

Forests, food security and gender

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Forestry and agroforestry systems are not gender-neutral. Empowering women could create significant opportunities for greater food security in developing countries.

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Forests and trees on farms are a direct source of food, cash income and a range of subsistence benefits for billions of people worldwide, but there are major differences in the benefits that accrue to women and men. Women in developing countries are frequently disadvantaged in their access to forests and economic opportunities in the forest sector because, compared with men, they usually:

- have lower levels of literacy, education, physical abilities and technical skills, less access to services such as extension and credit, greater constraints on their time and mobility, and limited access to markets and market-related information;
- face discrimination in conventional forest, tree and tree-product ownership regimes;

A woman and a girl harvest coffee beans in a homegarden in Lempira Sur, Guarita, Honduras. Women in developing countries are frequently disadvantaged in their access to economic opportunities in the forest sector

- shoulder the burden of domestic and childcare responsibilities;
- participate less in rural institutions, for example forest-user groups;
- face gender-differentiated behavioural norms and social perceptions of women's roles.

These disadvantages often result in gender disparities in, for example, access to and use of forest foods, woodfuel¹ and fodder for livestock; forest management;

¹ Woodfuel comprises unprocessed wood (firewood, called "fuelwood" here) and processed wood products, such as charcoal and sawmill offcuts, used for fuel.

and the marketing of forest and tree products. This article expands on some of these disparities and makes a case for gender equity in increasing food security and nutrition in poor rural communities.

GENDER DIMENSIONS OF THE FOREST-FOOD SECURITY NEXUS

Food from the forest

Wan, Colfer and Powell (2011) demonstrated that the gender-based division of agricultural labour and food production, combined with the fact that women often have fewer alternative income-earning opportunities than men, means that women tend to collect forest foods to supplement the nutrition of their households. Women play a particularly important role in collecting and processing edible wild plants from forests, as well as in the preparation of household meals by using forest foods to cook (for example) soups, stews and relishes (Vinceti, Eyzaguirre and Johns, 2008; FAO, 2012). Women often have substantial knowledge concerning the identification, collection and preparation of highly nutritious forest foods that can complement and add flavour to the staples of family meals. In addition, income generated by women

from these activities adds to the purchasing power of households and therefore their food security. Men are more likely than women to be responsible for collecting wild honey, birds' eggs and insects, hunting wild animals, and fishing (Shackleton *et al.*, 2011; IFAD, 2008). In some places (such as in parts of the Congo Basin and the Peruvian Amazon), such activities provide the primary sources of animal protein for rural people (FAO, 1992).

Agroforestry

There is evidence that agroforestry activities are often gender-differentiated: while men are usually interested in trees (often of only one or two species) for commercial purposes, women are more inclined to favour multipurpose trees of a number of species for subsistence use, such as those that provide food, fuelwood and fodder and help improve soil fertility. A review of 104 studies of gender and agroforestry in Africa (Kiptot and Franzel, 2011) confirmed that women's participation is very high in enterprises such as the production and processing of indigenous fruit and vegetable products, apparently because indigenous species require fewer labour

inputs. The review also showed that, in Africa, the extent of women's involvement relative to men in activities such as soil-fertility management, fodder production and woodlot-growing is fairly high in terms of the participation of female-headed households but low when measured by the area of land such households allocate to these activities and the number of trees they plant. In cases where women have low involvement, this is due mostly to a scarcity of resources, especially land and labour (partly because women tend to do more household and care work than men), and to differences in male and female opportunity sets. Some studies have also noted that, compared with men's fields, women's farm plots tend to have a greater number of trees and more species, possibly because women like to have trees near the homestead as well as a diversity of species with which to maintain the health of their children and broaden the household food supply (FAO, 1999).

