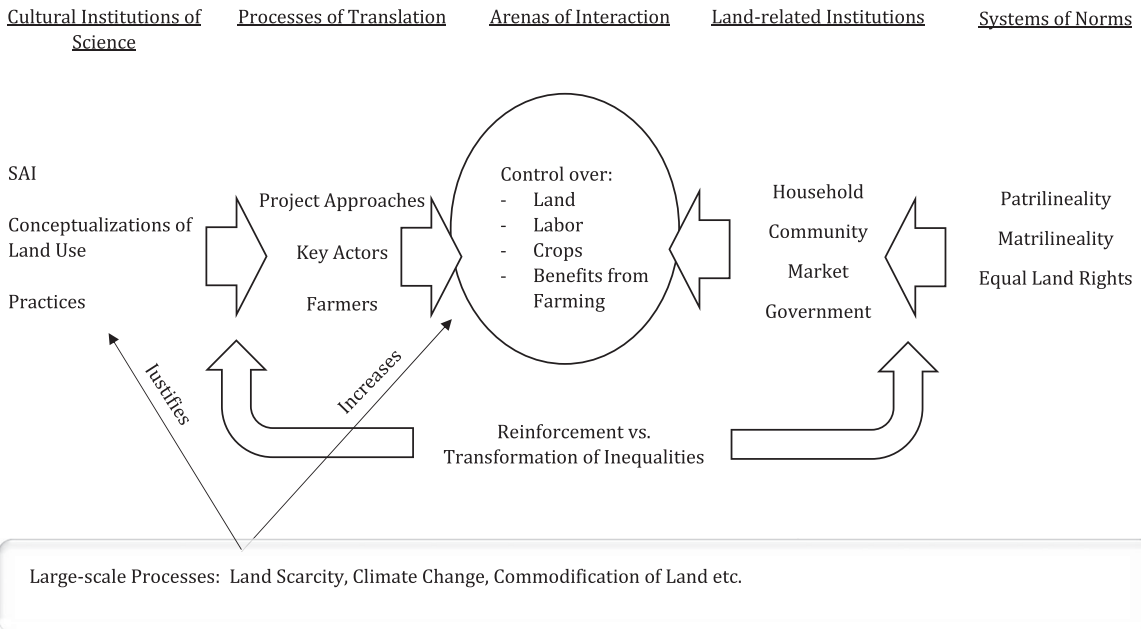


Figure 1. Conceptual framework.

directions. As ‘key institutional locations’, they constitute the basis of Kabeer’s concept of institutional analysis (1994, pp. 279–285), as part of the Social Relations Approach to gender analysis (March et al., 1999). In this study we see systems of norms, such as matrilineality, patrilineality, or equal land rights approaches, as underlying land-related institutions in the four key institutional domains. Institutions (as norms, rules and practices) shape gender relations and their outcomes in the arenas of interaction, in our case control over land, labour, crops and benefits. Each institutional domain has internal dynamics as well as interactions with other domains. As March et al. (1999) explain, changes in one institution will cause changes in other institutions. For emerging gender-transformative approaches (GTAs), Kabeer’s concept has regained relevance in terms of inspiring synergies across multiple scales for sustainable gender transformation. GTAs shift focus from measuring and addressing symptoms of inequality (such as access to land) to tackling the institutions that engrain and perpetuate it (Wong et al., 2019). Convergent and contradictory institutional rules may not only generate and maintain imbalances, but may also provide avenues for change. In this paper we explore these from respondents’ perspectives (Step 3).

Kabeer writes that an institutional analysis is only useful, if ‘linked to the design and evaluation of

policy and planning’, and she emphasizes the need to assess the gender implications of new technologies in specific institutional contexts (1994, pp. 285–286). In our study we establish this link by exploring the gender implications of SAI interventions and their technologies (Step 2). The respective components in the conceptual framework are cultural institutions of science in relation to SAI, processes of translation, and how they shape outcomes in the arenas of interaction. Although often invisible, cultural institutions of science underlie SAI conceptualizations of land use (as expressed in certain technologies). For instance, Erb et al.’s (2013, p. 5) framework for analysing and measuring land-use intensity contains three dimensions: inputs to land (capital, labour, skills, etc.), outputs from land (production, services), and ‘human-induced, but unintended outcomes of land-use intensification that are best measured at the system level’. Although the authors speak of socio-ecological systems, unintended outcomes are related to bio-physical aspects only. Martin et al. (2018) define land use intensification as activities undertaken to enhance the productivity or profitability per unit area of land. Four types of land use intensification are distinguished: land use conversion (e.g. from rain-fed to irrigated farming), increased inputs (e.g. chemicals, machinery, labour, new knowledge and skills), crop or product change (e.g. higher-yielding

varieties), or a complex combination of these as mixed intensification. The authors identify socio-cultural values and social outcomes as part of the intensification process, but leave them to future research. Climate change and economic globalization are seen as 'indirect global drivers' – a component we have termed large-scale processes in our conceptual framework. Looking at the above conceptualizations of intensified land use under SAI, it is apparent that social outcomes are considered, but a gender analysis of labour, access to inputs and land (as well as the social institutions they are embedded in) goes unmentioned.

The value of insights from analysing the cultural institutions of science are clearly demonstrated in Crane (2014). In an investigation of a participatory agricultural research project, he writes that the 'institutions and practices of biophysical sciences, as cultural spaces, have often been either left invisible or assumed to be purely technical' (p. 46). He envisions that

empirical social research on scientists' technical practices, social organization, and institutional norms – alongside the same research done with farmers – will enable a better theorization of how and why certain forms of applied agricultural research work (or do not work), which should in turn enable applied research strategies to become more effective. (p. 47)

Further, an analysis of farmers' and scientists' institutions within the same framework rejects the perception of technologies as merely 'technical' or 'biophysical' and thus devoid of history and culture. Technologies relate to a rich repertoire of gendered historical experiences and social institutions in the scientific context and – when offered to farmers – in the local context. What Padmanabhan (2007) describes as the rooting of innovations in a gendered life-world can also be understood as processes of translation. Garb and Friedlander (2014) use the metaphor of 'technology translation' to examine how the technologies agricultural scientists deliver are re-invented or re-linked to social relationships in a new setting. In a dialogical manner, key actors (such as extension officers or SAI project staff) and farmers translate technologies into local contexts – a process in which implicit and explicit project approaches play an important role and allow for multiple intended or unintended consequences. Translation may reinforce or transform existing inequalities in land-related institutions. This approach is useful for conceptualizing the interaction between SAI and land-related

institutions and their outcomes in respect of control over land, labour and benefits. It should be noted that our analysis does not have a narrow focus on the adoption of technologies, but explores gender implications of SAI in a broad manner. In what follows, we outline how the conceptual framework informed sampling, data sources and methods.

2.2. Sampling, sample description, methods and data analysis

For this paper we analysed data from Ghana and Malawi. Both countries have experienced intense agricultural development investments, have a plurality of laws governing land matters and are currently undergoing reform of land tenure policies (Berge et al., 2014; Lambrecht & Asare, 2016). In Malawi, the Customary Land Act of 2016 provides for individual or group land registration (including joint registration for couples). It works contrary to previous practice, where inheritors were determined in agreement with local matrilineal or patrilineal patterns. Land committees are supposed to deal with registration applications and consider equality of outcomes in the process (Government of Malawi, 2016). In Ghana, the government had not yet passed the new land bill in 2019. Civil society organizations such as Network for Women's Rights Ghana were lobbying to keep the bill's gender provisions (when passed into law) to reduce discrimination in relation to land.

