



Food production and gender relations in multifunctional landscapes: a literature review

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Abstract High expectations are put to multifunctional land use systems that they can provide solutions to the increasing global demand for land and food. In this literature review, we ask whether multifunctional landscapes hold specific opportunities for women in enhancing food production and security in a context of gender inequality guided by a framework of access to productive resources and commercialisation. We review 104 scientific articles dealing with food production and security in a range of multifunctional land use systems across Africa, Asia and Latin America, including agroforestry, homegardens, livestock systems and urban agriculture. We find that the specific role of a landscape’s multifunctionality for women’s opportunities to enhance food security, is rarely explicitly examined in scientific literature. Our review shows that in a multifunctional setting, the products controlled by women are often secondary and far from markets, and therefore they risk being ignored in decision-making or by policy makers. Further, efforts to increase the value of traditionally “female

products” risk having adverse effects on women’s empowerment, in cases where powerful actors take over all or parts of the value chain, or appropriate the benefits. To remove these barriers traditional gender roles have to change. However, the instability of gender relations can also work in women’s favour in a multifunctional landscape where several products and production systems exist, providing opportunities to claim new roles or resources, especially in the context of changing external circumstances, such as urbanization, a shift from pastoralism to sedentary livelihoods, or an expansion of the monetary economy.

Keywords Women · Value chains · Food production · Access · Productive resources

Introduction

Multifunctional landscapes or land use systems simultaneously support habitat, productive, regulatory, social and economic aspirations (Mander et al. 2007). Examples of multifunctional landscapes include agroforestry systems, homegardens, and integrated cropping systems. Some argue that well-managed multifunctional land use systems can promote win–win solutions for climate change mitigation and adaptation capacity, while intensifying production and enhance food security in a sustainable way

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(Bustamante et al. 2014; Mbow et al. 2014). However, there are also challenges involved in the management of multifunctional landscapes. They comprise a combination of product outputs and services, both private and public. These products and services can have different time frames, and benefit a range of stakeholders with varying rights, access, and power over decision-making related to resources and management. This means that there may be trade-offs between different interests.

In this literature review we ask whether there is evidence in the literature that multifunctional landscapes can provide more opportunities for women to ensure their own and their families' food security. We review research and findings relating to the resources and activities commonly available to women in relation to the production of food, and provision of food security in multifunctional landscapes. Based on this review, we examine the nexus of gender and multifunctional landscapes guided by the following research question: how do gender roles affect women's access to productive resources and to commercialisation/marketization resources related to food security and production? We further ask where the main opportunities for women lie, as well as what the greatest obstacles are, and how they could be overcome. Finally, we discuss how policy-makers can take into account the interests of women, and pay heed to gender relations when dealing with the trade-offs involved in managing multifunctional landscapes.

Theoretical framework

The entry point to the analysis is food security including the four main dimensions of availability, access, utilization and stability (FAO 2008). In our review of the literature, and attempt to answer the questions above, we draw on a number of theoretical concepts. One of these concepts is "access", which we discuss in the context of access to resources of varying kinds. Our definition of access is taken from Ribot and Peluso (2003), who define it as "the ability to derive benefit from things". This definition looks not only on who has the right, formal or otherwise, to a resource, but also at who has the power and ability to benefit from it. Similarly, Kabeer (1999) notes that women's empowerment, meaning the process whereby those previously denied the ability to make choices acquire

such ability, requires not only that they are allocated resources, but also the agency and ability to make strategic choices around these resources.

The focus of the review lies on the role of women in the production of food, and enhancement of food security. However, we consider the constraints faced by women as produced by gender relations. Gender, as a theoretical concept, is an analytical category referring to "the social roles and identities associated with what it means to be a man or a woman in a given society and context" (Quisumbing et al. 2014: 6). Importantly, these roles are produced and given meaning in relation to each other, and must therefore be analysed as such. However, in relation to agriculture and food production, the focus has often been on men, meaning that a focus on women can help balance this, and thereby lead to greater gender equality. Our focus on women in this paper is done with an awareness of how their roles, responsibilities, opportunities and constraints are produced in relation to men, and at the intersection of multiple categories of social relations.