Tree tenure – the ownership and use rights of trees – is often differentiated along gender lines, and men usually have overall authority over high-value tree products. However, the gendered nature of access to and control of trees, tree products and related resources is often highly complex, depending on social and ecological conditions and factors such as landscape niche, time, species, products and uses (Rocheleau and Edmunds, 1997). In many settings, women's rights are substantial due to the informal (and often negotiable) nature of customary laws and, in some cases, the complementarity of women's and men's productive roles. Women's rights, however, can easily become marginalized or may not be recognized, especially in the introduction of statutory laws and formal administrative procedures at the local to central government level (Quisumbing *et al.*, 2001).

Although women often make significant labour contributions to agroforestry (e.g. by planting, weeding and watering trees), their opportunities in the sector are often limited to low-return activities that are of

Women and forest vegetables in East Usambara

In the East Usambara Mountains in the northeast of the United Republic of Tanzania, the consumption of traditional leafy vegetables is the best predictor of children's overall micronutrient intake. The majority of leafy vegetables consumed in the area are wild-collected by women in fields, field margins, fallows and agroforests. Survey data show that, in the wet season, 46 percent of children aged 2–5 years consume vegetables on a daily basis, while in the dry season only 22 percent of children are able to do so. Proximity to the forest is a key determinant of vegetable consumption, particularly in the dry season. Local women reported that those who were poor and lived far from the forest had to spend a significant amount of time collecting vegetables. In addition, even though they had legal access rights, many women were hesitant about entering reserved forests to collect vegetables for fear of being suspected of illegal activities or of encountering others engaging in such activities (e.g. pit-sawing, mining and hunting). In this setting, having areas with tree cover on the family farm and near the home supports year-round access to vegetables, with the potential to decrease women's workloads and improve the nutrition of their families.

Source: Powell, Hall and Johns (2012)



A woman shows how to harvest mfumbwa leaves (*Gnetum africanum*), a popular wild food in central Africa, without destroying the plant. Women play an important role in collecting and processing edible wild plants from forests and preparing them for household meals

Rocheleau and Edmunds (1997) reported that, among the Akamba community of eastern Kenya, tree-planting and felling were primarily the domains of men, while women enjoyed use and access rights to fodder, fuelwood, fruits and mulch. Gender-differentiated rights and responsibilities in agroforestry are also an important determinant of the adoption of agroforestry technologies and the use of related services, and this differential uptake of technologies may (if other things remain the same) further perpetuate existing gender inequalities.

Woodfuel and household energy

Limited access to woodfuel – for example due to environmental degradation or local forest regulations – can cause households to change what they eat, potentially leading to malnutrition. Similarly, boiling water insufficiently to save fuel can contribute to the consumption of contaminated water and poorly prepared food, with potentially life-threatening consequences, especially for children, pregnant women, the malnourished and the sick.

In many agrarian settings, women and girls have the primary responsibility for collecting fuelwood for household use and may have to walk for several hours, frequently in insecure conditions, to do so. In refugee and conflict situations, women are particularly vulnerable to gender-based violence while collecting fuelwood (WFP, 2012).

Shrinking access to fuelwood near the home – which is becoming a pressing reality in many developing countries – and the time taken to collect it often mean that women have less time for other activities (Wan, Colfer and Powell, 2011). Gbetkom (2007) concluded that constraints on women's income-earning potential caused

little or no interest to men, while men tend to control the production and marketing of high-value products as well as the use of the income so generated (Rocheleau and Edmunds, 1997). Tree products such as charcoal, logs, timber, large branches and poles are typically considered male domains. Thus, in the Luo and Luhya communities in western Kenya, women

have the right to collect and use fruits but are restricted from harvesting high-value timber trees. On the other hand, species such as *Sesbania sesban*, which produces good fuelwood and can help improve soil fertility, is considered a women's tree, and therefore women have the right to plant, manage and use it as they please (Franzel and Kiptot, 2012).

A woman carries fuelwood near Mbeya, the United Republic of Tanzania. Women and girls often have the primary responsibility for collecting fuelwood for household use and may have to walk for several hours, frequently in insecure conditions, to do so



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by the scarcity of fuelwood may have significant impacts on household food security. The increased time spent gathering wood leaves less time for cash-earning activities and for tasks to support the food security and health of families, while the purchase of increasingly expensive woodfuel leaves less money to buy food.

