Forests and Food

Addressing Hunger and Nutrition
Across Sustainable Landscapes

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6. Public Sector, Private Sector and Socio-cultural Response Options

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This chapter focuses on political, economic and social response options at national to supranational scales to drivers of unsustainable management of forests and tree-based landscapes and their effects on food security and nutrition. Three different angles are considered: a) policy responses to enhance linkages between food security and forests with a focus on setting up the right institutional and governance structures and addressing the important issue of forest tenure reform; b) market-based response options that focus on global processes for supporting sustainable supply, and innovative corporate and multi-actor initiatives to support inclusive value chains of forest and tree products; and c) socio-cultural response options to enhance food security where the focus is on: changing urban demand; education to change behaviour and improve dietary choices; reducing inequalities and promoting gender-responsive interventions; and social mobilisation for food security.

For the public sector, a central governance issue is how and to what extent policy and regulatory frameworks help ensure that the most vulnerable groups, in particular the poorest members of society and women, have equitable access and rights to food security and nutrition from forests and tree-based systems. To this end, it is important to include relevant actors, from local communities to government departments, and initiate tenurial reform, devolution of decision-making to sub-national levels and a strengthening of institutional capacity at local levels.

For the private sector, sustainability standards supported by multi-stakeholder processes, complement policy frameworks and offer opportunities for change on the ground, particularly if these can include smallholders. In addition, pledges by corporate actors to zero deforestation and sustainable supply will likely have significant influence in shaping future production practices and business models if they include benefits for smallholder rural populations. Co-regulatory approaches that involve both public and private sector actors to achieve more inclusive food systems through innovations and greater valuation of local practices, management systems and knowledge, may in the future further enhance the governance of food systems.

At the level of social responses, education plays a pivotal role in empowering rural populations and has the potential to generate tangible benefits for households and communities in achieving food security and nutrition, sustainable forest and landscape management, and improved health. Targeting women and other vulnerable groups is particularly important to enable greater inclusiveness in decision-making and benefit sharing in forests and tree-based systems. Behavioural change that is often driven by social movements toward the consumption of food with lower environmental impact, particularly in growing urban areas, can have significant positive impacts on rural populations if the value chains necessary to meet the demand are set up to include smallholders and marginalised groups.

6.1 Introduction

*Food security*¹ has become a matter of global concern, in particular since the last food price spikes in 2008 and 2010 (Beddington et al., 2012). FAO projections suggest that food production must rise by 60 percent by 2050 if a growing and increasingly more affluent population of over 9 billion is to be fed (Alexandratos and Bruinsma, 2012). At the same time, our environmental footprint which is leading to large scale soil *degradation*, *deforestation*, loss of *biodiversity*, crop varieties and *ecosystem services*, must be reduced as our current mode of operation is inconsistent with the planet's long-term provisioning capacity (IAASTD, 2009). All current trajectories imply that humanity is moving farther away from safe spaces (Rockström et al., 2009). *Climate change* is further compounding the challenge, for instance by undermining gains in crop productivity through increased floods and droughts, but also through longer-term shifts in temperature and rainfall distribution (IPCC, 2014; Nelson et al., 2010). This highlights the need for more sustainable agricultural methods for food production while knowledge gaps regarding trade-offs arising from competing economic and environmental goals, and key biological, biogeochemical and ecological processes involved in more sustainable food production systems remain (Tilman et al., 2002).

There is now growing recognition for the urgent need to act more decisively against these trends (Beddington et al., 2012). The revived attention to food security and *nutrition* is already leading to more sustained national and international efforts to increase food production and productivity, particularly in developing countries. Several countries, such as Mexico, India and South Africa have enshrined national food security in their constitutions and the United Nations Framework Convention on Climate Change is addressing issues related to the sustainable management of land through a number of frameworks such as REDD+ (Reducing Emissions from Deforestation and forest Degradation, conservation and sustainable management of forests, and enhancement of forest carbon stocks), the Ad-Hoc Durban Platform, and technology transfer (Campbell et al., 2014). At the same time there is a better understanding that food production must rise while enhancing climate *resilience* and lowering agriculture's greenhouse gas emissions' intensity (FAO, 2013a). To provide national and international support to this idea the global Alliance for Climate-Smart Agriculture, a voluntary association of national governments, intergovernmental organisations, development banks, private sector, civil society and research organisations, was launched at the United Nations Climate Summit in September 2014 (GACSA, 2014). It remains to be seen if climate-smart agriculture can deliver on the triple win, and this platform for action can indeed mobilise the financial, political, social and research resources necessary to significantly influence our current trajectories (Neufeldt et al., 2013).

1 All terms that are defined in the glossary (Appendix 1), appear for the first time in *italics* in a chapter.

The growing demand for food, fibre, energy and other products from the land often leads to market pressures for exploitation that can lead to *forest* destruction. Perverse incentives, for instance subsidies that have been set up to address the demand for cheap food without considering environmental externalities, may aggravate these pressures. These and other drivers affect the contribution of *forests and tree-based systems* to food security and nutrition as many drivers of deforestation and forest degradation lie outside the *landscapes* in which they manifest themselves. For example, agriculture is believed to be the driver of up to 80 percent of current deforestation, which often is resulting from national agricultural development policies intended to boost oil palm, cattle or soybean production (Kissinger et al., 2012). While an increase in agricultural productivity can potentially reduce the pressure on forests and other natural *ecosystems*, focusing on one outcome at the expense of others will often lead to sub-optimal results for overall sustainability (Sayer et al., 2013). Taking a landscape perspective that integrates across agriculture, forests and other land uses rather than considering different land use sectors in isolation is increasingly understood as crucial to long-term sustainability and food security and nutrition (Padoch and Sunderland, 2013; Scherr et al., 2012; and see Chapter 5).

This chapter focuses on political, economic and social response options to drivers at national to supranational scales that lead to *food insecurity* and negative nutrition outcomes due to the degradation of forests and tree-based systems. While they often support the sustainable management of land-based natural resources at landscape scales, many of these responses lie outside the land sectors altogether. The chapter addresses the topic from three different angles: a) policy responses to enhance linkages between food security and forests with a focus on setting up the right institutional and *governance* structures and addressing the important issue of forest *tenure* reform; b) market-based response options that focus on global processes for supporting sustainable supply, and innovative corporate and multi-actor initiatives to support inclusive value chains of forest and tree products; and c) socio-cultural response options to enhance food security where the focus is on: changing urban demand; education to change behaviour and improve dietary choices; reducing inequalities and promoting *gender*-responsive interventions; and social mobilisation for food security. Together, they cover a wide range of response options that are available to governmental, corporate and social agents. While these areas are presented separately here, they are strongly interlinked. For example, market forces require national rules and regulations to govern them in ways that are consistent with sustainable development goals but also social and cultural norms and values, which in turn shape the forms that institutions and governance structures take. Therefore topics from different sections within the chapter frequently touch upon each other. The chapter concludes by summarising the different lessons drawn from each of the three areas.

6.2 Governance Responses to Enhance Linkages between Forests and Tree-based Systems and Food Security and Nutrition

6.2.1 Introduction

Given the diverse roles of forests and tree-based systems for food security and nutrition (see Chapter 2), governance responses need to be understood in the widest sense. In this section, we discuss three governance response options: forest tenure reforms, decentralisation and market regulation. This is followed by a review of lessons on catalysing governance reform drawn broadly from the field of innovation studies and governance reform experiences (see Figure 6.1).

Forest governance has historically been a highly contested field, often very different from the agriculture sector which is governed in a more decentralised way (Colfer, 2013). While the forest sector is conventionally governed either for biodiversity conservation or timber production (Kennedy et al., 2001), a shifting emphasis on *non-timber forest products* and participatory conservation has given way to more food-friendly *forest management* practices (Belcher et al., 2005). A key manifestation of these

shifts is rising concerns for food and nutritional security, highlighting the need for more proactive measures to reorient forest governance to address these *livelihood* priorities (Sunderland et al., 2013).