In exploring the role of women in food production, and the distribution of resources, it is important to keep in mind that the existence of gender roles and divisions of resources and labour does not imply that men and women work within separate and discrete production systems. Rather, to the extent that they belong to the same household/family unit, production systems are more often than not integrated, and/or connected. However, their ability to benefit and make decisions about the allocation of resources and benefits differs. Economic theory has struggled to conceptualise the distribution of resources within households using concepts such as welfare maximisation and rationality (Kabeer 1991). Such theorisation has received extensive criticism for treating households as a single entity maximising a joint welfare function (Agarwal 1997; Kabeer 1991; Sen 1990).

In order to tackle some of the problems with this type of unitary models for household decision-making, others have suggested conceptualising resource allocation within the household as a process of bargaining, where bargaining power is assumed to depend upon a person's fall-back position or outside option, such as how well off they would be if cooperation failed and they were to leave the household (Agarwal 1997; Doss 2013). However, the

restrictions imposed in economic models of household bargaining have received criticism by feminist researchers for being too simplistic and ignoring the complex web of power, social and cultural norms and preference formation that shape intra-household relations and the incentives for cooperation and conflict (Agarwal 1997; Elson 1993; Kabeer 1991).

In our analysis of the literature, we have divided the resources necessary to ensure food security into two main categories—productive resources and marketization resources. Food security issues are more closely connected with production than marketization, and, consequently, the productive resources are more extensively discussed in the literature, as well as in our review. The productive resources include land, labour, and capital, in economic theory also known as the ‘factors of production’. Human resources are not included in the analysis, partly due to their relative absence from the literature that we reviewed. The nature of access and rights to productive resource resources varies. As Meinzen-Dick et al. (2017) observe, literature on women’s land rights often refers to use, control and ownership rights to land and the different components of rights these entail, ranging from the permission to employ and assets, through the power over management and exclusion, to full ownership including the right to use as collateral and sale. From the perspective of access of Ribot and Peluso (2003), the ability to derive benefits does not necessarily require full ownership.

Labour, or time, is often a constraint for women, due to their responsibility for household chores such as cooking and taking care of children, which limits the time they can spend on other tasks. At the same time, this so called reproductive labour is necessary also to sustain the formal economy, and many feminist economists have argued that it should be recognised as such (e.g. Hoskyns and Rai 2007; Power 2004). While women play an important part in agricultural production, it is also likely that their contribution to production activities are constrained by their responsibilities for household chores. As we will see below, these limits to women’s time may lead them to look for production opportunities close to the homestead or with minimal requirements for labour input.

In relation to the marketization resources needed to earn income from produce, feminist economists emphasise that markets are gendered institutions, shaped by social relations (Benería et al. 2016; Elson

1993; Elson and Cagatay 2000). Harriss-White (2005), for example, shows that women’s possibilities to benefit from market exchange are limited by gendered constraints to access to information, control over processing facilities, transport and productive resources. With this in mind, we review what the literature has to say about women’s possibilities to benefit from commercialisation of their production in multifunctional landscapes.

Materials and methods

The following text is the result of a directed search based on a number of keywords (listed in Table 1), in two key databases (Scopus and Google Scholar), as well as websites of dedicated research institutes including ICRAF (World Agroforestry Centre) and CIFOR (Centre for International Forestry Research). A screening of abstracts was conducted to exclude a small number of obviously irrelevant posts. The search was also complemented with literature found in bibliographies of articles found in the initial searches, through backward reference list checking (Gough et al. 2012). Additional literature, already known by the authors, dealing with the themes of the review, but which did not come up in searches, was also added to the list. A list of the articles reviewed is included in the “Appendix”. It is not meant as a systematic review of the literature available relating to gender and women in food production in multifunctional landscapes, but examines previous research findings based on the theoretical framework presented above.