Women are not always the main fuelwood collectors (Sunderland *et al.*, 2012). For example, when the distances become too great for fuelwood collection on foot, or where there are naturally low densities of fuelwood (e.g. in the Kalahari), men tend to assume the role of fuelwood collection, making use of transportation such as donkey carts and small trucks. Men are also the main collectors of woodfuel, including charcoal, for sale (Zulu and Richardson, 2013). In Latin America, men are overwhelmingly responsible for woodfuel collection.

With regard to the cooking environment, the combustion of biomass (including woodfuel) releases significant quantities of pollutants that damage the health of those who do the cooking, the vast majority of whom are women. Exposure to indoor smoke has been found to be responsible for 39 percent of deaths due to chronic pulmonary disease in women, compared with 12 percent in men (Wan, Colfer and Powell, 2011; Rehfuess, 2006). Disease and nutrition are linked: infections associated with wood-smoke exposure significantly increase women's nutrient requirements (e.g. vitamin A), and those who are micronutrient-deficient are more likely to develop infections after exposure to wood smoke.

Fodder for livestock

Many tree species found in forests, woodlands and parklands and on farms are

used for animal feed; they may be browsed directly by roaming livestock or collected and fed to livestock in stalls. It has been estimated, for example, that 75 percent of tree species in tropical Africa are used as browse by domestic livestock such as sheep, goats, cattle, camels and donkeys (FAO, 1991). Women (and children) play crucial roles in gathering animal fodder (including from trees), feeding and grazing animals, cleaning animal sheds, and composting animal waste. These activities contribute significantly to domestic livestock production, which in turn influences milk and meat supply and contributes to household income. Tree-based fodder is also used to sustain draught animals for ploughing and in the production of manure – which increases soil fertility and is used as cooking-fuel (especially when woodfuel is in short supply).



Farmer Patricia Oduor and extension worker Gabriel Malowa chat in an agroforest in Siaya District, Kenya. Women and men often have highly specialized knowledge of forest flora and fauna, but it is not always acknowledged or used in modern systems

Forests and climate-change adaptation

Women may be more vulnerable than men to the effects of climate change because they are more likely to be poor and dependent on natural ecosystems threatened by climate change (IPCC, 2007; Lambrou and Nelson, 2010). They are also effective actors and change agents for climate-change mitigation and adaptation (Peach Brown, 2011). Women often have a strong body of knowledge and expertise that can be used in strategies for disaster reduction and climate-change mitigation and adaptation. Moreover, women's responsibility in households and communities as stewards of forest foods and other forest-related and tree-related resources means they are well-placed to develop livelihood strategies adapted to changing environmental conditions. As natural-resource managers, women influence the

total amount of genetic diversity conserved and used, often working to counter decreases in biodiversity caused in part by the favouring by men of cash-oriented monocultures (World Bank, FAO and IFAD, 2008). It follows that forest policies and programmes that aim to be socially responsive should take into account the gendered dimensions of resource use, needs, access, knowledge and strategies for coping with climate change.

GENDER DIFFERENCES IN FOREST-RELATED KNOWLEDGE

Men's forest-related knowledge is often regarded as knowledge that "counts", and the knowledge held by women is not always properly recognized in forest management plans and forest use. Both women and men often have highly specialized knowledge of forest flora and fauna in terms of species diversity, location,

harvesting and hunting patterns, seasonal availability, uses for various purposes, and conservation practices.