6.2.2 Reforms Related to Tenure and Resource Rights

Who controls forests significantly determines what they are managed for and who benefits from them, both outcomes having profound implications for food security. For example, globally an estimated 13 percent of all forests are officially protected for conservation values (FAO, 2010), but nearly half of these legally protected areas are heavily used (usually illegally) for agriculture and forest product extraction (Scherr et al., 2004). Forest tenure is also linked to land use policy that shapes how benefits can be optimised at the level of land use. Such land ownership issues have gained prominence in the past two decades, resonating Sen's argument that "entitlement" is more critical than production in reducing hunger at the global scale (Sen, 1999). Over the past three decades, forest tenure reforms have seen major strides globally, as manifested in increased recognition of the rights of local communities and/or local governments. Such reforms range from the titling of land parcels to indigenous communities to sharing timber revenues (Larson et al., 2010). At least five forms of tenurial reform can be identified: a) state-community collaborative or joint management, empowering communities to secure their livelihood interests, including meeting their food and nutrition needs, in forest management plans (Sundar, 2000; Bampton et al., 2007); b) formal community rights supported by concurrent reforms in state institutions (Bray and Merino-Pérez, 2002); c) national laws granting rights to communities for forest management, but still focusing narrowly on subsistence use, as in the case of Nepal (Sunam et al., 2013); d) pro-poor forest tenure reforms (leasehold forestry) allowing poor households to grow annual and perennial crops (Thoms et al., 2006); and e) institutional arrangements for enhancing the access of indigenous people to land resources (e.g. indigenous forest rights in Mexico (Toledo et al., 2003)).

However, tenure reforms are frequently insufficient to secure livelihood benefits, including food security. As Larson et al. (2010) argue, "new statutory rights do not automatically result in rights in practice, however, nor do local rights necessarily lead to improvements in livelihoods or forest condition". This can be seen for example in Nepal despite the country having granted clear legislative rights to communities (Ojha et al., 2014; Sunam et al., 2013). A wave of recentralisation is reported from cases elsewhere in the world (Ribot et al., 2006). Even in areas with significant formal devolution of forest authority, many communities have limited rights in practice (Larson et al., 2010).

Recognising the issue of intra-community equity, pro-poor tenure reforms have been initiated within community-based forest management, with explicit rights to grow food and cash crops in forest areas granted to the poorest members of society (Bhattarai et al., 2007). Nevertheless, even in countries promoting participatory or community-based forest management, many policy responses and forest laws

intended to support smallholders and the poorest of society still contain restrictive provisions. As such they fail to authorise food cultivation or other means of enhancing food benefits from forests by smallholders, as is the case for example with India's Forest Right Act. Equally, in Nepal, where community forestry has come of age, with the establishment of successful local institutions, several forest ecosystem services are not yet defined in the tenure policy, thus creating a sense of tenurial insecurity (Sharma and Ojha, 2013).

Overall, forest tenure reform has emerged as an important governance response in relation to linking forest management with food security, despite varied and diverse experiences across the globe. The challenge is often that, even when tenure is redefined, a supportive institutional system – including capacity and political will – to translate the reform into practice remains absent. More attention is thus needed to how local innovations in resource access and control are linked effectively to an enabling policy and institutional environment.

6.2.3 Decentralisation and Community Participation in Forest Management

Another important forest governance response with profound implications on food security is decentralisation of authority (Colfer and Capistrano, 2004). While tenure reforms seek to transfer resource rights, decentralisation has involved much broader processes including institutional reform, power sharing and accountability. Indeed, the past three decades have seen a tidal wave of decentralisation in developing and transitional economies driven by diverse forces: loss of legitimacy of the centralised state (Bardhan, 2002), demands for a greater role of the market and for deregulation (Mohan, 1996), escalating concerns for poverty reduction (Crook, 2003), environmental conservation (Agrawal, 2001) and heightened demands for citizen participation in governance (Ribot, 2003; Ribot, 2007; Fung and Wright, 2001). Decentralisation endeavours entail a varying mix of activities aimed at empowering either communities of citizens, elected local government bodies, or other forms of quasi-political and administrative institutions, and involve political, administrative and fiscal measures depending on the context. Further, decentralisation responses are linked to a variety of ideas that have influenced governance practices such as deliberation (Dryzek, 2010), interactive governance (Kooiman et al., 2008), empowered participation (Fung and Wright, 2001), as well as representation and multi-stakeholder involvement (Hemmati, 2002; Vallejo and Hauselmann, 2004).

Although practices vary, the idea underlying decentralisation is to engage local actors in decision-making through locally-elected authorities to ensure accountable governance. In the forest sector, three forms of decentralisation have been found: transfer of rights to locally-elected government (democratic decentralisation), transfer of power to local offices of the national government ("deconcentration", as seen in Senegal for example (Ribot, 2006)), and transfer of rights to local communities (devolution, as seen in Nepal (Pokharel et al., 2008)).

However, there is no consensus that decentralisation leads to better outcomes in terms of local livelihood impacts and environmental sustainability. Questions of accountability and legitimacy in the exercise of power have become more critical than in the past (Lund, 2006; Mwangi and Wardell, 2012), challenging conventional forest governance authorities. Policies of decentralisation, while intended to “include” communities in multi-level participation, are often distorted in practice (Ribot et al., 2006; Head, 2007). Problems of participatory exclusion persist even in pro-poor environment and development programmes (Agarwal, 2001), and development practice continues to remain separated from politics (Hickey and Mohan, 2005).

Despite Ostrom’s seminal work refuting Hardin’s “tragedy of the commons” (Ostrom, 1990) and promoting the evolution of common property institutions, community action has tended to be smaller in scale, involving face-to-face channels of communication and coordination in practice. Such small-scale approaches are perceived to provide easier solutions for countries with weak and unaccountable governments (Blaikie, 2006). The limits of small-scale, community-based approaches to decentralisation have manifested themselves in various forms. Field experiences demonstrate that beyond a certain point, community effectiveness cannot improve unless supported by larger systems of local governance (Ojha, 2014). Communities may not necessarily be inclusive and accountable internally (Benjamin, 2008; Blaikie, 2006). In Nepal, the successful development of community forestry systems is meeting challenges of internal exclusion, market manipulation, elite domination and timber smuggling – issues that cannot be left entirely to community-level decision-makers (Mohan and Stokke, 2000). In India, the Forest Rights Act aimed to empower local forest-dependent people, but it was not effectively implemented due to inadequate local capacity (Springate-Baginski et al., 2013). In the Philippines, national policy entrusts local communities with rights to manage forests, but actual implementation has remained ineffective due to bureaucracy (Pulhin et al., 2007; Dahal and Capistrano, 2006).

Decentralisation responses should also be seen in the context of the growing consensus that forest governance has become a multi-level process (Mwangi and Wardell, 2012; Ojha, 2014). A multi-scale approach to governance may help to enhance food security by overcoming policy barriers and ensuring policy coherence from production to consumption, to eliminate poor policies (e.g. distorting trade) and to put in place positive ones (e.g. overcoming food waste) (Brooks, 2014).

Decentralisation and community participation remain important tools of forest governance reform to contribute to food security by: a) fostering local level decision-making and land use planning; b) resolving conflicts among different types of forest users; c) forging an effective interface between local knowledge and science; and d) enhancing the sustainability of innovation processes. These are linked to inclusive, accountable and transparent decision-making and equitable benefit sharing arrangements at the local level. In particular, evidence suggests that women’s presence in decision-making has helped to improve forest conservation outcomes (Agarwal, 2009). Wider decentralised responses are important to address intra-community heterogeneity and equity issues, as people who depend on forests for their livelihoods and for food are also the ones

who suffer the problems of inequity and injustice most (Mahanty et al., 2006). This is particularly critical in view of the findings that despite significant rights offered to local communities across the globe, inclusion remains elusive (Agrawal and Ribot, 1999). It is thus important to enhance decentralisation in such a way that it has equitable impacts on the community, while making sure that there is a concurrent reform in governance at multiple scales to support decentralisation.