A third of the 104 articles reviewed deal explicitly with issues of food security (Table 2). About half of the publications identified in our searches have a specific focus on gender and/or women. One quarter include women as a variable, but do not have it as a main focus, and the rest do not refer specifically to gender or women. Of the 104 publications reviewed, fifty-seven are focused on Africa, either specific countries or in a regional analysis. A quarter of the articles have a global scope, and the rest look at Asia or Latin America. Forty-two of the publications deal with forests and agroforestry systems, almost a quarter are about livestock systems, and the rest deal with agricultural systems, including homegardens, mixed crop systems, and urban agriculture. While we had initially planned to include in the analysis landscapes

Table 1 Principal search terms

women OR gender
 AND
 “food security”
 AND/OR
 production
 AND
 “multipurpose landscape” OR “multifunctional landscape” OR parkland OR “integrated crop” OR “mixed crop” OR
 agroforestry OR “tree crop” OR homegarden OR urban peri-urban agriculture OR enclosure OR livestock

Table 2 Characteristics of the reviewed material

	Thematic scope	Number of articles
	Food security	35
	Gender or women	52
	Women included but not in focused on women	26
	Forestry or agroforestry	42
	Livestock	22
	Agricultural systems; homegardens, mixed crop systems and urban agriculture	40
	Homegardens, mixed crop systems and urban agriculture	
	Geographical focus	
	Global scope	26
	In Africa	57
	In Asia or Latin America	21
A full list of reviewed articles can be found in the “Appendix”	Total number of articles reviewed	104

involved in climate change mitigation, the lack of relevant literature concerning food security and gender in such landscapes led to their non-inclusion.

Productive resources

Access, ownership and rights to land and trees

Ownership, user rights and other types of access to land and trees shape production opportunities for both men and women. In landscapes characterised by the presence of trees, including forest and agroforestry lands, such tenure and access rights are often complicated and multi-layered and structured by gender, ethnicity and other social relations, as shown in numerous case studies (e.g. Fortmann 1995; Rocheleau and Edmunds 1997; Rousseau et al. 2016; Westholm 2016).

In Sub-Saharan Africa, women’s access to trees and their fruits, are often conditioned on their relationship to men, e.g. their husband, and they stand to lose access in case of divorce (Parrotta et al. 2015). This is the case in many parts of the world also for access to land (Lastarria-Cornhiel et al. 2014). Also in settings where community organisations are in charge of management and/or distribution of access rights, women’s rights are often legitimated and mediated through their relation to men, including their husbands and male community leaders. In some countries, formal laws are more progressive in granting women land rights, and this can affect management practices. For example, several studies have shown that women with knowledge of their land rights are more likely to plant trees (Deininger et al. 2008; Quisumbing and Kumar 2014).

The limitations in women’s access to land has led to a greater dependence on products from open access or

low-value land. Non-timber forest products (NTFPs) are one type of product often subject to relatively open access. In many settings, women are the main collectors of such products (e.g. Ibnouf 2009; Shackleton et al. 2011; Westholm 2016). Sunderland et al. (2014) find that women dominate wild plant food collection in Asia and Africa, but not in Latin America. Several studies in Mai et al.'s (2011) review of gender analysis in forestry research, found that women's greater dependence on income from NTFPs was due to their limited access to alternative incomes. NTFPs are often considered secondary to the primary (male) products including agricultural crops or timber. Nevertheless, they provide an important source of food and contribute to the diversification of diets, which is important for food security.

Women's limited access to land also has effects for their practice of urban agriculture, the importance of which has grown in the context of rapid urbanisation, now constituting an important source of food and income for many poor people. Competition for land in urban areas is often fierce. Nabulo et al. (2009) found that women in Kampala, Uganda, due to their lack of ownership and control over land, were more likely than men to grow food crops on contaminated lands, making them vulnerable to health risks.

An alternative strategy to turning to marginal or open access products is seeking modes of production that require little land. One such example is small-scale poultry production, which requires little space or input from farmed land. In Africa, rural, small-scale poultry production contributes 20–30% of total animal protein intake, and is a source of important micronutrients (Wong et al. 2016). Extensive or semi-intensive poultry production, where chicken scavenge for food, or receive some supplementary feed is usually accessible also to the most marginalised groups at highest risk of food insecurity. Rearing and production, and the resulting food or income, is often controlled entirely by women (Wong et al. 2016), although in some contexts women play an important part in caring for the animals, but do not have full control over benefits gained, or decision-making about the use of birds and eggs (Guèye 2003). As we elaborate in the coming sections, the accessibility of poultry production is further enhanced by its limited requirement of other inputs.