Much of the existing literature, typically based on case studies, paints a stylized picture in which women derive their knowledge from their specialized roles in the collection and processing of forest products for direct household use and limited sale in local markets, while men tend to specialize in the harvesting of timber products and wild meat for cash income and marketing. However, the extent to which such findings can be generalized is unclear. Data from 36 long-term studies of forest-proximate communities in 25 countries in Africa, Asia and Latin America, representing more than 8 000 households, confirm that women and men tend to collect different forest products (Sunderland, 2011). Contrary to conventional wisdom, however, the data

show that both women and men collect non-timber forest products (NTFPs, which can include woodfuel) primarily for subsistence and that men's sale share is generally higher than women's, except in Africa where the share is roughly equal (Sunderland, 2011). This finding indicates that while gender differences in forest-relevant knowledge exist (particularly about processing and marketing), they may not be as clear as previously thought, and a range of factors – such as marital status, age, wealth and formal education – in addition to gender may co-determine how people use forests.

Nevertheless, women's knowledge tends to be linked more directly to household food and nutrition needs as well as to health and culture, compared with men's knowledge (Daniggelis, 2003). A study in Amazonia (Shanley and Gaia, 2001) found that, compared with men, women were able to identify a broader range of plant species (i.e. trees, vegetables, vines, bushes and herbs) and usable plant parts (i.e. fruits, barks, leaves, seeds and roots). Such knowledge is particularly important in natural disasters and food crises, when the collection and sale of forest products by women often become critical for household survival. In many places, women's familiarity with tree products such as fruits and nuts, medicinal materials and woodfuel plays a crucial role in coping with food shortages. Moreover, the nutritive value of wild foods is often substantial and can be used as a substitute for purchased food items.

Traditionally, women have been the primary domesticators of forest-based food and medicinal plants that are now found in homegardens worldwide (Kumar and Nair, 2004; Eyzaguirre and Linares, 2004). In humid western and southern Africa, rural women play a particularly important role in the cultivation of indigenous fruit trees (e.g. *Irvingia gabonensis*, *Dacryodes edulis* and *Sclerocarya birrea*) (Campbell, 1987). While men may be the nominal owners of trees, women are often responsible for the marketing of fruits and,

importantly, are often able to decide how the income is used. Nevertheless, women's participation in tree domestication has been hindered by limited access to and control over land and trees, insufficient information on the requirements and advantages of tree domestication, and substantial periods of production inactivity due to their childbearing and childrearing roles and their heavy workloads in the household (Degrande *et al.*, 2007; Degrande, 2009).

GENDER DIFFERENCES IN FORESTRY VALUE CHAINS

As they are for most primary products originating in developing countries, NTFP value chains are highly gender-specific. In many settings, women deal primarily with products of relatively low economic value, engage in less lucrative informal activities, and do not have the same access to technology, credit, training and decision-making as men. Unsurprisingly, interactions between women and men and the division of labour between them at each stage of a value chain depend heavily on the environment in which they live, their livelihood preferences, and the available technology. In general, women tend to prefer flexible working conditions that do not clash with their day-to-day household responsibilities (CIFOR, 2012).

Engagement in forestry value chains is often crucial for rural women's livelihoods and the well-being of their households. In Ethiopia, for example, sorting and cleaning gums and resins is the primary source of income for 96 percent of the women involved in the activity; in Burkino Faso, women engaged in sorting gum arabic reported that it was their most important source of income for 3–4 months per year (Shackleton *et al.*, 2011). Many researchers have also noted that increases in women's incomes have greater impacts on food, health and education expenditure and therefore on overall household well-being than increases in the incomes of men (e.g. Blumberg, 1988; Hoddinott and Haddad, 1991; Kabear, 2003).

The gender roles in forestry value chains are generally poorly understood and not well supported by policy-makers and service providers, especially those who focus on hi-tech operations or pay less attention to local markets. Gender-sensitive value-chain analyses can identify less-visible gender-sensitive components at various stages of value chains. These might include processing at home; informal trading in neighbourhood markets; and the collection, by men, of certain non-wood forest products such as gums and honey if it requires physically taxing work or is carried out in remote areas. Thus, analysing value chains from a gender perspective can be useful in identifying practical opportunities for improving the livelihoods of the rural poor.