6.2.4 Regulating Markets

Resource tenure reform is not enough to gain benefits from the market, as illustrated by the case of Mexican forestry wherein 80 percent of forest is owned by communities while they possess only five percent of total processing capacity (Scherr et al., 2004). As Scherr et al. (2004) argue, there is a need to “re-think the potential contributions of small-scale forest producers to commercial production and conservation goals, and ensure that a much higher share of the profits needs to go to local people rather than central governments or private interests”. Stringent regulatory reforms are needed on the sale of forest products from production systems managed by local communities, local governments or state-community partnerships, such that significant incomes can reach poor rural households (Grieg-Gran et al., 2005). Even when communities are given rights to market forest products, the poor are not likely to benefit without regulatory arrangements to mandate community groups to spend the money for the benefit of the poor (Iversen et al., 2006). In Nepal’s community forestry for example, a government directive requires community forestry groups to spend at least 35 percent of community revenue in projects directly related to the livelihoods of the poor (Nepal DoF, 2009).

Box 6.1 Regulatory constraints to community benefits from marketing of forest products

- Tenure rights of local and indigenous people remain weak
- Use rights frequently limit harvested products to those for subsistence use
- Decisions to harvest products commercially are limited by stringent requirements
- Inhibitive regulatory requirements for non-forest sectors (such as transport)
- Policies tend to favour industrial scale logging over community scale operations
- Onerous taxes and fees for forest products at various stages of the value chain
- Requirement for special permits to harvest forest products
- Requirement for special permits to transport goods to market
- Weak governance often leads to lack of transparency along the value chain
- Uncertainty about how to address legal issues including taxation
- Resistance by government officials to relinquish control over forests
- Government officials’ demands for unofficial incentives to provide permits

Source: Gilmour, 2011.

As the markets for environmental goods and services increase globally, benefit sharing has become a crucial question for communities, generating a wide-range of policy and practical responses (Antinori and Bray, 2005; Pandit et al., 2009). At stake are the crucial questions of whether and how communities interact and negotiate with market players, and what agency they wield in these relationships of economic exchange and sometimes political contestations (Pacheco and Paudel, 2010). Studies in forest markets show that communities can benefit only when they have capabilities, necessary support services and suitable regulatory arrangements in their favour (Pacheco and Paudel, 2010). A recent review and analysis has identified several regulatory and governance constraints that prevent communities from benefitting from the marketing of forest products (Box 6.1).

Small-scale producers flourish primarily where there are fewer regulations and subsidies to large industry, and where there are secure forest rights (Scherr et al., 2004). For them, appropriate market regulations include: a) low regulatory costs of market entry (e.g. no registration fees, low cost management plans, no bribes required); b) no producer/consumer subsidies (and hence greater competitiveness for small-scale producers); c) a low-cost regulatory environment (e.g. few permits required); and d) secure local rights for forest products and environmental services (Scherr et al., 2004). These factors are critical in enhancing the commercial use of forest resources for local livelihoods even in situations where formal resource tenure exists.

In recent years, non-state market regulatory arrangements have also emerged such as certification mechanisms (Cashore, 2002; Durst et al., 2006) and payments for environmental services (PES) (also see Section 6.3). Certification chiefly consists in harnessing demand for sustainably-harvested products (including timber and food). In recent years, within both state and non-state frameworks, a policy agenda to support PES has emerged (Wunder et al., 2008) but challenges persist in relation to monitoring and verification. Concerns have also surfaced about ensuring the control of smallholders on genetic resources while encouraging the private sector to deliver improved seeds and technologies. The concern that markets do not favour the poor has inspired a series of instruments such as safeguards and free, prior, informed consent of indigenous peoples in commercial projects (Pimbert, 2012).

Interactions with the market are now inevitable for improving rural livelihoods, and the agenda of enhancing food security from forest cannot ignore this. It is also clear that “laissez faire” approaches to market development neither ensure equitable access, nor are likely to create sufficient conditions for the sustainable management of resources. Hence, regulated markets are an important governance response where a number of issues such as capacity, equity, marketability, fund management and planning, decision-making and others are directly regulated through different forms of governance instruments, while also ensuring ample entrepreneurial freedom and incentives.

6.2.5 Catalysing Governance Reform

In effecting the required change in policy and practice, quite often the issue is more about how a particular process of change emerges or is catalysed by some champions of change, triggered by particular sets of drivers, and sustained by an effective interplay between science and policy deliberations. Scholars and practitioners have considered catalysing changes in governance in the fields of forestry, environment and development in a variety of ways, as shown by a review of approaches (see Box 6.2).

Box 6.2 Approaches to catalyse changes in governance

- **Innovation system approach** (Hall, 2002) emphasises linking research, practice, policy together as essential for improving systems and practices. The approach emerged with industrial innovations in the West, followed by agricultural extension in the developing world, such as in India.
- **Social learning approaches** (Schusler et al., 2003) emphasise open communication, engagement and co-learning as necessary for changing systems. Examples can be found across both Western and developing countries.
- **Participatory research** (Pretty, 1995) holds that research can make a difference when conducted in close engagement with the subjects or local communities. This is applied widely in agriculture and natural resource management in the developing world.
- **Critical action research** (Ojha, 2013) emphasises the role of locally-engaged researchers in catalysing change by acting at different levels to generate alternative and critical knowledge. Examples can be found in developing countries – mainly in South America and South Asia.
- **Knowledge brokering** (Meyer, 2010) and using research as capacity building (Hall et al., 2003) are also emerging tools of innovation. Here, the role of new and hybrid actors as knowledge brokers is important in linking policy, practice and research groups. This idea has emerged in both the West and in the South.
- **Transformative innovation** “needs to give far greater recognition and power to grassroots innovation actors and processes, involving them within an inclusive, multi-scale innovation politics” (Leach et al., 2012).
- Participatory technology development (Schot, 2001) emphasises that technology and institutions co-evolve over time.
- **Adaptive collaborative approaches** (Colfer, 2005; Ojha and Hall, 2012) emphasise that management actions are experiments for learning and conflict management, as problem systems are always emergent and dynamic. Evidence is generated from across Asia, Africa and South America.

In more practical terms, we identify the following strategies to catalyse forest governance reforms so as to enhance food security outcomes:

1. **Reframing the facilitative regime.** Learning and innovation can be seen as the property of a system to self-organise and evolve, but this can be catalysed much faster and with much better results, in terms of fairness and equity

through appropriate mechanisms to inform, support, nurture, enable, capacitate and strengthen relevant groups and organisations involved in innovation development. Such facilitative arrangements are particularly crucial in the forestry sector in which governance has historically been organised around a “command and control” model. Even decentralised systems of forest governance face recentralisation threats (Ribot, 2006; Sunam et al., 2013). Options for forest governance to be more food-friendly include for example establishing demonstration landscape sites, creating incentives and offering subsidies for provisioning services.

2. **Conceptualising cross-scale linking.** Cross-scale linkages involve a diversity of transactions or interactions, and require building coalitions that go beyond technological innovations (Biggs and Smith, 2003). Such cross-scale forums can be harnessed for their potential to generate innovation, enable negotiations, manage conflicts etc. This means for example, inviting forest and food actors together along with farmers and public officials to open up informal spaces to explore and negotiate opportunities to enhance forest-food linkages. The Rights and Resources Initiative (RRI), a research-policy group working on forest rights globally, also promotes such policy fora at national, regional and global levels (RRI, 2014).
3. **Adopting multiple planning horizons.** Conceiving, facilitating and supporting multiple and overlapping planning processes, including forests, landscapes, and subnational and national levels, can help to facilitate change simultaneously at different temporal and spatial scales (Biggs and Smith, 2003). For example, a community forest user group can focus on a 3-5 year planning cycle, while district or landscape level plans traditionally require more time. Similarly, monitoring systems can also be tailored to the needs of decision-makers at different scales of governance, without overburdening local households and communities to gather information that is not immediately relevant to them.
4. **Cultivating local champions of change.** Many success stories in forest governance – and more generally in environment and development – around the world are linked to the strong role of a few passionately engaged agents of change. Identifying and nurturing such champions can be part of the broader strategy of reaching transformative change in forest governance for food security (World Bank, 2003).

6.3 Private Sector-driven Initiatives for Enhancing Governance in Food Systems

6.3.1 Introduction

The global *food system* is undergoing important changes which are associated with a reorganisation of value chains that are becoming increasingly global, the adoption of improved policy frameworks aimed at regulating food production and markets, and the emergence of private sector-driven initiatives to promote the adoption of sustainable practices in the supply of agricultural commodities (e.g. grains, palm oil, beef). The food

system is characterised by increased vertical integration from the local to the global level and the development of large and complex value chains. The architecture underpinning the global food system is growing in complexity with an increasing role of the private sector, mainly large-scale corporate and transnational groups, in organising value chains, as well as multi-stakeholder processes with an active role of civil society groups influencing the governance of value chains at different levels (Margulis, 2013).

