



Food and Agriculture  
Organization of the  
United Nations



# STRENGTHENING SECTOR POLICIES FOR BETTER FOOD SECURITY AND NUTRITION RESULTS

## Forestry

POLICY GUIDANCE NOTE | 3



These policy guidance notes have been produced in the frame of the strategic partnership between the Food and Agriculture Organization of the United Nations (FAO) and the Directorate for International Cooperation and Development of the European Commission to boost food and nutrition security, sustainable agriculture and resilience.

The forestry guidance note was written by Sooyeon Laura Jin and Dominique Reeb, with contributions from Eva Muller, Dominic Rowland, Andrea Perlis, Hajnalka Petrics, Esther Wieggers and Mark McGuire of FAO.

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of FAO concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views of the Food and Agriculture Organization of the United Nations, or can in no way reflect the views of the European Union.

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be made via [www.fao.org/contact-us/licence-request](http://www.fao.org/contact-us/licence-request) or addressed to [copyright@fao.org](mailto:copyright@fao.org).

FAO information products are available on the FAO website ([www.fao.org/publications](http://www.fao.org/publications)) and can be purchased through [publications-sales@fao.org](mailto:publications-sales@fao.org).

©FAO, 2017





# STRENGTHENING SECTOR POLICIES FOR BETTER FOOD SECURITY AND NUTRITION RESULTS

This policy guidance note is part of a series that the Food and Agriculture Organization of the United Nations (FAO), the Directorate for International Cooperation and Development (DEVCO) of the European Commission and partners are producing to support policy makers address the food security and nutrition situation in their country. Each note provides guidance on how to sharpen the focus of sector policies in order to achieve sustainable food security and nutrition outcomes.

# Contents

<b>Introduction</b>	<b>1</b>
Purpose of this guidance note	2
<b>Background</b>	<b>4</b>
Forests' contributions to food security and nutrition	4
Challenges to ensuring the contribution of forests to food security and nutrition	7
<b>Stepwise approach</b>	
<b>Addressing food security and nutrition in the forest sector</b>	<b>10</b>
<b>Step 1.</b> Conducting a stakeholder and situational analysis	10
<b>Step 2.</b> Mapping and analysing the policy landscape	13
<b>Step 3.</b> Formulating recommendations	15
<b>Step 4.</b> Adopting and implementing recommendations	18
<b>Concluding remarks</b>	<b>21</b>
<b>References</b>	<b>22</b>

# Introduction

This guidance note provides background information on forestry, food security and nutrition linkages and addresses the overarching question of what changes are needed to the existing forestry policy agenda<sup>1</sup> in order to give greater attention to food security and nutrition concerns. This note is primarily focusing on the forestry sector-led changes that are required for improved food security and nutrition. However, it should be noted that in order to bring meaningful changes in generating greater food security and nutrition impact, although not concretely addressed in this note, similar efforts are also required to place an increased importance of forestry issues in the food security and nutrition policy agenda, as well as in other policies of related sectors.

It is estimated that over 2.4 billion people worldwide depend on forest goods and services for the direct provision of food, woodfuel, building materials, medicines, employment and income. Forests contribute to the four dimensions of food security – availability, access, utilization and stability – and nutrition in many ways. Forest foods are a regular part of rural diets and serve as safety nets in periods of food scarcity. Wild foods from forests provide nutritious food to millions of rural women, men and children. Wild animals and edible insects from forests are often the main source of protein for the rural population. Forests generate income for local people and provide essential ecosystem services that support agriculture by regulating water flows, stabilizing soils, maintaining soil fertility, regulating the climate and providing habitat for wild pollinators and predators of agricultural pests.

<sup>1</sup> While this material can be applied to a wider context, its primary scope for application is at the national level.

## → Key facts

- Forests occupy one-third of the earth's land area. It is estimated that nearly one-third of the global population depends on forest goods and services to provide food, woodfuel, building materials, medicines, employment and income.
- Cooking is a primary means to ensure proper nutrient absorption, and globally 2.4 billion people make use of woodfuel for cooking and for sterilizing water.
- Forest's role in the maintenance of biodiversity as a "gene pool" for food crops helps to secure the diversity needed to promote adequate quality of diets.
- Wild foods from forests provide nutritious food to millions of rural women, men and children. Wild animals and edible insects from forests are often the main source of protein for rural populations.
- Some countries have shown that increasing forest cover while achieving food security and nutrition is possible by putting simultaneously in place sound food security and forest policies. In most of these countries, the food security and forest policies were also part of an overall enabling policy environment that led to economic development and diversification that contributed to less pressure on natural resources.