Regardless of the overarching trends, women's customary tenure and use rights may be strong in some

contexts, but due to their informal nature, they risk being overlooked and marginalised in the introduction of laws, policies or projects are introduced (Quisumbing et al. 2015; Stloukal et al. 2013). In her study of the formulation of a REDD+ program in Burkina Faso, Westholm (2016) found a lack of understanding among policy makers of the customary organisation of access to NTFPs, structured by ethnicity, due to the absence of women's voices in the policy process. This led her to warn that policies aimed at increasing their value risked marginalising certain women's use of shea and *néré* fruits and leading to increased conflicts and competition for these products. This underlines the importance of policies aimed at production, use and/or trade in forest and tree resources to be designed with awareness of, and sensitivity to, local, informal institutions and relations of power. Otherwise even policies that benefit some groups risk increasing food insecurity for others.

Control over labour and time; staying close to home

The organisation of labour and time is another important factor in shaping gendered roles in food production. Women's traditional responsibilities in the homestead, including cooking and childcare, often limits their possibilities to take on work far away from home. The multiple tasks demanding their time limit their possibilities to engage in additional time-consuming activities. As the literature shows women often find strategies to work around such limitations within traditional gender roles. For example, women have been found to own and/or manage small livestock or poultry to a larger extent than men, due to limited access to land and discussed above, but also due to such animals requiring less work, and that they can be kept close to the house (Galiè et al. 2015).

Poultry farming can easily be combined with other income-generating roles and household tasks, as shown for example by Hovorka (2006) in her study of women in low-income households in Gaborone, Botswana. Lacking access to commercial agricultural land, they managed to take advantage of the opportunities arising from operating poultry enterprises from their residential plots. By operating within their community, not in distant agricultural plots, they could more easily draw on support and linkages with their communities. The women managed to establish

effective marketing channels within their residential areas, selling produce directly from their doorstep, thereby eliminating the need for storage, refrigeration and processing. This way, the disadvantage in terms of limited access to land and time constraints were drawn upon to their advantage. Hovorka (2012) writes that this development has enabled empowerment and new identities for women as independent, urban, entrepreneurs, rather than rural subsistence farmers and reproductive care takers.

In both urban and rural areas, homegardens, or backyard plots, are important to women's contribution to household food security. Ibnouf (2009) in a study in the Sudan, found that crop diversity in homegardens fully controlled by women is often greater than on the family fields, with crops including vegetables, beans and fruits. In Bangladesh women have also been found to play an important role in management and decision-making concerning homegardens (Akhter et al. 2010). Although homegarden management is not always a female activity, as Galhena et al. (2013) observe, the location in or near the homestead makes it easier to combine homegarden management with other household chores. In the Sudan, Ibnouf (2009) found that women's contribution to household food security is larger than men's, and the hours they spend on related activities longer. These activities can be undertaken close to the homestead, and include processing and preservation of agricultural and forest products in order to improve shelf life, thereby enhancing dietary diversity of the household.

Control over capital; the opportunity of small livestock

Gendered differences in control over, and ability to accumulate, capital also shape food production. Capital investments in food production can take many forms, including agricultural inputs and technology. Women's access to agricultural inputs is often more limited than for men, partly because they practice subsistence, rather than commercial agriculture, and therefore have less cash to spend. As shown by Cadzow and Binns (2016) in the case of urban agriculture in Sierra Leone, women often bear the main responsibility for paying household costs such as food, schooling and health expenses. This means that men have more possibilities for taking risks in their entrepreneurial endeavours. Galhena et al. (2013) note

that homegardens not only provide opportunities for those with limited access to land and time, as discussed above, but can also enhance food security for those with limited capital. They show that crop production in homegardens is often integrated with livestock and/or poultry production.

Livestock is the main form of capital discussed in the literature we have reviewed. Assets in terms of livestock are often easier for women to acquire than land or other physical or financial assets (Kristjanson et al. 2014). As shown in studies from across the world, women invest in, and accumulate, capital in livestock. Although women are often considered more likely to own small livestock, gender roles and relations vary over between regions and cultures, and over time (Kristjanson et al. 2014: 213). In the West Pokot region in Kenya women have become more involved in management activities and decisions relating to livestock as processes of land enclosure have led to a shift from pastoralism to sedentary livestock keeping (Karmeback et al. 2015).