With growing foreign investment not only in processing but in upstream production, global value chains are speeding up concentration and technological change. This is stimulated by global traders and transnational companies that are seeking to enhance their economies of scale in both supply and marketing, which ultimately tends to displace local farmers who are integrated into more traditional food production systems (Page, 2013). Retailers and supermarkets also tend to impose higher quality standards to suppliers in order to meet more demanding consumption patterns, mainly in urban markets (Reardon et al., 2003). Nonetheless, in spite of growing interconnections between rural economies and urban markets, several market failures and asymmetries persist. These failures often lead to undesired environmental and social outcomes. Main environmental impacts relate to deforestation, soil erosion and water pollution, while social ones are the exclusion of traditional farmers from the value chains due to their more limited capacities to compete – in terms of costs and quality – in more demanding markets leading to unequal distribution of economic benefits from food markets (United Nations, 2014).

This section examines the main institutional initiatives aimed at building a more sustainable and inclusive food supply, with a focus on those driven by the private sector that is expanding its influence in the governance of value chains as part of new modes of governance that increasingly adopt the form of “hybrid” institutional arrangements in which state regulations and market-based mechanisms interact (Djama, 2011; Marsden et al., 2009). It includes an overview of the main challenges to achieve sustainability and inclusiveness in the global food systems, as well as the scale, scope and potential of different governance instruments that are in place. Some of the main global processes that are emerging in order to support sustainable supply are examined. An overview is included of corporate sector initiatives and commitments towards sustainable supply while reducing deforestation and protecting local people’s rights, including “hybrid” models where both the public and private sectors collaborate to build sustainable value chains.

6.3.2 The Challenges of Sustainability and Inclusiveness in Food Supply

Our analysis focuses on the mechanisms, initiatives and processes, located at different levels and driven by non-state actors that are aimed at promoting sustainable food supply. Particular emphasis is given to large-scale investors and

initiatives related to the corporate sector. Figure 6.2 shows the main mechanisms and processes in the institutional architecture that shape sustainable food supply, with a focus on agro-industrial value chains. This diagram is not exhaustive. It shows some of the main initiatives undertaken at the global level, supported by company associations such as codes of conduct, and multilateral organisations such as guidelines for responsible investment and land governance. It also refers to labelling and certification associated with specific production standards and third-party certification to promote the adoption by companies, on a voluntary basis, of standards for sustainable crop production, and other social safeguards. In addition, there are emerging corporate initiatives expressed in the form of commitments to adopt deforestation-free supply chains. Combinations of these different mechanisms with specific state public policy lead to so-called “hybrid mechanisms” which can take different forms in practice.

The most relevant instruments adopted to enhance private sector performance in food supply comprise responsible investment instruments, codes of conduct, sustainability standards, and certification and labelling (Candel, 2014). Some of these measures focus on finance and investments, while others concentrate on the production and trade realms (van Gelder and Kouwenhoven, 2011). Incentives for adoption are related to managing social risks by reducing civil society pressure and improving relations with communities, as well as reducing the implications that reputational risk can have on financial risks for company operations (Campbell, 2007). In other cases, adopting codes of conduct, sustainability standards and certification schemes may enable access to more discerning and specialised markets as well as optimising harvesting and production processes (Page, 2013). While these instruments provide little scope for public actors' participation in their design, the implementation phase provides more opportunities for achieving synergies and complementarities among different actors (Pacheco et al., 2011).

**Processing shea butter (*Vittelaria paradoxa*),
Labé, Guinea. Photo © Terry Sunderland**

6.3.3 Global Initiatives to Support Sustainable Finance and Supply

Different mechanisms and instruments have emerged in order to create the conditions and mechanisms for upstream producers and downstream processors to target markets which demand goods that are produced in sustainable ways. The most relevant initiatives are instruments promoting responsible finance and large-scale investment developed by multilateral organisations (e.g. the International Finance Corporation – IFC) and multi-stakeholder processes such as roundtables for certification and traceability of commodity supply. These instruments are explained in more detail below, with a particular focus on what are the distinctive features that make them innovative. While the levels of adoption of these instruments are limited, they tend to expand slowly over time.

Initiatives and processes to promote responsible finance

The most important and well-known collective responsibility investment policy is the Equator Principles (EP), which is a financial industry benchmark for determining, assessing and managing social and environmental risk in project financing (Equator Principles, 2014). By 2014, 80 financial institutions had adopted the EP (Equator Principles, 2014). Signatories of the EP commit to adhere to the environmental and social guidelines (Performance Standards) of the IFC when providing project finance or related advisory services for projects costing USD 10 million or more. The Performance Standards of the IFC address a wide range of social and environmental risks, such as protection of human rights, protection and conservation of biodiversity, use and management of dangerous substances, impacts on affected communities and indigenous peoples, labour rights, pollution prevention and waste minimisation. There is important variation in the way in which these principles are implemented. In practice, the IFC's actual policy prescriptions tend to vary, such as happened in the palm oil sector (van Gelder and Kouwenhoven, 2011). Nonetheless, knowledge of the deficiencies in following IFC standards led the World Bank to revisit its strategy for engagement in the palm oil sector in 2011 (World Bank, 2011).

Initiatives shaping large-scale investments

Large-scale foreign direct investments (FDI) in land acquisition have expanded in developing countries, mainly in sub-Saharan Africa, with negative impacts on local livelihoods (Cotula et al., 2011; Deininger, 2011). While these investments can contribute to economic development in hosting countries, they also take advantage of relatively favourable economic and regulatory conditions, thus mechanisms are needed in order to maximise their benefits while minimising their adverse social and environmental impacts (Haberli and Smith, 2014). Several international initiatives, including statements of principles and voluntary codes of conduct, have emerged in response to the need for transparency, sustainability, involvement of local stakeholders and recognition of their interests, emphasising concerns about deforestation, domestic food security and rural development (Hallam, 2011).

Among these initiatives the three most relevant ones are all led by international organisations. There is a first draft for negotiation of the World Committee on Food Security (CFS) associated with the "Principles for Responsible Agricultural Investment" (CFS-RAI Principles) (CFS, 2014). Two other initiatives include the FAO-led "Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security" endorsed by the CFS in 2012 (CFS-FAO, 2012), 2), and the OECD's "Guidelines for Multinational Enterprises" (OECD, 2008). In addition to those mentioned above, some human rights commitments have been

included in the voluntary guidelines on the right to food (FAO, 2004). These different principles and guidelines are all so-called soft law instruments and thus not legally binding. The first two address adverse effects associated with agri-FDI, while the others seek to prevent human rights violations by investors.

Certification schemes and voluntary sustainability standards

Voluntary sustainability standards provide assurance that a project, process or service conforms to a set of criteria defining good social and environmental practices. Specific schemes cover production (e.g. organic certification), the relations between chain actors (e.g. Fairtrade), and some cover both production and chain relations (e.g. the Forest Stewardship Council – FSC) (van Dam et al., 2008). In some cases, downstream supply chain actors (e.g. retailers, processors) impose standards on their suppliers as a way to inform consumers of their commitment to environmental and social objectives. In the case of Fairtrade, for example, buyers have sought collaborative business relationships with cooperatives in order to increase access to high-quality coffee (Raynolds, 2009). In other cases, upstream chain actors (e.g. cooperatives and privately-owned businesses) seek out certification on their own for the purposes of obtaining higher prices from the sale of their raw material. Non-governmental organisations (NGOs) and government agencies often support farmers in their efforts to obtain certification under the assumption that certification contributes to environmental and social goals. In some cases, certification can become a prerequisite for producers to access markets (Donovan, 2011). Box 6.3 examines a case of coffee certification in Nicaragua.