A qualitative methodology was chosen to capture emic perspectives and explore the contents of and relationships between various components of the conceptual framework. Two sources were used: first, qualitative data on gender preferences regarding SAI technologies collected in 2015 and 2016, and second, case studies on gender-biased land tenure systems in SAI contexts carried out in 2017 and 2018. Both data sets relate to the same districts in Ghana and Malawi (except for Mzimba in Malawi which was not part of the first data set). The respondents were participants in two SAI projects, or knowledgeable about them. The projects as such were not systematically evaluated. For this reason and for confidentiality reasons we refer to them merely as 'SAI projects'. The technologies offered in the projects cover all four types of land use intensification identified by Martin et al. (2018), namely farming system conversion, increased inputs, crop or product change, and mixed intensification, with the last type being most

prominent. Selected technologies were combined and assessed (in part using Musumba et al., 2017) in terms of their potential to deliver SAI outcomes.

From the data pool outlined above we purposively chose two communities for each country, which differ in their gendered land allocation (Table 1). This enabled us to make both in-country and cross-country comparisons. In Malawi, we selected a patrilineal community in Mzimba district (Northern Region) and a largely matrilineal community (with some exceptions) in Dedza district (Central Region). While in the patrilineal system men inherit land and women gain access to land through marriage, in the matrilineal system land is passed down from mothers to daughters. In the latter system, men settle in their wife's community and cultivate her land (Berge et al., 2014). In the Dedza sample there were also cases of virilocal settlement and patrilineal inheritance. Mzimba district is less densely populated than Dedza and has a higher out-migration rate (NSO, 2019).

In Ghana, we selected one community in the Tolon-Kumbungu district (Northern Region) and one community in the Kassena-Nankana district (Upper East Region). Both communities are marked by patrilineal inheritance patterns. They are not representative of the diversity of Ghanaian land tenure systems which include matrilineal inheritance, as for instance among the Akan. In spite of this, Apusigah (2009) has established a distinction between the two selected regions, namely between women as 'farm hands' and 'non-farm hands', with important implications for access to land. Women farmers in the Northern Region tend to be perceived as being obliged to play reproductive roles rather than productive roles, and as 'merely helping' their husbands in the fields (non-farm hands with limited land access), whereas women in the Upper East are considered as farmers in their own right with both productive and reproductive responsibilities (farm hands with a relatively higher level of land access). As a result, Ghanaian women farm on their own individual

plots to varying degrees (beyond their obligation to work on the household plot controlled by their husband). By contrast, women in Malawi mainly engage in joint cultivation with their husbands.

Within this sampling frame, we purposively selected a total of 248 interview partners from Kabeeer's (1994) four key institutional domains. At the household level, we interviewed women heads and widowers (single adult households), men and women in monogamous and polygamous unions, and young married and unmarried men and women (below 35 years). The community sample in Ghana comprised *magazia* (queen mothers), members of agricultural research-for-development platforms, community facilitators of the SAI project, chiefs, Christian pastors, *tingatu/tindana* (earth priests) and one imam, while the Malawi sample consisted of village heads/chiefs at various hierarchical levels. In the market domain, we approached land brokers in Ghana, and in Malawi farmers who had repeatedly been involved in commercial land transactions. In the government domain, we selected extension officers, government planning officers and land officers (Table 2).

Semi-structured interviews were the prime method for this study. Talking to individuals in a setting of privacy was conducive to getting them to talk about their experiences with land allocation and SAI technologies, and especially their ideas concerning a redistribution of land that probably would not have been shared in a group (particularly where these ideas go against dominant norms). Apart from this, we conducted 11 focus group discussions, 8 with women and men farmers in both countries, one with women chiefs from Dedza, and two with men chiefs from both Malawi districts. All interviews and focus group discussions were conducted in local languages (Chichewa and Tumbuka in Malawi, Dagbani and Kassim in Ghana), recorded, transcribed (verbatim), translated into English, and coded and analysed using the qualitative data analysis software Atlas.ti.

3. Results

The presentation of results follows the three steps outlined in the conceptual framework. First, we focus on an institutional analysis for Ghana (Step 1) and then expand to include gender implications of SAI in the same context (Step 2). The presentation is structured by Kabeeer's four institutional locations to provide insights at multiple scales. Subsequently, we repeat

Table 1. Sampling frame.

	Relatively limited access to land for women	Relatively higher level of access to land for women
Ghana	Tolon, Northern Region: patrilineal inheritance, women as non-farm hands	Kassena, Upper East Region: patrilineal inheritance, women as farm hands
Malawi	Mzimba, Northern Region: patrilineal inheritance	Dedza, Central Region: matrilineal inheritance

Table 2. Sample description.

	Ghana		Malawi		Total	Men	Women
	Kassena	Tolon	Dedza	Mzimba			
Household	38	31	72	18	159	66	93
Community	11	9	25	24	69	58	11
Market	2	1	3	4	10	7	3
Government	3	3	2	2	10	7	3
Total	54	44	102	48	248	138	110

the same steps for Malawi. Finally, we compare the results for both countries and outline what respondents perceived as entry points for change (Step 3). For Step 1 the following should be noted: we acknowledge that access, control and ownership can be defined as related to context-specific bundles of rights in each of the selected research sites. However, an elaboration of these would go beyond the scope of this paper. We therefore use the terms broadly, defining access as the right of use of land, control as the right to decide on land (including benefits from land), and ownership as additionally covering the right to transfer land, for instance through purchase or rent (Doss & Meinzen-Dick, 2018). In Step 2 a limitation applies: we examine interactions between SAI and land-related institutions in each domain, except for the government domain where respondents provided very little information on interactions. This gap needs to be filled by further research.

3.1. Ghana

3.1.1. Institutional analysis

3.1.1.1. Household institutions. 'I am only aware of the system where the male children inherit from their father, while the female of that man are denied', a man farmer said. In spite of changes, the patrilineal inheritance system is intact, as confirmed by respondents in Kassena and Tolon. Daughters are perceived as 'migrants' who will be given access to land in their husband's household and may return after being widowed. Unmarried women may have access to land in their household of origin, but the older they grow without departing, the more 'they lose dignity and respect per our traditions', the same man said. There is a discursive juxtaposition of permanent male household members who have ownership and complete control over land, and 'migrant' female members who have no control and are not included in land-related negotiations.

One woman said that if land is abundantly available, there is no discrimination in respect of requests for plots (separate from the household plot managed by the head). But if land is scarce, men receive bigger areas and women end up with smaller plots or none at all. The reasons for allocating smaller plots to women go beyond their perceived migrant status. Men are considered as having more physical strength and better farming skills. Women have to work on the household plot first before attending to their own fields; and men are expected to provide for the women. For these reasons women do not need a lot of land, as several respondents explained. Limiting women's land access relates to men's efforts to ensure sufficient female labour for the household plot. Often, women's land is not only smaller but also less fertile and further away from the house. In terms of ownership, widows constitute an exception: they become temporary owners and decision-makers in respect of the family's land until their male children have grown up. In such situations, the deceased husband's brothers may, and at times do, appropriate the land.