In many contexts, women are more likely than men to acquire their livestock through non-market channels, as gifts, inheritance, or through development projects. The informality often characterising women's livestock ownership puts them at greater risk of losing their assets (Kristjanson et al. 2014). Efforts to formalise ownership may therefore be beneficial for women. In a study from Tanzania, Ethiopia and Nicaragua, Galiè et al. (2015) show that the understanding of ownership and access to livestock resources is shaped by a variety of layered arrangements of management and access to benefits. The lived experiences of ownership and distribution of resources revealed institutionalised gender bias in favour of men. As discussed above in relation to NTFPs, for policy makers or project developers aiming to enhance food security, understanding how such access to resources and benefits plays out in the local context is crucial in order to avoid adverse impacts. Similarly, Petitt (2016) shows that cattle ownership in Botswana does not simply follow the gender roles which associate cattle with men, but are intersected by a range of social categories such as ethnicity, race, class and marital status, which play an important role in shaping ownership and access patterns. She observes that it is sometimes easier for women without a predefined 'traditional' role in cattle production to

obtain independent control as owners and managers of cattle (Petitt 2016: 215).

Marketization resources; windows of opportunities

Subsistence and household limits

The same gender inequalities that affect women's productivity in agriculture shape their performance in value chains (Rubin and Manfre 2014). Although explicit monetary values are rarely found in the literature, women have been found to derive a larger share of their income than men from NTFPs in case studies from different parts of the world (e.g. Ouedraogo et al. 2013), and in a global comparison by Sunderland et al. (2014). Nevertheless, men tend to collect a larger share of the income from sales of both processed and unprocessed forest products (Sunderland et al. 2014). Women's production in kitchen gardens and urban agricultural plots is often aimed at subsistence rather than commercialisation and plays an important role in feeding families (Hovorka et al. 2009). Planners tend to prioritise commercial production and overlook subsistence production. In order to support and enhance the contribution of urban homegardens to food security, there is a need for greater recognition from planners.

Women's possibilities for earning incomes from tree products are often constrained by the traditionally gender differentiated roles they are assigned in value chains. As discussed above in relation to land rights and NTFPs, men tend to control crops that are more easily marketable, or earn a higher market value. While women deal with retail trade, men are more often involved in wholesale trade (Kiptot et al. 2014). Elias and Arora-Jonsson (2016) show that although shea nut value chains in Burkina Faso provide income earning opportunities for some women, profits are often concentrated in the hands of wholesalers. Mai et al. (2011) found several studies showing that women's limited access to technology for processing forest products left them at a disadvantage in value chains, suggesting that promotion of technology and knowledge for women could promote their success as entrepreneurs.

Non-market channels

In addition, women risk being out-competed by men in market exchange, because men tend to have more control over assets required for benefiting from trade. Evidence of men taking over parts of a value chain as profitability increases, pushing out women, is available from multiple studies of NTFP trade (Belcher and Schreckenberg 2007; Ingram et al. 2014; Shackleton et al. 2011). In the context of fuelwood trade in southern Burkina Faso, Zougouri (2008) found that women lost opportunities and had worse bargaining positions, because their contacts with traders and wholesalers were often mediated by men. Similarly, Karmebäck et al. (2015) found that as poultry production in West Pokot, Kenya, became more commercialised, more men started to get involved as middlemen in poultry trade.

To maintain control over their products and sales, Saussey et al. (2008) have shown that women in Burkina Faso often retain a share of their Shea nuts, rather than selling them to Shea cooperatives, in order to sell them on the local market. In a similar vein, Arora-Jonsson (2013: 223–225) found that women in India opted out of the mainstream market, and instead chose to trade their bamboo goods with each other, in order to maintain control. There are also examples where new patterns of commercialisation have provided an opportunity for women, as shown by Petitt (2016) in the case of cattle ownership in Botswana. She observes that women's control over cattle was enabled by, as well as enabling, new gender relations. Changing gender relations resulting from broader economic and social processes made it easier for women to obtain access and control over cattle, a traditionally male resource.