Box 6.3 Fairtrade coffee certification in Nicaragua

In Nicaragua, researchers have focused considerable energy on the issue of access to certified coffee markets and related implications for coffee supplies and rural development. In the late 1990s, governments and donors supported certification in Nicaragua in response to the dramatic and sustained reduction in price for coffee, with the expectation that access to markets for certified coffee would offer economic benefits over the short and long term (USAID, 2003; Varangis et al., 2003). Considerable investments were made by NGOs and donors to build local capacities for increasing coffee quality, obtaining certification and enhancing smallholder supply capacity. In many cases, cooperatives played a critical role in upgrading production capacities and in building relations with buyers and credit providers. However, in practice the results have been mixed. Arguments explaining these outcomes have centred on the persistence of low yields and relatively high labour requirements (Valkila, 2009; Barham et al., 2011; Beuchelt and Zeller, 2011), declining prices relative to conventional coffee (Weber, 2011) and the inability of smallholders to intensify coffee systems given their livelihood insecurities and rising production and household consumption costs (Mendez et al., 2010; Wilson, 2010; Donovan and Poole, 2014). There appears to be a growing consensus that smallholders in Nicaragua were probably too poor to be able to respond to the demands of buyers and certification systems.

An interesting case of voluntary sustainability standards is the so-called commodity roundtables, specifically the Roundtable for Sustainable Palm Oil (RSPO) and the Roundtable on Responsible Soy (RTRS), as mechanisms for certification of supply based on agreed sustainable production standards (Schouten and Glasbergen, 2011). These roundtables have been established to include different stakeholders along the value chain such as government, NGOs, industry, importers and exporters. The process has not been exempt from tensions, particularly in the context of building the legitimacy of the certification mechanism in the eyes of affected private sector actors, including industry and traders (WWF, 2010). In the case of RSPO, the adoption of sustainability standards by company members has been relatively slow, but it tends to expand over time. To date, 11.95 million tonnes of palm oil are certified, covering a total of 3.16 million hectares, and accounting for 18 percent of total global production (RSPO, 2014). Potts et al. (2014) provide a comprehensive review of the status and progress achieved by the implementation of a diverse set of voluntary sustainability standards – including FSC, RSPO, Fairtrade, Bonsucro, among several others.

6.3.4 Emerging Corporate Sustainability Initiatives

The corporate sector has a decisive role in shaping social and environmental outcomes associated with food supply in the context of current, globally-integrated food systems (Magdoff et al., 2000). Transnational corporations are central actors in the development of the global food system since they tend to dominate production and trade, and constitute important players in the processing, distribution and retail sectors (Clapp and Fuchs, 2009). Financial institutions and investors are also key actors in the food value chains. The most significant initiatives involving these actors are revised below.

Efforts towards the adoption of responsible financial investments

The adoption of policies and practices for due diligence, mandated and voluntary environmental and social risk management, and preferential green investments, such as those developed by IFC and a few commercial banks all contribute to the adoption of responsible finance. Responsible investment policies need to contain well-defined, verifiable criteria – preferably derived from internationally-recognised standards – that the financial institution can use to evaluate the proposed investment. Many financial institutions have set up their own benchmarks that meet these criteria, but there are also collective responsible investment policies undersigned by a group of financial institutions. Over the past ten years, more and more financial institutions have developed their own responsible investment policies for various sectors and sustainability issues (Perez, 2007). Leading this development was the World Bank Group. Its private-sector subsidiary, the IFC, has over two decades of experience with assessing investment proposals against its Performance Standards on Environmental and Social Sustainability, which define criteria on a broad range of social and

environmental issues (IFC, 2012). Some public banks have followed this trend such as the Brazilian Development Bank (BNDES) that has also adopted similar guidelines (BNDES, 2014).

As the issues and sectors for which banks have developed policies or benchmarks vary, the number of banks that have developed benchmarks relevant to the agricultural sector is relatively more limited. A BankTrack study comprising 49 large international banks indicated that 16 institutions had developed a forestry policy and nine had developed an agricultural policy (van Gelder et al., 2010). This suggests that there is scope for adoption of policies by financial institutions that can lead to more responsible investments.

Voluntary commitments by the corporate sector for sustainable supply

Many corporate groups involved in supply, processing and retailing are adopting commitments, some with well-defined targets, for achieving their projected production goals with lower negative social and environmental impacts. On the supply side, these are made by corporate groups developing their operations in landscapes where there is a high risk of environmental impacts (e.g. peatlands in Indonesia, tropical forests in Brazil). On the demand side, these commitments are made by consumer goods companies that are well positioned in the markets responding to social pressure on corporate social and environmental performance (Baron et al., 2009). For example, the Consumer Goods Forum (CGF) has adopted a “Global Social Compliance Programme” aimed at improving social and environmental sustainability in the supply chains by harmonising existing efforts (GSCP, 2014).

Specifically, Wilmar International Ltd., the largest palm-oil trader, committed in late 2013 to ensure that its plantations and suppliers protect certain forests and abstain from using fire to clear land, and also banned development on high-carbon-stock landscapes including peatlands (Wilmar International, 2014). Unilever, the second-largest manufacturer of consumer goods, also committed in late 2013 to purchasing all palm oil from sustainable sources by 2015, and that all palm oil would be certified and come from traceable sources by 2020 (Unilever, 2014). Some end-user companies of palm oil, notably Starbucks agreed in early 2013 to source 100 percent of their palm oil from certified sustainable suppliers by 2015, which was a response to a shareholder resolution filed by an environmental mutual fund (Starbucks, 2014). Additional commitments to source sustainable palm oil have been made by some other consumer goods companies such as McDonalds, Walmart and Nestlé.

On the supply and processing side, in part as a result of the commitments made by consumer goods companies, five of the world’s largest palm oil companies (Asian Agri, IOI Corporation Berhad, Kuala Lumpur Kepong Berhad, Musim Mas Group and Sime Darby Plantation) together with Cargill, subscribed to the “Oil Palm Manifesto” in July 2014 (HCSS, 2014). This manifesto aims to achieve three specific objectives: 1) build traceable and transparent supply chains, 2) implement the conservation of high carbon stock (HCS) forests and the protection of peat areas regardless of depth, and 3)

Washing vegetables in the river in Ouagadougou, Burkina Faso. Photo © Terry Sunderland

increase benefit sharing while ensuring a positive social impact on people and communities. Furthermore, in September 2014, three companies (Cargill, Golden Agri-Resources GAR and Wilmar) subscribed to the “Indonesian Palm Oil Pledge” known also as the KADIN pledge. These companies commit to achieving the following: 1) adopt and promote sustainable production practices based on acceptable methods of classifying HCS forests, and sustainable supply chain management and processing, 2) work with the

Indonesian Chamber of Commerce (KADIN) to engage the Government of Indonesia to encourage development of policy frameworks that promote the implementation of the pledge, 3) expand the social benefits from palm oil production, and 4) improve the competitiveness of Indonesian palm oil.

During the UN Climate Summit in New York City, held in September 2014, about 150 different governments, businesses and NGOs joined forces to announce “The New York Declaration on Forests” under which these different groups committed to cutting forest loss in half by 2020, and ending it by 2030. This declaration also calls for eliminating forest loss from agricultural commodity supply chains by 2020 and restoring at least 350 million hectares of degraded forestlands by 2030. This declaration was signed by some of the major players of the palm oil industry, including palm oil traders (APP, Cargill, GAR and Wilmar) and consumer companies (Kellogg’s, General Mills, Nestlé and Unilever), which complements their no-deforestation commitments for palm oil sourcing.

6.3.5 “Hybrid” Models for Sustainable and Inclusive Supply

Several initiatives have emerged in both consumer and producer countries to promote trade of commodities in national and international markets that originate from more sustainable sources, or that place reduced impacts on local people, which somehow adopt the form of “hybrid” models since they tend to articulate public regulations with private standards in different ways. Two such experiences are described here. While these experiences are still in their infancy, they may have potential to develop into more consolidated initiatives that could lead to improved outcomes in both inclusiveness and sustainability, which continues to be an elusive goal in many cases.