One of the recent changes described by interviewees from both Ghanaian districts is a tendency for intergenerational land transfers to happen earlier than they used to. A 62-year old widower entrusted his land and questions of benefit sharing to his two sons, without interfering in their decisions. 'I left that in their hands because these days if you don't allow them to do that and they get fed up, they will abandon me and begin farming on their own', he said. Others reported that timely hand-overs help to reduce conflicts and suffering, should the older male owner die. Married women in Tolon are beginning to farm on separate plots, while in the past they were more confined to the cultivation of 'women's crops' (such as vegetables) on field margins, in home gardens or as an intercrop in their husband's fields.

3.1.1.2. Community institutions. Respondents described the clearing of community forest areas or

'virgin land' to set up farms as a strategy to acquire land for cultivation. It secures unchallenged ownership for men in patrilineal settings. Today, however, 'virgin land' is hardly available any longer. This has led to a greater focus on other land access strategies. A second strategy in the community domain, translated as 'land begging' in Ghana (and 'requests for land' in Malawi), is the reallocation of fallow land to community members in need of cultivation plots. In Kassena, it was described as a transfer between households in which tokens of respect (kola nuts, local gin, yam, salt, more recently cash) are exchanged for land, under the witnessing eyes of elders or community leaders. In Tolon, a stronger involvement of chiefs (the authority for all land) and their elders is necessary. Land begging is partly conceived as borrowing and partly as permanent transfer of ownership, the latter only for men. Borrowers will at times share some of their harvest with the landowner, but excessive demands are deemed abusive and offensive to the ancestors.

In Kassena (but less so in Tolon), women were said to easily gain temporary access. 'As long as there is enough land lying fallow, the woman will be granted access. We do not discriminate between men and women. The situation is changing now as compared to previously', stated a woman. In both districts, women may depend on their husband's or a male relative's support in land begging processes. The plots allocated to women and non-native men (from other communities) were described as smaller than those of native men (often termed 'original owners'). In the begging process, the ability of the requester to intensively produce is taken into account and may determine the area made available. Thus, a beggar has to 'deserve' access by appearing diligent and/or being in a position to mobilize other people's labour. Gender norms favour men since they are regarded as physically stronger and as having better access to unpaid household labour as well as paid labour.

In terms of decision-making, the interviewees in Ghana unanimously declared that women are not invited to community meetings concerning land, although they do take part in other meetings. Not even the *magazia* (queen mothers) have a voice. The exclusion of women from decision-making was explained by the belief that land matters are spiritual and the involvement of women (as 'migrants') creates dangers. Young men, however, are invited more and more frequently to meetings on land, to listen, learn and give their suggestions, as local leaders explained.

Young men's engagement is emphasized where they could disagree with a decision and subsequently withdraw their labour, for instance for community development activities.

In connection with other recent changes, a monetization of land begging was described. As a result, transfers of fallow land are increasingly understood as renting or purchasing, and less as borrowing, thus shifting access opportunities to the advantage of better-off women, young people and 'foreigners' (beggars from other communities). One man said that young people's money is often appreciated more than old people's social capital. Kola nuts are not always replaced by money. Fertilizer and ox plowing services were mentioned as new gifts in begging processes. These gifts are demanded not once, but for every new season. They allow landowners to intensify production on their remaining land. At the same time, respondents perceived land begging as becoming more short-term and difficult. As land is scarce, 'landowners will rather preserve the land for their children than grant access to people not from their households', explained a young woman.

3.1.1.3. Market institutions. While respondents reported both continuities and changes in community and household institutions, many considered the emergence of market institutions in relation to agricultural land as a novelty. In Ghana, a common remark was that land sales are not yet considered ordinary practice, but are happening more and more. Farmland – especially when close to business or transport hubs or educational centres – is turned into building land for commercial or residential purposes. An estate agent said that renting out agricultural land for short periods is developing into a profitable business, since prices may be raised after each agreement period. Some farmers find their borrowing arrangements canceled and the land they have cultivated put up for sale or rent.

In Kassena, the main market actors are men household heads (as land owners), an increasing number of middlemen, and buyers of diverse age, gender and origin but often engaged in business or in government or development organizations. In Tolon, the sub-chiefs are more involved in land matters than in Kassena, and are identified as important beneficiaries of land sales. Where farmers do not have land titles, sub-chiefs may sell their plots and force them 'to go to far off places' to farm, as a Tolon middleman explained. The role of chiefs in the market is contested

in both Ghana districts. While the chiefs in the sample presented themselves as rejecting the association of land and profit and as clinging to their obligation to preserve land for future generations, government officers, farmers and other community leaders painted a different picture, especially of Tolon chiefs. The chief in Kassena opposed land sales for additional reasons: sales bring ‘foreigners’ into his community who might ‘indoctrinate people’. Not only migrants, but also women and young people find new opportunities in the market. ‘Land transactions are based on who has money. There is no discrimination, even though some don’t feel comfortable selling their lands to women, but you need the money and she has ready cash’, declared an estate agent and spoke of cases where elderly women buy land for their children and in so doing undermine patrilineal land transfer patterns. However, young men and women were described as often lacking the capital to access agricultural land through the market.

3.1.1.4. Government institutions. National laws are not applied in land matters, or only in specific areas where the government controls land. The Ghana respondents agreed that men household heads, community leaders and their institutions override statutory law. Educated people turn to the police or a court for national laws to be applied in cases of conflict, but local traditional authorities deal with most complaints. The land planning officer said that in Tolon, chiefs were aware of national land laws, but ‘their parochial interest matters more to them than national interest’. Indicative of this is the unwillingness of some sub-chiefs to support land registration and the collection of government ground rent; sub-chiefs are used to demanding payments themselves from landholders. Most interviewees in the Ghana sample reported knowing little or nothing about the new national land bill, yet it was common understanding that equality is a principle of the law. An extension officer explained that not the law, but customs and traditions limit women’s access to land. He emphasized education and extension training as enabling women and men to negotiate land matters better. Past government efforts to increase land security of vulnerable groups (such as in the Land Administration Project) were not mentioned by respondents, probably because they have not reached the community level, or only in part. Land transactions continue to be undertaken with very little intervention on the part of the state (cf. Britwum et al., 2014 Ubink, 2008).

3.1.2. Gender implications of SAI

3.1.2.1. SAI interactions at the household level. In both Ghana districts women farmers saw themselves (and were described by others) as eager to learn SAI practices for various reasons. In Tolon there was a (self-)perception of women as ‘new farmers’ who are open to different methods and who give their smaller fields the attention needed for intensification, as opposed to men, who were seen as more inclined to cling to their established ways of farming. In a FGD in Kassena, women identified their own strong concern with household food security as a motivation to engage with the SAI project, a point several key informants confirmed. In spite of women’s interest in SAI, their role in decision-making is limited. After the meetings they carry the information back to their husbands, but ‘the men may find it very difficult to accept the information the women bring home’, said a member of the project-associated research-for-development platform.