## → Key messages

Cross-sectoral forestry and food security and nutrition policies are essential to unlock the full potential of the contribution of forests to improved food security and nutrition.

- Integrated landscape planning through coordination across multiple sectors and stakeholders is needed to support cross-sectoral forestry and food security and nutrition policies.
- Keeping healthy forests is essential to provide the sustainable ecosystem services that are required for food security and nutrition.
- Improved land governance combined with institutional and tenure reforms as well as political will are necessary to reduce the current rate of forest degradation and increase the contribution of forest resources to food security and nutrition.
- Forest policies need to ensure that food security and nutrition objectives are integrated into forest management practices.
- Secure forest tenure, community-based forestry, agroforestry, adapted forest management practices, small and medium-sized enterprises and capacity development are some of the measures that can significantly enhance the contribution of forests to food security and nutrition.

The links between forests and food security and nutrition are not well understood and have often been neglected in forest policy as well as food security and nutrition policies and other related policies such as agricultural policies. The concept of sustainable forest management – increasingly the foundation of countries' forest policies and legal frameworks – emphasizes a balance among the economic, social and environmental aspects of forestry. This would imply that attention must be paid to the impact of forest management decisions and forest conversion to other land-uses on food security, nutrition and people's livelihoods (and vice versa: the impact of food security policies on forests). Yet both forest, and food security and nutrition often fail to offer support for sustaining and investing in forests to provide socio-economic benefits for their myriad users, especially when alternative land uses promise higher short-term or more visible and direct economic returns (FAO, 2013).

### Purpose of this guidance note

This guidance note aims to assist policy-makers and stakeholders contributing to policy-making related to forests, in sharpening the focus of national forest policies, legal and institutional frameworks (Box 1) for improved food security and nutrition outcomes. It provides background information and a set of key questions to help stakeholders in the forestry sector to identify conflicts and trade-offs, and synergies and win-win opportunities between the objectives of sustainable forest management and food security and nutrition. Ultimately, this note aims to help stakeholders during forestry and food security and nutrition policy-making processes by leading them to implement changes needed to existing forestry policy agenda to give greater attention to food security and nutrition.

The guidance note adopts a four-step approach to addressing food security and nutrition in the forestry sector.



Box 1

**Definition of forest policy, forestry law and institutional frameworks governing the forest sector**

- Forest policy is a set of orientations and principles of action, adopted by public authorities that are in harmony with national socio-economic and environmental policies in a given country to guide future decisions in relation to the management, use and conservation of forest and tree resources for the benefit of society.
- Forestry (act or code) law is a set of rules enacted by the legislative authority of a country regulating the access, management, conservation and use of forest resources.
- Institutional framework should be viewed not simply in terms of government departments and administrative structures but as an integrated system (e.g., structure and staffing of institutions responsible for Sustainable Forest Management (SFM), number of professional and technical personnel, capacity development, research and extension related to SFM, framework to work with local communities, civil society organizations, and responsible private-sector interests).

Source: Global Forest Resources Assessment, FAO. 2010



# Background

## Forests' contributions to food security and nutrition

Forests and trees are closely linked to each of the four dimensions of food security – availability, access, utilization and stability – through the provision of employment, income, energy, nutritious foods, fodder and ecosystem services (Table 1).

### Availability

Forests and trees outside forests<sup>2</sup> are part of the availability dimension of food security by providing wild foods, livestock fodder and ecosystem services.

- Although foods from forests represent less than 0.6 percent of global food consumption (FAO, 2104), this low figure masks the importance of forest foods in certain communities around the world, some of which are highly, or entirely, dependent on forest foods.
- Forests and trees provide significant quantities of fodder for livestock, either as browse or as animal feed. For example, it is estimated 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). The contributions of fodder to food security and nutrition are twofold: Livestock are a source of meat and dairy, and animals can also be used for draught power and manure to increase the productivity of farming.
- In addition, trees in livestock systems also provide shade to animals which is important, especially in arid zones. For example, *Gliricidia maculata* and *G. sepium* were introduced at the end of the 18th century in Africa as shade trees for coffee, tea and cocoa plantations. *Erythrina burana* was used by Central Ethiopian farmers to shade the coffee plantations. It is very common in this part of the world but its properties became known only recently to scientists (FAO, 1992).