Linking international standards and national regulations

In Indonesia, a mandatory government-led standard, labelled “Indonesian Sustainable Palm Oil” (ISPO) has been issued for the production of palm oil in addition to the RSPO, a relatively consolidated voluntary, market-based certification system (described above). The main rationale for setting up the ISPO is that only large-scale palm oil companies are members of RSPO, whereas medium-scale companies account for a large share of the palm oil sector (Indonesia Ministry of Agriculture, 2012). Furthermore, only a small portion of certified palm oil suppliers have established markets in developed countries, which tend to demand sustainably-produced palm oil, while a significant portion of demand lies in less demanding markets, such as China and India that received 38 percent of total crude palm oil exports in 2013. When including other developing countries this segment of the market makes up 70 percent of the total (COMTRADE, 2014). The Indonesian government has acted carefully with regard to the RSPO (Rayda, 2012), and after initially joining the organisation, the Indonesian Palm Oil Association (GAPKI) withdrew its membership in 2011, stating its intention to fully support the recently announced ISPO. The latter is conceived as a way to improve the adoption of standards in palm oil in Indonesia by complying with existing regulations, which have been hard to enforce. This may lead to reducing existing gaps in the adoption of good practices in palm oil production.

Linking sustainable value chains to jurisdictional approaches

The “Green Municipalities” is an initiative emerging in the state of Pará in the Brazilian Amazon, associated with public-private arrangements to improve sustainable supply and enhance landscape management, particularly in the cattle beef value chains. This initiative has developed as part of a broader, relatively complex, institutional arrangement involving the public sector to halt deforestation and promote forest regeneration. The arrangements are enforced by the federal government with the assistance of environmental agencies (IBAMA) and contributions of municipal governments. In addition, banks have been mandated by state regulations to limit commercial loans to farmers that are not able to comply with environmental regulations, and to voluntarily subscribe to a Rural Environmental Cadastre (Whately and Campanili, 2014). This institutional scheme now plays a crucial role in voluntary actions from supermarkets that are mainly located in the highly populated urban centres of southern Brazil, which have thus banned beef originating from illegally deforested lands in the Amazon (Pacheco and Pocard-Chapuis, 2012). Furthermore, as a response to changes in demand, farmers have engaged in improving practices of herd and pasture management by implementing standards developed by the state research agency (EMBRAPA) as a way to intensify cattle production and reduce pressures on conversion of forests. However, these practices are mainly adopted by medium- and large-scale cattle beef systems, while smallholders with more diversified farming systems face the risk of being left behind with limited options.

Table 6.1 Instruments with potential to contribute to sustainable commodity supply.
Adapted from Pacheco et al. (2011).

Instrument	Market Mechanism	Influence on	Incentive	Stakeholders	Role of actors in instrument design and/or implementation	
					Public	Private
Responsible investment instruments	Anticipated benefits associated with a good corporate image encourages financiers to invest only in those corporate actors whose practices are considered sustainable or low-risk	Finance and investments	<ul style="list-style-type: none"> - Reduced civil society pressure - Reduced risk of investments - Improved public image 	<ul style="list-style-type: none"> - Financiers (design and application of instrument) - Corporate actors (complying with criteria so as to access finance) - Civil society (lobbying for responsible investment practices) 	- None	<ul style="list-style-type: none"> - Establishing criteria - Application of instrument - Verification of compliance - Implementation of actions to meet criteria
Criteria self-developed by corporations/ codes of conduct	Anticipated benefits associated with a good corporate image encourages practices deemed to be environmentally and/or socially beneficial or benign by key stakeholders	Production and processing	<ul style="list-style-type: none"> - Improved relations with local communities - Reduced civil society pressure - Reduced risk to operations - Marketing tool 	<ul style="list-style-type: none"> - Affected communities - Civil society in developed and developing countries - Government in developing countries - Shareholders 	- None	<ul style="list-style-type: none"> - Establishing and implementing policies - Voluntary reporting to shareholders
Sustainability standards	Anticipated benefits associated with a good corporate image encourages portfolio of land uses to shift to align with standards	Mostly production	<ul style="list-style-type: none"> - Access to certain markets - Optimisation of production processes 	<ul style="list-style-type: none"> - All actors along the supply chain 	- Definition of standards	<ul style="list-style-type: none"> - Negotiating standards - Sometimes driven by actors further downstream
Certification and labelling	Strict standards for accessing benefits encourages portfolio of land uses to shift to provide uses or services required by the instrument	Production and markets	<ul style="list-style-type: none"> - Access to niche markets - Price premium 	<ul style="list-style-type: none"> - All actors along the supply chain - Consumers 	- Identification of effective criteria - Setting targets	- Independent verification

6.4 Socio-cultural Response Options

6.4.1 Introduction

Social and socio-cultural response options to enhance food security by influencing forest and tree-based systems are manifold. Addressing social drivers requires a more nuanced approach as these drivers are strongly influenced by cultural differences and, due to their frequently informal nature, are not always easy to grasp, to categorise and to quantify. Macro-scale responses addressed in this section encompass opportunities and challenges of changing urban demand, nutrition education and behavioural changes, reducing inequalities and promoting gender-responsive interventions and policies, as well as social mobilisation for sustainable food security.

A homestead lunch, Cat Ba, Vietnam.
Everything on the table is sourced from the
forest, farm or nearby water courses.
Photo © Terry Sunderland

6.4.2 Changing Urban Demand

Cities are centres of creativity, power and wealth. Understanding the dynamics, growth and organisation of cities, using a sustainability lens, is important for food security and environmental sustainability (Bettencourt, 2013; Bettencourt et al., 2007). With more than half of the world's population currently living in cities with a continued rise predicted, securing adequate food supply for city dwellers will be even more crucial than it is today. Growing urbanisation often calls for increased food production in surrounding rural areas, but also raises pressures to convert agricultural land in the wake of urban development. In order to address the complexity of divergent priorities, there is a need for planning alternatives, policies and incentives that aim to reconcile growth, management, food security and sustainable diets, and the enhancement of agriculture (Forster and Escudero, 2014).

Urban consumers are increasingly aware of the fact that modern agriculture can have negative environmental externalities, for example through the use of agricultural biocides and synthetic fertilisers and the concentration on few crop varieties (Badgley and Perfecto, 2007). These have led to eutrophication of aquifers, soil degradation, loss of biodiversity or reduction of genetic diversity, among others, and highlight the need for more sustainable agricultural methods for food production. However, knowledge gaps regarding trade-offs arising from competing economic and environmental

goals, and key biological, biogeochemical and ecological processes involved in more sustainable food production systems remain (Tilman et al., 2002).

These negative environmental externalities have prompted environmentalists and others to support more sustainable methods of food production and to advocate for a shift in dietary choices (Halberg et al., 2005). In Western countries, advocacy for organic agriculture and vegetarianism are two of the most prominent responses to such criticism.

Organic agriculture has gained recognition as having an important potential to help feed the world and restore biodiversity and landscape richness at the same time (Badgley and Perfecto, 2007; Fuller et al., 2005). Health, ecology, care and fairness principles form the core of the organic agriculture vision, all working towards supporting the health and integrity of ecological systems and cycles in a sustainable manner (IFOAM, 2005). Similarly, urban (relatively wealthy) consumers actively seek and pay more for food labelled or certified as “environmentally-friendly” or “pesticide free”, characteristics that attract them to organic foods (Dimitri and Greene, 2002). Today, organic farming is practised in 162 countries, and organic food and drink sales worldwide reached almost USD 63 billion in 2011 (Soil Association, 2014). This has been achieved through a change in perceptions of natural food from being a prerogative for alternative lifestyles to what is consensually understood as being healthy. Whereas in 1997 organically produced food was primarily sold in natural food stores, almost half of it was purchased in chain supermarkets in 2008. At the same time, the number of farmers’ markets, where organic farmers sell their products directly to end-users quadrupled from less than 2,000 in 1994 to more than 8,000 in 2013 (Alkon, 2014).

The second shift in urban demand that we address here concerns meat-free food choices. While full or partial vegetarianism is part of the history and culture of many people in the world, most vegetarians in Western societies are not life-long practitioners but converts (Beardsworth and Keil, 1992). European and North American campaigns promoting a shift from meat consumption to vegetarian diets are nowadays often associated with a desire to reduce the ecological footprint of food production. For example, feed grains given to animals for human consumption in urban areas contribute largely to the overall urban footprint, and the corresponding intensive livestock systems are often blamed for forest loss, reduced water quality and diseases (Forster and Escudero, 2014). Furthermore, through feed, enteric fermentation manure management and post-production processes, livestock production is among the largest emitters of greenhouse gases in agriculture (Smith et al., 2014). Modelling results suggest that dietary shifts to lower meat consumption and a healthy diet could result in agricultural emission reductions of 34 to 64 percent by 2050 (Stehfest et al., 2009).