When the men are not interested in the technologies, they often stop the women from adopting it. This is because it is the men who give them the land. Women take decisions only if they farm on their family land, which is not common,

said an extension agent. As a result, women farmers frequently do not go beyond small-scale experimentation with SAI practices, as two other extension staff explained: ‘This is because of their small land sizes. The farmers need one acre of land to upscale and most women do not have access to an acre of land, so they just do the baby trials’. To summarize, inequitable land ownership and as a consequence inequitable access to and decision-making on land constitute profound obstacles to a broader engagement of farmers with SAI – an issue that some Ghanaian women try to tackle in their households by attracting their husbands into the SAI farmers’ groups.

Inequitable land ownership does not only constrain the general delivery of SAI. It may also influence how specific SAI practices interact with the allocation of land, labour, crops and income at the household level. For instance, in Tolon the SAI project promoted maize-vegetable intercropping to maximize land productivity in the rainy season. Maize was intercropped with various vegetables including okra and rosella. This kind of intercropping was not new in the district, although never applied in such a planned and systematic manner as required by the SAI project. Maize-vegetable intercropping constitutes a local practice based on women’s restricted access to land

and a gendered crop allocation (vegetables as 'women's crops', staples as 'men's crops'). Women plant vegetables (such as rosella and okra) in their husbands' household fields for lack of other space, as outlined above. The question of how Tolon farmers perceived land use intensification through the technology would merit further investigation. Was it perceived as new? How did it resonate with restrictions on women's land access, especially since inequitable land and crop allocation were not worked upon at the same time?

Turning to labour, in a FGD in Tolon some men reported that the practices they had chosen in the SAI project came with higher labour requirements and were therefore implemented only on part of their available land. At the same time the gendered division of agricultural labour was kept up on household fields. Taking the example of strip cropping maize and cowpeas (in combination with good agricultural practices), one man explained: 'We carry the women along. We create the holes for them to sow. Their problem is the number of holes. If you are not many (working in the field), it will disturb you'. Dribbling (a 'man's task') and sowing (a 'woman's task') become more time-intensive. Narrower spacing (as compared to farmers' practice) and the choice of a legume as intercrop may affect subsequent steps in the production process in terms of the labour involved. The second weeding (a 'man's task') may become less through weed suppression, while harvesting (a 'woman's task') may become more through higher productivity. The SAI project's community facilitator in Tolon explained that he calls men and women separately to train them in new practices, each group in their specific gender roles. In doing so he translates the practices and their labour requirements into a pre-existing gender order. Inequitable labour implications can be avoided, where work arrangements become more flexible and support is granted; yet control of labour often remains in men's hands and is justified by land ownership. Some men described their role as 'landlord' not only as deciding for a technology, but also as ensuring that women and youth contribute labour to the technology's success. As a result, men heads may restrict the access of women and young people to plots of their own in order to secure labour for the joint household plots first. This again may limit control over the benefits of one's own labour, which women and young people often only have on

separate plots. At this point, control of land, labour and benefits blends into one.

Asked about who benefits from the new crops introduced, a male community facilitator from Kassená remarked:

It is still the men. Even though there are women in the SAI farmers' group who also cultivate and rear, it is the man who still owns her and all that she has. The man still controls the woman, because she grows the crops on the man's land.

Especially millet as an 'old' staple used to be strictly controlled by men. It was stored in barns women would not have access to. Where farmers replaced millet with improved maize varieties (promoted by the SAI project), they harvested larger quantities, said a key informant, and added:

Now the maize is in the room. If the man is away, the woman can fetch some and use. Initially the men had to control the food because the millet was not enough. But with the maize, you can harvest about 10 bags and that will not fit into the barn.

This quotation shows how higher productivity combined with a flexible crop allocation (maize as neither a 'man's' nor a 'women's crop') can reduce men's control of the harvest, a situation from which women and children may benefit. A question for future research would be whether increased productivity from smaller areas of land could equally relax men's control of land, and if so, how this could result in more equitable access to land. In the meantime, as one extension agent claimed, the small farm sizes women individually cultivate still determine their crop choices. Most women would grow groundnuts or vegetables. Only older women taking land from their natal families or women heads would opt for staples. However, as women participants in the SAI project emphasized, they have ventured into producing maize on their own and may at times keep the benefits.

3.1.2.2. SAI interactions at the community level.

Several interviewees in our sample reported that women in Tolon increasingly seek their own plots in the community, while in the past they were largely confined to helping out on the household plots. The activities of the SAI project seem to have promoted women's land begging, as men indicated in a FGD: a women may receive seeds for experimentation, but then lack land to establish a farm.

If she does not get it from the husband, her problem will be to go outside and look for land. But all the women, they want to make such farms. If they do get land, the others will have finished working on their farms,

said a farmer. In a situation of land scarcity and time pressure, some men support their wives in land begging, so that they can participate in SAI groups. Others – prompted by community discussions – rethink land allocation at the household level and more easily assign land to their wives, as a queen mother claimed. In Kassena, a member of the project-related research-for-development platform said: ‘We have spoken to the men and they understand that when the women need farmland to farm, they should allow them and not give them any problems so that they can also farm to support their families’. Another agricultural development project was also mentioned as a site where women could jointly access land through community negotiations. These initiatives can be seen as partly mitigating the land-related obstacles to involvement in projects faced by women at the household level. In addition, respondents (especially from Kassena) emphasized the unity and mutual support women have established in their farming groups. This includes labour support as well as knowledge sharing in respect of the new technologies. Here, collective action relieves the labour and knowledge constraints women may face on their individually managed fields.

The way intensification interacts with exchange networks at the community level emerged as another important investigation area. Respondents spoke of landowners who decide to intensify agricultural production, but cannot pay (or do not want to pay) the costs for additional labour or inputs. In line with the increasing monetization of land begging, they allow access to part of their land and demand inputs or labour in return. ‘You have to give the landowner a bag of fertilizer, and if you intend to use it in the coming years, you have to continuously give money or fertilizer per acre’, reported a man in Tolon. Another farmer said that borrowing three acres of land had to be ‘paid’ for by plowing another three acres for the landowner. These exchanges raise important questions that we will outline below in conjunction with the Malawi results.

3.1.2.3. SAI interactions at the market level. Women who rent land (through monetized land begging or market transactions) were described as often having to renegotiate every year, while men tend to enjoy

more long-term security in terms of their rental agreements. This is in line with the generally lower tenure security of women, even for land allocated by their husbands or borrowed at the community level. However, the way tenure security relates to gendered preferences in respect of SAI practices would need further exploration for Ghana and was only discussed by Malawi respondents (see below). Women respondents in Ghana indicated a preference for intercropping a variety of short-maturing crops to make the most of their plots and to reduce the risk of crop failure. One can assume that this not only relates to their household provisioning role (which sees women as responsible for diverse soup ingredients, while men provide the staples), but also to the awareness that access to land can easily be revoked. There are no data on how the security of purchased land interacts with the choice of agricultural practices.