- A wide range of forest ecosystem services, including hydrological services, pollination, biological pest control, climate regulation, nutrient cycling, and soil formation, support and increase agricultural yields. For instance, trees in agroforestry systems enhance agricultural yields by fixing nitrogen, shading heat-sensitive crops, contributing to soil integrity and serving as windbreaks. Around 40 percent of global agricultural land has greater than 10 percent tree cover and can be considered agroforestry (Zomer *et al.*, 2009).

### Access

Forests contribute to the access dimension of food security by providing a source of income, for example through the sale of timber, fuelwood or charcoal and non-wood forest products (NWFPs) and through employment in forest enterprises (small, medium and large) (Box 2). Although the relationship between income and food security is highly complex and non-linear, food insecurity is generally associated with high levels of poverty and lack of opportunities for income and employment.

- The formal forestry sector – defined as commercial activities in the harvesting and production of industrial roundwood, fuelwood and charcoal; sawnwood and wood-based panels; pulp and paper; and wooden furniture – employed 13.2 million people in 2011 (FAO, 2014). The informal sector – defined as non-commercial, subsistence or unregulated and unreported small-scale enterprises – provided employment for an additional estimated 41 million people.
- Income from the production of roundwood, sawnwood, panels, pulp and paper amounted to about US\$600 billion in 2011, and the informal sector generated an additional US\$124 billion. It should be noted,

<sup>2</sup> "Trees outside forests" encompasses agroforestry systems, other trees on farms, and trees in non-forested rural and urban landscapes. (FAO, 2013)



Table 1. **Four dimensions of food security and their linkages to forestry**

Dimensions	Definition	Applicable level	Examples of linkages to forestry	Facts and figures
Food availability	Available food in total = production + imports + aid + exports – waste	National	<ul style="list-style-type: none"> <li>■ Availability of edible non-wood forest products (NWFPs)</li> <li>■ Support to agricultural and fishery production through forest ecosystem services</li> <li>■ Forest ecosystem services supporting and increasing agricultural yields</li> </ul>	<ul style="list-style-type: none"> <li>■ Edible NWFPs account for 16.5 kcal/person/day globally</li> <li>■ Some 50 percent of total crop production comes from forest and mountain ecosystems, including all tree crops, while crops cultivated on open, arable flat land account for only 13 percent of annual global crop production</li> </ul>
Food access	Economic, physical, social and legal access to food	Households and individuals	<ul style="list-style-type: none"> <li>■ Increased household income from wood industries, wood and NWFPs</li> </ul>	<ul style="list-style-type: none"> <li>■ Global annual income from roundwood, sawnwood, panels, pulp and paper: US\$600 billion</li> <li>■ Informal-sector annual income from fuelwood, charcoal and recorded NWFPs: US\$124 billion</li> <li>■ Forest employment: nearly 54 million people</li> <li>■ Forest owners: 30 million people</li> </ul>
Food utilization	Physical ability to obtain sufficient nutritional intake and nutrition absorption	Individuals	<ul style="list-style-type: none"> <li>■ Woodfuel for cooking</li> <li>■ Access to clean water for drinking and cooking</li> <li>■ Provision of protein and micronutrients</li> </ul>	<ul style="list-style-type: none"> <li>■ 2.4 billion people (one-third of the world's population) cook with wood</li> <li>■ In Africa, over 60% of the population relies on woodfuel for cooking</li> <li>■ About 765 million people use wood energy to sterilize water</li> </ul>
Food stability	Availability, access and utilization at all times without risks	All levels	<ul style="list-style-type: none"> <li>■ Safety net in times of need</li> <li>■ Climate change mitigation and adaptation through sustainable forest management</li> <li>■ Protection of ecosystem services for sustainable food production</li> </ul>	<ul style="list-style-type: none"> <li>■ Forests have the potential to absorb about 10% of global carbon emissions, if managed sustainably</li> <li>■ Forested watersheds and wetlands supply 75 percent of the world's accessible fresh water for domestic, agricultural, industrial and ecological needs</li> </ul>

Source: Jin and Reeb, 2014; FAO, 2014; FAO, 2008.

however, that the latter figure is probably greatly underestimated because it only includes income from the production of fuelwood and charcoal and the few NWFPs that are recorded in FAO's agricultural statistics (FAO, 2014).