Both vegetarianism and organic food production are conducive to improving the livelihoods of rural populations. Many of the products that can supplement basic staple foods and substitute meat are grown on trees (Jamnadass et al., 2013)

providing significant opportunities for *agroforestry* systems if appropriate value chains are established (see Section 6.3). The lower demand for land to feed livestock can also contribute to reduced deforestation (Smith et al., 2014). However, in spite of an increase in vegetarianism and the perception that sustainable forms of agricultural production are needed, and despite widespread knowledge of the adverse effects of excessive meat consumption (Bender, 1992), meat, dairy and poultry consumption continues to rise with growing affluence (Alexandratos and Bruinsma, 2012), in turn aggravating the environmental impacts associated with livestock production (Westhoek et al., 2014). Asia, in particular, is among the regions with the highest increase in meat consumption and requires heavy investments in education to change behaviours and improve dietary choices.

6.4.3 Behaviour Change and Education to Improve Dietary Choices

Dietary choices depend on access, availability and affordability (Dibsdall et al., 2002) but also socio-cultural and environmental factors (Sobal et al., 2014; Kuhnlein and Receveur, 1996; Fischler, 1988). Even small changes in access or prices can have significant impacts on diets (Glanz et al., 2005; Story et al., 2008). While reformed political and market frameworks can enhance access to food and stabilise its prices, *malnutrition* also needs to be addressed on an interpersonal level. Better knowledge about healthy diets through nutrition education can therefore play an important role (FAO, 1997; Jamnadass et al., 2011). A revalorisation of knowledge on the origins and properties of food items and effects of these food items on human health can potentially lead to increased interest in *traditional ecological knowledge* about forest and tree foods. Such interest can be an important counter-movement to the rapidly progressing loss of traditional and indigenous knowledge, widely attributed to social change and modernisation (Keller et al., 2006; Lykke et al., 2002; Ogoye-Ndegwa and Aagaard-Hansen, 2003; also see Chapter 3).

Nutrition and health education in its broadest sense has three components: providing information through communication strategies (e.g. information campaigns, dietary advice in health service settings), providing skills that enable consumers to act on the information provided (e.g. meat preparation, food preservation) and providing an enabling food environment (e.g. marketing to children, making different foods available) (Hawkes, 2013). Nutrition and health education can translate greater food availability at the household level into healthier diets by targeting women, men and children in the households with tailored messages about improved food choices (McCullough et al., 2004), for example, through optimal feeding and care practices for infants, young children and women of reproductive age. In terms of *agroforestry* and food security, there is, for example, a need to understand how best to educate consumers on the benefits of eating fruits, many of which are tree products (Jamnadass et al., 2013).

There are numerous examples documenting successful nutrition education campaigns. A particular nutrition education programme in Thailand's Kanchanaburi

Province, for instance, considers children as effective agents of change in societies and therefore, teaching them about agriculture and nutrition is seen to be a wise investment (Jamnadass et al., 2011; Sherman, 2003). In this example, education for sustainable development involved teaching school children how to sustainably harvest forest foods, how to plant, cultivate and harvest their local traditional agricultural crops in village areas, and prepare healthy meals for their families. By targeting children from a young age, foundations for behavioural changes in entire communities are laid (Burlingame and Dernini, 2012). Numerous forest conservation programmes also attempt to introduce agroforestry practices and integrate dietary concerns in their environmental conservation efforts. In the Kenyan Mau Forest, for instance, a number of conservation projects promote the establishment of school gardens, planting of fruit trees and integrated agroforestry practices alongside conventional tree planting drives (NECOFA, 2013). Nutrition education has also gained momentum in education systems of developed countries, mainly through practical application of knowledge in school gardens, cooking classes and sometimes specialised students' clubs (Alkon, 2014). In the USA and other developed countries, apart from rising awareness of malnutrition and hunger, nutrition education is popularly used to fight against obesity – hunger and obesity being two sides of the same coin (Patel and McMichael, 2009; Zerbe, 2010).

Despite important positive contributions, the effectiveness of education-based initiatives for sustainability and food security needs to be further explored to ensure that benefits have long-term impacts and do not promote solutions that have negative side effects such as nutritional imbalances or unsustainable practices.

6.4.4 Reducing Inequalities and Promoting Gender-responsive Interventions and Policies

There is evidence around the world that greater involvement of women in forest management improves the condition and sustainability of forests (GEF, 2015). This may be because women are responsible for a majority of household chores that are related to forest products, especially firewood collection, and women are thus more aware of the effects of deteriorating forest conditions. Consequently, many women engage in conservation of forest resources or in environmentally-friendly practices in order to avoid or mitigate future hardship (Agarwal, 1997; Acharya and Gentle, 2006). Studies show, for instance, that in parts of Asia where rural migration to urban centres is widespread, women tend to plant more trees on their lands than men as the intensity of agricultural management declines in response to rising incomes through remittances (Agrawal et al., 2013). In other places, the supposed positive influence of women on the landscape is further encouraged by targeted legislation and programmes, with vast effects at the local level. For example, with support of the Forest Department of India, village forest committees (VFCs) were formed to ensure equal participation of men and women in forest activities. The deliberate inclusion of

women in the VFCs provided incentives for women to manage, protect and conserve their forests sustainably (WWF, 2012).

However, women's productive potential in natural resource management is often constrained by socio-cultural factors, particularly in rural areas in developing countries. Often, women's participation in natural resource management is also

Woman pounding cassava for fufu, Senegal. Photo © Terry Sunderland

restricted by land ownership and land tenure rights and agreements, as well as distribution of decision-making powers that favour men (see Chapter 3). As a result of complicated tenure arrangements, women often have to negotiate for rights to land and associated resources. In some areas, women thus engage in collective action to influence such decisions, for example by entering sharecropping arrangements, buying or accessing land collectively, often with the help of NGOs (FAO, 2002; Agarwal, 2009). Many of these NGOs use multilevel approaches by, for instance, including training of leadership with best practice training in technology and innovation that are tailored to women's tasks and needs (USDS, 2011). The potential impact of more efficient land use by women is

especially interesting due to the fact that subsistence crops are often "women crops", under the primary responsibility of women (Das and Laub, 2005). Taking climate change into account, the frequent exclusion of women from technology and adaptive innovation is particularly counter-productive (Terry, 2009). Access and better use of land are particularly important in light of study results that show that food security might still be compromised even in food secure households, often to the disadvantage of women and children (Hughes, 2010). Women are often more inclined to reduce the number of meals they take in a day or the quantity and/or quality of food per meal for the benefit of other household members, thereby exposing themselves to enormous health risk (Nelson and Stathers, 2009). Altogether, if women had the same access to productive resources as men, the FAO estimates that women could increase the yields on their farms by 20-30 percent, leading to a total increase of agricultural output of 2.5 percent in developing countries and thus reducing the number of hungry people by 12-17 percent (FAO, 2011).

While this outlook is promising, increasing women's contribution to enhanced food security and nutrition at large scale will require a clear commitment for further inclusion of women in decision-making processes concerning land use and land use planning. Although national legislation granting equal access to productive resources is essential for social equity, socio-cultural attitudes and practices that have evolved over decades and centuries are not easily changed and often resist adaptation to new laws and transformation altogether. This is particularly true in rural areas where local norms are often enforced by older and respected, and thus more powerful (frequently male) community members (FAO, 2002). Because saliency, legitimacy and relevance of more equitable laws and resource management rules are critical for community buy-in and effective implementation, some organisations implement participatory awareness campaigns, characterised by local community involvement in design and implementation (Clark et al., 2011). Communication approaches that widely disseminate information and education campaigns can also help. At the same time, an in-depth understanding is needed of the complex relationships between on the one hand, land tenure, use and control and on the other, their influence on food security, forests and tree-based systems, in order to promote gender inclusiveness in decision-making and sustainable benefit sharing. Such an understanding is also a prerequisite to external contribution to more inclusive land tenure policy frameworks (see Section 6.2).