3.2. Malawi

3.2.1. Institutional analysis

3.2.1.1. Household institutions. In Malawi, differences between districts and their household institutions were more pronounced than in Ghana. In matrilineal Dedza, land is inherited through the women. Most men settle and farm in their wife’s community. Even though they may lose access to their wife’s land upon separation or divorce, men’s position as head may equip them with decision-making power in household negotiations. On the clan level, the wife’s brother often exerts the strongest authority in terms of land allocation. If parents have enough farmland, their unmarried children may be given smaller plots to grow their own crops. However, these young men and women still have to help in their parents’ fields. Some respondents described a social norm which says that if members of one household permanently farm separate plots, this can be read as a lack of family unity. In the light of ever-smaller farming plots and fragile marriages, polygamy has emerged as a strategy for men to secure multiple access to land and labour. As a recent development, young men (and to a lesser extent women) are depicted as struggling to rent land on top of the small areas accessed or inherited in their households. Another recent change is the introduction of by-laws by the woman Dedza chief, Kachindamoto (who is famous in Malawi), that protect women in the minority patrilineal communities in Dedza from being chased off their farms after their husband’s death. How the by-

laws relate to widowers in the matrilineal setting was not explained.

In patrilineal Mzimba, men are regarded as 'real land owners', while women are 'visitors' in their husband's village. A problem respondents discussed in depth is the case of women who return to their parental home after divorce or separation or after being widowed. If you give your daughter land, said one father, she will live in constant conflicts with her brothers who consider her plots as theirs. Reallocation starts with her re-marriage at the latest. Several chiefs identified the root cause not as unequal land distribution, but as increasingly unstable marriages. Apart from unstable marriages, ever-smaller land inheritances pose a problem (yet less pronounced than in Dedza) and were noted as a recent change. In some households, unmarried youth are given access to land regardless of sex. However, often it is young men who receive land on the way to becoming independent.

3.2.1.2. Community institutions. As in Ghana, the clearing of land as an access strategy is not common any longer in Malawi, since 'all land, be it a bush, has an owner', as an elderly man in Mzimba said. However, chiefs (including women chiefs in Dedza) assign their own idle land (if they have sufficient land) to borrowers, or act as agents between requesters and landholders. Many respondents said that transfers are accomplished without money or negotiations and merely require a token of appreciation for the chief. However, chiefs do not take young unmarried farmers' pleas seriously and argue that young people should be helping in their parents' fields. At this point, community leaders and family elders join hands to ensure that young people contribute to household labour. In matrilineal/matrilocal Dedza, requesters were described as people coming from large families, or as men who had married into the community and were seeking access to additional plots (other than the ones owned by their wives). Because of their 'visitor' status, these men would be given temporary access only.

In Mzimba, married women sometimes request land, but requests from widows (who are seen as fending for themselves) are deemed more acceptable. Women first have to become 'citizens' in their husband's communities before they can approach the chief, said one woman. In terms of recent changes, respondents saw the emergence of a hybrid between free and monetized land transfers, which

increasingly takes the form of sale or renting. Not only landowners but also chiefs demand higher amounts of money than they used to. At the same time, families or clans guard land for their own members and do not easily grant requests for borrowing any longer. Land scarcity is seen as promoting land conflicts and segregated access. In matrilineal Dedza this appears to push men onto the land market more than is the case in patrilineal (and still more land abundant) Mzimba. In both districts, respondents showed how requested land is later incorporated into prevailing inheritance and ownership patterns.

3.2.1.3. Market institutions. In Malawi the role of chiefs in the land market is as disputed as in Ghana. In Dedza the market appears more vibrant than in Mzimba, where the paramount chief adopts a hostile stance towards commercial land transactions. In the group discussion in Dedza, men chiefs at first denied their involvement in sales, but later admitted to at least receiving a commission locally known as *chichot-saminga*. Other respondents described cases where chiefs sell land under their authority and function as (estate) agents for those who want to buy or sell. Middlemen have not yet gained a strong foothold in Dedza. Rather, buyers approach the chief or the government land officer.

In both districts an increase in agricultural land sales and renting was reported. Buyers and renters are motivated by the insufficient size of inherited plots, the decrease in land available for borrowing, and the limited access to and control of land for men in the matrilineal setting. Those seeking land include actors from outside the districts, namely government and private sector employees (both men and women, some of them young, some working abroad) who want to engage in business farming. Sellers are driven by the fear of land 'snatching' (government development plans), by emergencies and poverty, and by conflicts within and between families or clans. In Mzimba, men are mentioned as renting out land for agricultural production and as controlling the income from it, but women farmers are said to be inconceivable as sellers, renters or buyers (although exceptional cases are described). A woman said: 'If I buy land, my husband will think I am preparing to divorce him'. Thus, women's market participation is shaped not only by the availability of capital, but also by norms in respect of what is considered 'appropriate' behaviour for women.

3.2.1.4. Government institutions. In Malawi, the new land law was perceived as being just as remote from actual implementation as in Ghana, yet discussions on it (especially among village heads) were more heated. Several village heads stated that details of the new law had not been properly communicated to them. A woman community leader in Dedza explained that there are rumours that in future people will have to pay taxes for their own fields and will have to go through costly registration processes; she said that without proper sensitization, villagers would approach the chiefs with many questions and would suspect the chiefs of stealing from them. Men chiefs in both districts held that the leasing of agricultural plots would be read as a government fundraising effort among poor citizens. Linked to this criticism is the fact that leaders fear losing their land-allocation authority in the communities.

Respondents from the community and government domains recognized that the new law would increase tenure security. However, questions were raised about how replacing collective by individual ownership would relate to gender. Chiefs and government officers discussed possible two scenarios: in the first, individual male children lease land and individual female children continue to have challenges. In the second, individual female children lease land, get married and leave the community. At this point, some Mzimba chiefs saw leasing as ‘disturbing a lot of things’, since male family members would have problems appropriating the land owned by female relatives.

Others praised what they regarded as precursors of the new law, especially increased land access for widowed or divorced women returning to their households of origin. ‘With the coming of national land laws, things have changed and now female children are slowly being considered as land owners as well’, observed a government officer. On the other hand, land titling was depicted as stoking up the emerging land market. Communities have their own ways of establishing land ownership, a district agricultural development officer said, and he added that the title deed has become a symbol for land sales; it is not clear to villagers why else one should need a title deed. A woman land officer said that at the same time, organizations such as LandNet and its partners are driving campaigns for ‘people to first own land if the objective of increasing agricultural yields is to be achieved’. Such campaigns, meant to support

intensification, are not received well by some of the chiefs.

3.2.2. Gender implications of SAI

3.2.2.1. SAI interactions at the household level.

Similar to the Ghana districts, women in Dedza are mentioned as having a high interest in learning and applying practices meant to deliver SAI outcomes – more than men.

Most of the technologies are adopted by women since they are the ones that usually attend our field days or demonstrations. Men would usually wait to see what works before they make a decision to patronize specific demonstrations or field days of their preferred technologies,

explained a woman extension officer. As in Ghana, respondents link Dedza women’s interest in intensification to their concern with household food security. Yet, remarkably different to Tolon and Kassena, Dedza women own land. However, when it comes to married couples, women’s authority is counterbalanced by men’s household headship, a strong ideology of joint family farming, and some women’s fear of losing the respectability marriage confers on them if conflicts should lead to separation. The decision to adopt crops (such as those promoted by the SAI project) is therefore more subject to negotiations. Respondents described how power relations vary from household to household with differing outcomes. The question of access to land for SAI experimentation was not raised for married men, but constitutes an obstacle for unmarried youth. A young participant in the SAI project is experimenting with new practices on his wife’s fields. His unmarried peers, however, ‘find it hard to join the group because they are supposed to have their own land’, he stated.