One obstacle to women's market activities can be the traditional division between public and private space, where women's movement in public space is limited by societal norms which define a woman's place to be within the household. Social and economic processes may lead to a change in gendered norms. Karmebäck et al. (2015) found that the expansion of the monetary economy in Kenya prompted women to take greater part in market activities in order to earn income, and expanding their independence to move beyond the homestead. This led to women taking on roles in spaces previously unavailable to them. Thus, while gender inequalities constitute severe obstacles

to women's opportunities, there are examples in the literature of how gender roles change and provide new openings for women. To reduce gender equality more broadly, however, policy action is needed.

Opportunities, challenges and recommendations

Multifunctional landscapes can provide opportunities for women to improve the food security and production for themselves and their families in a context of limited access to productive resources such as land, labour and capital inputs. However, the role of multifunctionality of landscapes for women's opportunities to enhance food security is rarely explicitly examined or discussed in scientific literature. We argue that by paying attention to the multifunctionality of landscapes it is possible to highlight the opportunities provided by a diversity of modes of production and products in a context of gender inequality. Wild plants and fruits from forests can constitute important complements to otherwise monotonous diets, and diversify incomes. Home gardening systems can provide sources of nutrients or income by allowing production to be combined with other household chores. Production of small livestock and poultry provide opportunities for producing food with relatively small requirements for land, labour or inputs.

Female products: secondary and low-value

As our review has highlighted, "female products" produced in multifunctional landscapes, such as NTFPs, are often of secondary importance or have a lower economic value than other products produced in the same landscapes. In addition, women's production of poultry, small livestock, or produce is often small-scale because of their limited access to land and capital, or due to time and labour constraints (e.g. Galhena et al. 2013; Galiè et al. 2015; Wong et al. 2016). They risk being disregarded in decisions related to land use or management or in policy making. Awareness of the range of products and services produced in multifunctional landscapes, and how access to, and decision-making about these products is organised, is key for policy makers aiming to enhance food security. Otherwise there is a risk that certain groups or products are marginalised by policy interventions, as Westholm's (2016) example from Burkina Faso showed.

Barriers to market entry

A range of studies from varying contexts, including NTFPs, fuelwood and poultry production, point to the risk that increased value of a product may lead to men, or other powerful groups, taking control of production or part of the value chain for commercialisation (e.g. Ingram et al. 2014; Karmebäck et al. 2015; Shackleton et al. 2011). While this is not always the case, it is a risk that needs to be taken seriously by policy makers in the formulation and implementation of policies aimed at empowering women by promoting processing and commercialisation of traditionally "female products".

Multiple opportunities in multifunctional landscapes?

This unstable nature of gender relations can work in women's favour. Notably, several examples in the literature of how changes in gender relations can come about in the context of changing external circumstances, such as urbanization, a shift from pastoralism to a sedentary way of life, or an expansion of the monetary economy (e.g. Hovoroka 2006; Karmebäck et al. 2015; Petitt 2016). While such changes may imply a risk, as noted above, of women losing control or access over resources, it may also provide an opportunity for previously disadvantaged groups to seize power or control over resources, which were previously unavailable to them. Such opportunities may arise in contexts where traditional gender and power relations are disrupted by changing circumstances, providing opportunities to claim new roles and identities, beyond those traditionally available.

Research gaps and conclusions

We have identified a few areas where further research could increase the understanding of the nexus of gender and multifunctional land use for food security. First, there is little quantitative data on the role of multifunctional land use for food security and production, not least from a gender perspective and compared to other land uses. Secondly, explicit analysis of the monetary values of 'male' and 'female' products in multifunctional land use systems are scant.

Finally, for women to become equal player in terms of availability, access, utilization and stability in food security and food production, there is a need for active and deliberate policy making. It is worth repeating that gender relations need to be analysed and understood in context to avoid adverse effects of policies. This relates both to the risks involved and the opportunities that interventions can bring about. There is also a need for awareness of the instability of gender roles, and how they may change in unexpected way as a result of policies or social processes. Finally, it is important to stress that in order to improve gender equality in any context, there is a need for social policy that allows women the basic security needed to make their own choices and take chances.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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Appendix: Articles reviewed

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