6.4.5 Social Mobilisation for Food Security

Social mobilisation seeks to foster change through awareness creation by engaging a wide range of actors in interrelated and complementary efforts (UNICEF, 2015; FAO, 2003). Engagement processes (historically face-to-face) allow stakeholders to reflect on and understand their situation, organise themselves and initiate action. Traditionally, social mobilisation is an endogenous process through which like-minded persons attempt to exchange ideas, define common purpose and strengthen their voices in order to be heard by their fellow citizens and authorities alike. In addition, social mobilisation has also been used as a tool to increase legitimacy and sustainability of externally encouraged activities in the context of community development.

In the USA and Western Europe popular interest in food and agriculture has skyrocketed in recent years and with it a multiplicity of social "food movements". Some even speak of a "food revolution" (Nestle, 2009). Most of these movements critically assess modern food production technology and the entire heavily subsidised, chemically intensive and cheap labour dependent, industrial, corporate food system. Many movements advocate for and promote more humane and environmentally friendly ways of producing, selling and consuming. The massive disposing of unwanted or wasted food is yet another facet of the same problem (Zerbe, 2010). The FAO's 2013 "Food Wastage Footprint" report for instance specifies that 1.3 billion tonnes of edible food parts from 1.4 billion hectares of land (28 percent of the world's

agricultural area) are wasted, leading to a direct economic loss of an estimated USD 750 billion per year (FAO, 2013b). In the same vein, since the inclusion of almost all agricultural products in trade liberalisation in 1994, under the auspices of the World Trade Organization (WTO), developing countries have been further encouraged to reorient their economies towards export to the North and to neglect the production of food for the domestic market. Also, a lack of democracy in basic political institutions has favoured corporate interests of the food industry (Marshall, 2013). This critique has largely informed the Right to Food, food justice and *food sovereignty* movements (Hughes 2010), which have their root in the fair trade movement (Zerbe, 2010). Globally, the perhaps largest social mobilisation concerning food security and environmental sustainability concerns the regulation and restriction of genetically modified foods. While a majority of the main food crops in the US continue to be genetically modified, activists' mobilisation has been very successful in Europe (Alkon, 2014).

Due to its decentralised, often community-centred and sometimes sporadic nature, a characterisation of contemporary food movements is difficult. For the United States, Nestle suggests a separation between movements that address the production side (such as the Slow Food, the farm-animal welfare, the organic foods, or the locally grown food movements) and those that address the consumption side (anti-marketing-foods-to-kids, school food, anti-trans-fat, or the calorie labelling movement), while others unite both purposes (community food security, better farm bill movement) (Nestle, 2009).

Social mobilisation for environmental sustainability and food security is also witnessed in the developing world. For example, the tree planting programmes of the Green Belt Movement (GBM) provide incentives for Kenyans to successfully improve their environments, doubling as a sustainable land management approach with a reliable source of income for women (Shaw, 2011). By early 2015, the GBM published figures indicating that it had planted over 51 million trees in Kenya through its extensive network of over 50,000 female members. Using a multidisciplinary approach, the GBM integrates the promotion of environmental conservation, with women's and girls' empowerment, and a focus on democracy and sustainable livelihoods (GBM, 2015). Starting as a small, local project, promoting gender inclusiveness and conservation, the GBM has become a nationally recognised and internationally acclaimed movement. Its founder, the late Wangari Maathai, received the Nobel Peace Prize in 2004 for her extraordinary contribution to awareness creation, environmental conservation and social transformation.

Another interesting example is the food sovereignty movement "La Via Campesina" (the Peasant Way), an international organisation and platform that assembles peasant farmers, small-scale farmers and activist groups from 73 countries in Africa, Asia, Europe and the Americas. In existence since 1993, La Via Campesina has gained international recognition as a main actor in food and agricultural debates and is heard by institutions such as the FAO and the UN Human Rights Council (Hughes, 2010; La Via Campesina, 2011).

Social mobilisation is also a common tool in rural development and poverty alleviation programmes to strengthen participation of the rural poor in local decision-making. According to UN-HABITAT, communities and stakeholders that take ownership of their own problems, such as conflicts and environmental degradation, take better informed decisions, are able to reach more sustainable solutions and achieve results faster, while fostering their solidarity and capacity to undertake development initiatives (UN-HABITAT, 2014). Collective action has been successful in many regards, for example improved access to social and production services, greater efficiency in the use of locally-available resources, and enhanced asset building by the poorest of the poor (FAO, 2003; NRSP, 2005).

Garlic sellers, Kouana village, Guinea. Photo © Terry Sunderland

There are various examples in the world where social mobilisation has worked in favour of food security and forest conservation. For example, through a UNDP initiative in Tajikistan on agroforestry, communities around the Gissar Mountains were mobilised to plant salt-tolerant trees and other grafted new tree species to alleviate the impacts of overutilisation and degradation of natural resources, civil war and consequent socio-economic hardships. As a result, pressure on forest resources was reduced and household incomes increased, from the trees themselves, as well as from the establishment of tree nurseries. Local farmers also experimented further, using grafting technology to cultivate fruit trees (UNDP, 2015).

Urban dynamics, behavioural change, tackling inequalities and social mobilisation all represent different options to address the drivers that affect forests and tree-based systems, and thus their impacts on food security and nutrition.

6.5 Conclusions

This chapter looked at options to improve food security and nutrition in forests and tree-based systems through governance and policies at national scales, market-based approaches and socio-cultural responses. Based on examples from numerous developing but also developed countries we have shown how changes in policies, corporate strategies, social norms and values, and technical developments can positively influence outcomes in livelihoods and human wellbeing in forest contexts.

The section on governance innovations to better link forests with food security discussed lessons from tenure reform, decentralisation of authority, market regulation and access to knowledge and technology. A central governance issue is how and to what extent policy and regulatory frameworks help ensure equitable access of the poor, women and disadvantaged groups to forests and tree-based systems, and to what extent these regulatory arrangements recognise the rights to direct and indirect benefits for food and nutritional security. On the process side of governance reform it is important to include relevant actors, from local communities to government departments, whereas on the substantive side, tenure security, decentralisation of decision-making and strengthening institutional capacity at local levels have shown to be effective.

The section on private sector-driven reform emphasised initiatives aimed at enhancing the governance of large-scale investors supporting sustainable practices in the commodity value chain, improved benefit sharing and protection of local people's rights. In most cases, these initiatives interact with the public sector and complement policy frameworks. While guidelines and principles to regulate large-scale investments are becoming increasingly important, it is unclear if they will change corporate behaviour toward greater sustainability. Sustainability standards supported by multi-stakeholder processes may therefore foster greater changes on the ground but their adoption is still limited and smallholders not able to comply with more complex terms and conditions may be excluded. The more recent commitments and pledges by corporate actors to zero deforestation and sustainable supply, as well as improving benefits for local people, may therefore have significant influence in shaping future production practices and business models. To achieve more inclusive food systems that not only use appropriate innovations but also value local practices, management systems and knowledge, it may be necessary to promote more structural reform, involving greater intervention from the state to harmonise regulatory regimes. Co-regulatory approaches that involve both public and private sector actors may in the future enhance the governance of food systems.

The section on socio-cultural responses focused on examples from gender research, behavioural change, social mobilisation and urban dynamics to illustrate the importance of education, communication and access to information in achieving better food security and nutrition outcomes while preserving and improving forests and other land-based natural resources. Education plays an important role

in empowering rural populations and has the potential to generate tangible and fundamental benefits for households and communities in achieving food security and nutrition, sustainable forest and landscape management, and health. For women and other vulnerable groups appropriate education and training programmes can improve the understanding of healthy and nutritious foods and natural resource management practices, and support traditional rural societies in understanding and incorporating necessary changes that enable gender inclusiveness in decision-making and benefit sharing in forests and tree-based systems. Behavioural change to encourage foods and diets with better environmental footprints, such as low meat consumption diets and an increased use of organically produced foods, can have significant positive impacts on rural populations if the value chains necessary to meet the demand are set up to include smallholders and marginalised groups.

Overall, these public and private sector reforms and social changes achieve greatest impact when they go hand in hand. Whether or not innovation, reform and change at the levels discussed in this chapter are sufficient to transform food systems toward long-term sustainability and food security and nutrition in forests and tree-based landscapes requires continued scrutiny and assessment.

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