How control of land interacts with an intensification technology is illustrated by the following example from Dedza. Farmers who cultivate cowpeas in this district have a ready market. When the SAI project introduced a high-yielding, drought-tolerant cowpea variety grown as a mono-crop, it caught the interest of both women and men participants. Yet, some women felt that their husbands were using their headship to reap disproportionate benefits, and reacted. ‘We grow maize together, but for the cash crops; we grow separately so that everyone should sell on their own. The same field, we divide it in the middle and everyone knows what is

his and hers', said a woman in a FGD. In the same discussion, respondents explained that splitting the land was also meant as a measure to counter some men's insufficient labour investments and the transfer of benefits from one household to another in polygamous unions. The authority to divide farmland lies with the women and relates to their control of labour and benefits. Division does not affect women's land ownership.

Asked whether similar divisions of land occur in Mzimba, most farmers and key informants denied the existence of such cases or indicated that they were rare. One agricultural extension officer reported that women at times cultivate particular crops such as groundnuts on their husband's land, but only on small areas in order not to offend the man. Even if a man makes a 'mistake' and allows a woman to grow her own crops, 'the man still maintains ownership of the crops', claimed another respondent. Men's control of land and benefits in Mzimba may contribute to what key informants described as a self-selection process among women for engagement in the SAI project. Joint participation of husbands and wives is rare, we were told. Those women who take part can apply the intensification practices, since they belong to specific groups. Some are elderly and have been married for a long time, so that they have gained authority in their households (which may include a separate piece of land). Some are widows who have temporarily inherited their husbands' land, since they have male children who are heirs. Some live in polygamous unions, where wives have separate plots and take separate decisions, independently from their husbands. And finally, in some cases their husbands have migrated, leaving them with decision-making power for agricultural activities. Even in the last case, women tend to be older, since younger women with migrant husbands are often left under the authority of their father-in-law. It would be important to further investigate how far these specific groups of women with (temporary) control of land also have sufficient access to and control over labour, and how this influences their choice of and actual implementation of intensification practices.

3.2.2.2. SAI interactions at the community level. As in Ghana, interviewees in Malawi described exchange networks at the community level that revolve around inputs and land. Especially the demand for industrial fertilizer was perceived as a prime motivation to lend some of one's own land

to others. In Mzimba, a widow said she could not cultivate all of her four acres, but that she had not found anyone who would barter input for land. Experimentation with intensification practices such as conservation agriculture was mentioned as additionally raising the demand for inorganic fertilizer. Where transactions were mentioned, it remained unclear whether land requesters bought the fertilizer or sourced it from Malawi's government subsidy programme. Exchange networks around land access provide fertile ground to explore how inequalities relate to SAI in both Malawi and Ghana (and even beyond). The following questions could be raised, among others: What are the social characteristics of those involved in the exchanges (gender, age, livelihood strategies etc.)? Who exchanges which area of land for what kind of input or service in order to implement an intensification practice? To which practices do landowners channel the 'payments'? What kind of land is granted to a borrower or retained, in terms of soil fertility, location, etc.? What are the results for the individuals living in the households involved in the exchanges? How far do these intensification transactions curtail or enable access to land and participation in SAI for women and young people? How does the tenure insecurity of borrowed land influence the way farmers select practices?

3.2.2.3. SAI interactions at the market level. In the matrilineal setting of Dedza, several respondents agreed that men would realize more benefits from land acquired in the market.

The man does not put much effort to improve the land that belongs to the woman's side because he fears wasting resources in improving the land that he has no control over. They anticipate divorce or separation. With this thinking, men invest in land that was sourced through buying,

explained a key informant. In a FGD a man farmer added that 'rented or purchased land gives more benefits because the farmer puts more effort to compensate for the costs of buying or renting'. When asked what land they would select for a farm trial (within the SAI project), most men in a FGD in Dedza chose purchased or rented land over land owned by their wife. They also indicated that they would more likely make efforts to improve soil fertility (for instance through conservation agriculture) on a purchased field. However, it was also reported that some men

Table 3. Comparison of tendencies in Ghana and Malawi research sites.

	Kassena	Tolon	Mzimba	Dedza
Household	Women's farming on separate plots as established practice	Women's new move into farming on separate plots comes with perceived openness to SAI practices	Joint plot cultivation as a social norm	
Household	Young women perceived as 'migrants' with limited access to land (access through marriage) Elderly married women, widows and women in polygamous unions more likely to have access to land Women's low involvement in decision-making and their limited access to land restrict engagement with SAI and autonomous adoption decisions Patrilineal land inheritance justifies men's control of land, labour, crops and benefits; high tenure security for men		Young men perceived as 'migrants' with limited access to land (access through marriage) Women's involvement in decision-making and matrilineal land inheritance facilitate stronger engagement with SAI Women's authority counterbalanced by men's household headship leading to diverse adoption decisions and diverse patterns of control; high tenure security for women	
Household	Tendency for intergenerational land transfers to happen earlier for young men			
Household Community	New emphasis on involving young men in decision-making Projects may facilitate an increase in women's access to land			
Community	Land borrowing as a process between households	Stronger involvement of chiefs in land borrowing		
Community	Monetization of land begging provides new opportunities to young men			
Community	Agricultural intensification facilitated through farmers' exchange networks			
Market	Household heads rent out or sell land	Strong engagement of chiefs in selling land	Limited engagement of chiefs in selling land	Strong engagement of chiefs in selling land
Market	Low tenure security on rented land for women		Low engagement of men in the land market Norms constrain women's market engagement	Strong engagement of men (even young men) in the land market to achieve tenure security Men more inclined to make SAI investments on purchased land
Government	Limited knowledge of statutory land law and legal changes		Limited knowledge of statutory land law and legal changes; resistance of chiefs to new land law	

shy away from buying land in their wives' communities, which they often leave after marriage break-ups. In this case short-term renting is preferred over buying. To sum up, one can say that in Dedza the market provides wealthier men with opportunities to increase their land tenure security, but cultural norms in respect of 'being at home' as opposed to 'being a visitor' restrict use of this opportunity. Men farmers from patrilineal Mzimba saw no difference in terms of investments in inherited or purchased land.

The table below (Table 3) summarizes similarities and differences between the four research sites. It should be noted that only tendencies are captured from the more complex analysis above.

3.3. Avenues for change

Convergent and contradictory institutions provide avenues for change. Below we investigate where respondents see entry points for changes in land-related institutions and underlying systems of norms (Step 3; summarized in Table 4). In the subsequent discussion and conclusion, we outline how SAI project approaches could support the facilitation of equitable outcomes.

3.3.1. Ghana

In Ghana, men respondents in the community domain described changes in land distribution as dangerous

Table 4. Avenues for change as envisioned by respondents.

Ghana	Malawi
More involvement of women in decision-making on land and benefits	
Earlier intergenerational land transfers	
Equal land inheritance by customary and statutory law	Chiefs as role models by establishing gender-equal land inheritance in their own families
Legal education for community leaders and farmers	
Community sensitization to more equitable access to land	
Restrictions on chiefs' activities in the land market	By-laws guiding chiefs in mitigating land conflicts
Government price controls in the land market	

and potentially deadly. They saw a general danger and a specific danger in respect of giving more land to women. The general danger relates to the fact that 'some people have struggled very hard to acquire the lands they are occupying today. So to come and tell them we want to redistribute your land, (laughter) you might not finish your statement and they will attack you', said a man. A man pastor said he would be killed if he said that women should own land, but he also confirmed what community leaders said: there are two groups of women farmers, those who 'know their position' and would not opt for changes, and those who would welcome land ownership in order to become more independent and earn a living. A chief in Tolon said that young people without land want redistribution and will struggle against other young people who have more land in their households. Families own land; changes are not possible, unless families want them; nobody will agree to touch what our ancestors and our fathers have set up: these were recurring phrases in interviews in Kassena.