GENDER BALANCE IN FOREST-USER GROUPS

Strengthening gender equality in rural societies is generally recognized as a necessary prerequisite for increasing agricultural productivity, reducing poverty and hunger, and promoting economic growth. The forest sector provides a broad range of opportunities to empower rural women. Here, we discuss increasing the participation of women in forest-user groups.

Women are generally under-represented in forest-user groups such as village forest committees and community forest associations (Coleman and Mwangi, 2012). In many settings, rules allowing only one person per household to participate in such groups tend to exclude women, and women often become involved in decision-making only after forest and tree resources have become degraded. As a result, community forest groups sometimes enforce rules and regulations that do not fully reflect women's strategic interests and needs.

Female-dominated groups tend to have more property rights to trees and bushes and to collect more woodfuel and less timber than do male-dominated or gender-balanced groups (Sun, Mwangi and Meinzen-Dick, 2011). Gender-balanced groups, on the other hand, perform

consistently better in all forestry functions (e.g. the protection of plantings, forest regeneration, biodiversity conservation, watershed protection and the allocation of forest-use permits). Pandolfelli, Meinzen-Dick and Dohrn (2008) found that gender-balanced groups capitalize on the complementary roles of women and men, mobilize people for collective action, and enable better access to information and services from external agents. The greater involvement of women in forest governance may thus help ensure that forest policies and planning are more sensitive to the food-security needs of communities.

Sun, Mwangi and Meinzen-Dick (2011) found that the relationship between the gender composition of groups and collective outcomes is not linear. Evidence

compiled by Agarwal (2001, 2010), Sun, Mwangi and Meinzen-Dick (2011) and Coleman and Mwangi (2012) suggests that when women constitute one-quarter to one-third of the membership of local forest management institutions, the dynamic changes in favour not only of the consideration of women's use of and access to forest resources but also towards more effective community forest management decision-making and management as a whole.

The active and effective participation of women in forest institutions is governed by a number of factors in addition to the proportion in which they are represented. Agarwal (2010) and Coleman and Mwangi (2012) found that, in Honduras, India, Nepal and Uganda, the gender composition of forest councils and the age and

education levels of the women on those councils significantly affected women's attendance at meetings and the likelihood they would speak up on critical issues.

There is evidence that women's participation in the decision-making of forest institutions such as forest-user groups reduces the level of gender-based conflict. This is because participation leads to new rules of access that take women's needs into account, and therefore their activities are less likely to be criminalized or viewed as infringements.

A woman cuts wood on a circular saw in a wood market in Ulaanbaatar, Mongolia. The gender roles in forestry value chains are generally poorly understood and not well supported by policy-makers and service providers



CONCLUSION

Forestry and agroforestry systems are not gender-neutral. Compared with men, women are frequently disadvantaged – for a range of interrelated cultural, socio-economic and institutional reasons – in their access to and control over forest resources and in the availability of economic opportunities.

Empowering women in the forest sector can create significant development opportunities for women (e.g. in terms of income, livelihood diversification, business skills, independence and self-esteem) and can have important spillover benefits for their households and communities in terms of food security, health and education. Women need to be adequately represented in forest-related institutions, accepted as stakeholders with specific views and interests, and empowered (e.g. through formal education, training and support for income generation) to have a say in transformative decisions. Efforts to promote women's inclusion in forest-related institutions will help to maximize synergies between the forest sector and food security, for the benefit of all.

ACKNOWLEDGEMENTS

This article is adapted from: *Forests, food security and gender*, a background paper for the International Conference on Forests for Food Security and Nutrition, by Francesca Guarascio, Nandini Gunewardena, Christine Holding, Susan Kaaria and Libor Stloukal.

The background paper was prepared in close collaboration with Bimbika Bassnet, Carol Colfer, Esther Mwangi, Bronwell Powell and Sheona Shackleton at the Center for International Forestry Research and Anne Degrande at the World Agroforestry Centre. Comments on the background paper by four anonymous reviewers in the FAO Forestry Department and by several colleagues in the Division of Gender, Equity and Rural Employment are gratefully acknowledged. ♦



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