In Tolon, where chiefs have more authority over land, an interest in change was reported by people who had been denied land by the chief and then seen how he distributed it to others, as well as by community members who wanted to buy land and faced the chief's opposition to sales. As a tendency, reservations in respect of land redistribution were strongest among men community leaders. But even at other institutional sites not a few men and women expressed objections (or simply their contentment with the current status quo). One argument brought up repeatedly was that redistribution would be impossible 'because there is no land'. The availability of additional land was seen as a precondition.

In spite of the resistance outlined above, there were respondents who mentioned the following

entry points for a fairer land order. In respect of the household institutional site, government respondents demanded the revision of customary inheritance rules and their subsequent incorporation in a law that ensures equal land inheritance for all children. They were not sure whether the current land law includes this. Several women farmers said that some land-owners already allocate equal plots to daughters and sons, but that daughters had only temporary tenure. An extension officer suggested that farmers (as well as community leaders) would benefit from legal education. Lack of legal knowledge and fear of complex formal procedures were seen as providing room for unequal land allocation. One respondent held that redistribution would necessitate the involvement of women in decision-making. The fact that they are left out, and not even informed about the outcome of current decision-making processes, does not facilitate change, she said. Some interviewees were pleased that a few heads have started dividing their land and handing over plots to younger household members at an earlier stage than was usual in the past.

For the community institutional site, a land officer suggested that, 'stakeholders, NGOs and government institutions should convene a meeting and plead in the form of sensitization to the chiefs and the *tindana* to understand the need to give lands to women'. While one extension officer saw dry season irrigated vegetable farming as a solution to women's low access to land, a colleague of his called for deliberate efforts to provide women with larger plots to enable their participation in SAI activities.

For the market institutional site there were contradictory views. The emergence of a land market was considered as removing discrimination – or on the contrary as perpetuating inequalities. A land broker and several government respondents (adhering to the latter view) suggested government price controls to provide purchase opportunities even for those who are less wealthy. In Tolon, a restriction of the activity of chiefs in the land market (especially as sellers) was deemed necessary to enable poorer farmers to continue cultivation. Some of the entry points outlined above relate to the government domain, such as government price controls, the revision of inheritance laws or the sensitization and legal education of community leaders and farmers.

3.3.2. Malawi

As in Ghana, quite a few respondents in Malawi found changes in land allocation inconceivable. Some

Malawi chiefs, as well as market and government actors expressed the view that inequalities are rooted in the way parents distribute their land, and are therefore beyond their control. A woman land officer saw equality as not being an issue for people in Mzimba and women's lack of land ownership as an integral part of the local culture. 'Only outsiders like you might think there is a problem. Change deals with the mind of a person. For this, it cannot just be changed from nowhere', she told the interviewer. In the sample there were indeed women in Mzimba who were content with having access to land through their husbands only, but there were other views as well. For some household respondents it was questionable whether those with land would surrender it for redistribution.

In terms of envisioned changes for the household institutional site, chiefs and household respondents suggested changes in inheritance rules to provide for the land needs of male and female children. An idea that clearly reduces men's control of land was discussed by a group of chiefs in Mzimba. While some declared that land distribution should remain exclusively patrilineal, two chiefs countered that land should be given equally to male and female children. The former respondents received this suggestion with laughter. The following quotation from the subsequent discussion reveals a fear of losing authority and the loyalty of the villagers if chiefs go against cultural norms: 'As chiefs we can agree, but we will find that we face challenges with our people in the village, the people who are in the majority'. The two chiefs who had tabled the suggestion insisted that 'village heads should be the first to start distributing land to all their children' and saw themselves as role models for implementing new rules.

Also in favour of equal land inheritance, a woman chief in Dedza demanded that transfers should happen earlier, and preferably while the children are still young. This would reduce the inheritance conflicts within the clan that often emerge when parents die – conflicts that carry the danger of returning to a less equal order. For the same reason, a land officer already encourages couples who buy land to register it not in the husband's or wife's name, but in their children's name. However, some chiefs said that young people are not responsible enough and that they might be tempted to sell the land they had received. In addition, respondents identified inclusive household decision-making in respect of land, and benefits from land, as an important entry point for

redistribution. A farmer, who was excluded from land sales processes in his wife's clan (matrilineal set-up), recommended: 'As a family, the man and the woman need to be involved in land selling or buying. Decisions should be made by all the household members including the young people'. Several men and women farmers said that, despite the fact that their spouses were the sole owners of the land, favourable conditions for all were created through joint control of benefits.

New by-laws introduced by the woman paramount chief of Dedza, Kachindamoto, were seen as path-breaking in the community domain. A village headman explained how, upon reception of their title, chiefs now have to swear, 'to keep all people' in their community. He gave the following example:

If the chief or other villagers are involved in land wrangles by forcing a woman who has lost her husband to vacate the village, by-laws work against the chief because it means the chief has failed to honor the by-law of keeping all the people.

He concluded that the government should further promote this process by providing civic education to chiefs on how to handle land cases. A district agricultural development officer in Mzimba proposed meetings with local committees and leaders to sensitize them to equality issues in land use and ownership, and to redistribute plots of land that are not fully utilized.

In the market domain, some approved of land purchasing and renting as avenues to more independent youth farming, seeing this age group's land access as restricted by parents' and chiefs' decisions. Other young respondents felt that they were limited in the market due to their lack of capital and wished for more land to be distributed freely by village heads. Government land price controls were suggested, as well as sensitization meetings on formal legal processes to be followed during sales.

In terms of the government institutional site, the following emerged: in spite of resistance to the new land law on the part of the majority of chiefs, some community leaders also referred to it as a potential road to more equitable land allocation. Since leaseholds would provide adequate documentation, full protection, clear demarcations and conflict resolution mechanisms, families or clans would be in a position to allocate equal shares to all children or to husbands and wives in the long term, they argued. However, the process of acquiring title deeds, in particular changing collective rights to individual rights, was seen as potentially sparking serious controversies among clan

members. Finally, a district agricultural development officer appealed to the government to revise its laws for large estates, which date back to colonial times and have title deeds for a period of 99 years. A restriction of leases to shorter periods (he suggested five years) would allow for continuous evaluations of land use and the redistribution of idle land to poor farmers.

4. Discussion

The institutional analysis (Step 1) shows how systems of norms and large-scale processes influencing land-related institutions co-exist in the same environment. Contradictions between these norms and processes are most visible in respondents' discussions of avenues for change (Step 3). Some men and women cling to norms that are currently dominant, while others refer to 'weak' systems that could become more prominent and reshape land-related institutions. We have quoted respondents from the same communities who cherish the benefits of patrilineality they enjoy, or question it from an equal land rights perspective, who embrace the commodification of land as creating new opportunities or reject it as unfair consolidation in the hands of a few new owners. The presentation of land-related institutions in Kabeer's four institutional domains (Kabeer, 1994) illustrates how domains interact with each other. For instance, men's restricted control of inherited land in Dedza's matrilineal household domain promotes men's interest in buying or renting land in the market domain. The increasing monetization of land borrowing in Ghana, or land requests in Malawi, must be seen as interplay between the market and community sites. Land-related institutions have clear outcomes in terms of land control. For instance, in our patrilineal Ghana and Mzimba samples, men's control over household land is used to justify control over household labour, crops and benefits. Also, control over land results in decision-making power concerning whether or not to adopt certain SAI practices. More specifically, land-related institutions influence the level of tenure security and therefore the choice and adoption of specific SAI practices.

Exploring the gender implications of SAI (Step 2), cultural institutions of science have been touched upon, but need further attention. As discussed in the introduction and in the outline of the conceptual framework, SAI land-use conceptualizations say very little about gendered preconditions, processes and outcomes of intensification. This lack of attention paid to the issue, and the lack of interdisciplinary

integration with social scientists, can in itself be regarded as an institutional gender bias that contributes to shaping intensification technologies selected for SAI delivery, processes of translation, and outcomes in the arenas of interaction. We see this as a key investigation area for future research, not only to gain a more holistic understanding of SAI interactions, but more importantly to promote equitable outcomes from SAI. This is in line with gender-transformative approaches which foster critical self-reflection by all development partners (Kantor, 2013; Wong et al., 2019).

Shifting the focus to translation, our analysis shows how it may reinforce or transform existing inequalities in land-related institutions, and change the outcomes of land-related institutions (control over land, labour, etc.). For example, one Ghana community facilitator in the SAI project linked maize-cowpea strip cropping to the local gendered division of labour. It meant increased labour for certain groups, which again might have influenced access to individually managed plots, since household fields have to be cultivated first. In Dedza, a high-yielding cowpea variety has led to an emerging pattern of land division through which women give their husbands access to individual plots, while ensuring maximum benefits from their own labour and land. It is in these processes of translation that inequalities in land-related institutions are reinforced, mitigated or transformed. In order to avoid perpetuation of (or returning to) inequitable land orders, scientists and other key actors need to think through their technologies from the perspective of potentially arising translations. This requires an understanding of the history and norms that specific practices carry or may acquire in certain contexts, and a readiness to find mitigating measures (where necessary). Included should be the question of what technologies do to land. If, for instance, soil and water conservation practices transform degraded land into more fertile land, institutions may justify appropriation of the upgraded resource by social actors with more control (Birhanu et al., 2020). In our Ghana sample, degraded land and more fertile land emerged as gendered categories.

Where projects deliberately adopt gender-transformative approaches, processes of translation can be assumed to lead to more equitable outcomes than implicit approaches that allow for multiple, potentially gender-blind and contradictory translations. However, translation does not only matter for equitable results from SAI technologies in the narrow sense. Translation influences interventions in a broad manner, namely in

terms of equitable participation in on-farm trials. Musumba et al.'s (2017) Sustainable Intensification Assessment Framework refers to this as capacity to experiment at the household level and captures it with an indicator. Where project negotiations at the community level eased land control at the household level in Ghana, an initial step towards more equitable participation was made (although further upscaling was still limited). SAI interventions need to provide more room for women and youth to engage in experimentation and upscaling, but the involvement and good will of husbands and parents are essential to avoid backlash.

Land scarcity as a large-scale process increases control over land and is often used as justification for the importance of SAI. The respondents' emic perspectives confirm growing competition for agricultural land as a scarce resource at the Malawi and Ghana sites, and complement the findings of other studies (e.g. Jayne et al., 2014; Yaro, 2010). Land begging is seen as less successful than it used to be in the past, inherited plots become ever smaller, and the pressure to seek land in the market is rising. This indeed underlines the importance of intensification practices to produce higher yields from the same area of land (and thus to reduce competition). At this point, it is important to reflect that strategies of expansion such as clearing and begging used to provide avenues for those with restricted control over land (and restricted benefits) to access plots in the community. These avenues are becoming more and more blocked, with some respondents walking further to find land, diversifying, renting plots or dropping out of agriculture permanently. Households with plenty of land are described as still having few land negotiations and few obstacles to land access related to gender. Growing competition may create new gender and intergenerational inequalities, as well as inequalities between natives and non-natives, or aggravate existing inequalities. In our case, the data reveals a number of emerging conflict resolution mechanisms, such as earlier intergenerational land transfers, development projects lobbying for women's access to land, or by-laws that protect against land grabbing within the clan. Some respondents envisioned additional changes to support fairer allocation of land.

Competition for land takes different forms if evaluated through an equity lens. In each context it manifests itself at different institutional sites with various, sometimes contradictory, outcomes. In Tolon, for example, respondents saw women's new move into land begging, and their better access to separate plots at

the household level, as being most likely short-lived due to increasing discrimination. The prominent position of chiefs and the engagement of some chiefs as land sellers were considered as contributing to land competition and commercial land transfers. At the same time, respondents described new market opportunities for wealthier women and men to acquire land. Farmers' exchange networks, through which land is bartered for inputs or services, are a specific example of how land competition interacts with SAI at the community level. SAI interventions should examine how the tenet of land productivity and non-expansion reads against land competition at various institutional sites, and find entry points for accompanying measures that support the transformation of inequitable relations.

5. Conclusion

In a recent article Pretty et al. (2018) view system redesign as essential to deliver on SAI outcomes. They argue that redesign 'is a social and institutional as well as agricultural challenge' (p. 442), yet a link to gender transformation is not established. As our study shows, SAI interventions will have to consciously adopt gender-transformative approaches to achieve more equitable development outcomes. In the ideal case, interventions should relate to changes towards more equity already envisioned by their target groups. For instance, in a situation of patriarchy and increasing pressure on land, it becomes important to facilitate negotiations for separate plots for women, as happened in Ghana. In addition, a fairer allocation of benefits from joint cultivation needs to be achieved, for instance through household methodologies (Bishop-Sambrook & Farnworth, 2014). Inclusive decision-making in respect of land and benefits was one of the changes suggested by our respondents. In Malawi, household methodologies already constitute the official extension approach and could be strengthened. Coalitions between institutional sites are necessary to effect lasting changes. As Kantor (2013, p. 5) writes: 'New gender equitable practices observed among a few households that mark them as different from the "norm" can be easily reversed if local leaders, community groups and/or informal and formal institutional practices do not support them'. This also applies to the changes envisioned by our respondents for a fairer land distribution. Forging new coalitions will involve a long-term process of negotiating with the proponents of biased

arrangements to find consensus-based and context-specific solutions, as the examples given by Stiem-Bhatia and Koudougou (2018) and Caron (2018) illustrate. In our own case, in spite of strong resistance on the part of some chiefs and local authorities to revising their rules of land allocation, our data identify the community level as an important entry point for leveraging more equality in other institutional sites. Examples are the by-laws passed by the woman Dedza chief, Kachindamoto, or the men Mzimba chiefs who volunteered as role models for balanced land inheritance patterns. Research organizations and development agencies should seek out suitable measures in several domains and join in these coalitions to make SAI inclusive through gender transformation.

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