- Globally, the reported value of NWFP removals amounted to US\$18.5 billion, 15 percent of the total global value of forest product removals in 2005 (FAO, 2011), although NWFP data are incomplete. Rural women, in particular, play a central role in sustainable harvesting of NWFPs and rely year-round on returns from their sale (FAO, 2013).
- Added value in the forestry sector contributes around 1 percent of global gross domestic product (FAO, 2014). Although the cash contribution of forest products to household income may not be large at the global level, it is still critical for the livelihoods of the 50 million people employed (formally and informally) in the sector and almost for 30 million forest owners (FAO, 2014).

### Utilization

Forests provide woodfuel for cooking and sterilizing water, micronutrient or protein-rich NWFPs and herbal medicines and thus are part of the utilization dimension of food security.

- Over half of all wood produced in the world is used for energy, affecting the nutritional status of about 2.4 billion people who rely on woodfuel for cooking and water sterilization, which reduce the risk of food- and water-borne diseases. Cooking increases the bio-availability of certain micronutrients<sup>3</sup> in food, makes protein in eggs and meat more easily digestible, and allows iron and other minerals to be better absorbed by the body. About 765 million people (10.9 percent of the global population) use wood energy to boil water to make it safe for drinking and for food preparation. Woodfuel is also used by many households in food preservation processes including traditional smoking and drying, extending the supply of food resources during non-productive periods.

### Box 2

## Small and medium-sized forest enterprises – influence on food security and nutrition status

Small and medium-sized forest enterprises (SMFEs) are prominent in developing countries. Rough estimates suggest that in many of these countries approximately 80-90 percent of forestry enterprises are comprised of SMFEs representing over 50 percent of all forest sector employment. Globally over 20 million people are employed by SMFEs offering an industry of 130 billion USD per year (IIED, 2007). SMFEs, if strengthened and supported by better enabling environment including capacity development<sup>4</sup>, can attract more investment thereby provide the potential to contribute to poverty reduction and improved food security and nutrition.

- If not used properly, woodfuel can have negative effects on health. However, improved stove systems can alleviate this risk. Therefore, if sustainably managed and safely utilized, woodfuel has the potential to remain the most affordable and renewable source of energy for cooking, water sterilization and smoking for a large share of the world's population, with low impact on climate change as the carbon emitted is re-captured by the growth of new trees.

<sup>3</sup> For instance, bio-availability of beta-carotene found in tomatoes, carrots, sweet potato increases when cooked; lycopene, anti-oxidant, found in tomatoes increases when tomatoes are cooked.

<sup>4</sup> While SMFEs have the potential to improve the food security and nutrition status of local people, limited local capacity, bureaucratic regulations, local power structures and tenure insecurity dampen the opportunities. SMFEs and community forest initiatives often benefit local elites who have the political, social and economic capital to invest and/or to acquire land and permits.

- Edible NWFPs gathered from the wild often have a high level of micronutrients or they may be rich in protein. Research has shown strong links between forest cover and dietary quality (Ickowitz *et al.*, 2014). Fruits, honey, roots and tubers, mushrooms, edible insects, edible leaves and nuts are excellent sources of protein and micronutrients such as vitamins A and C, calcium, iron, zinc and many others. These forest foods form a small but critical part of diets commonly consumed by rural, food-insecure populations, also adding variety to predominantly staple diets. In some communities with high levels of forest food use, wild forest foods alone are sufficient to meet minimum dietary guidelines for fruits, vegetables and animal source foods (Rowland *et al.*, 2015).
- Many NWFPs provide medicinal resources for a wide array of ailments. For example, it is estimated that at least 1 billion people use herbal remedies to treat children's diarrhoea (FAO, 2014).

### **Stability**

Forests contribute to the stability dimension of food security through the following mechanisms:

- Income and wild foods from forests provide a safety net during seasonal shortages and during times of famine, crop failure and economic, social and political shocks.
- Sustainably managed forest provide sustainable forest ecosystems which in turn are key for sustainable agriculture.
- Forest ecosystem services to agriculture decrease the likelihood of agricultural losses from extreme weather events such as droughts and floods leading to soil erosion and landslides.
- Forests have an essential role in mitigation of and adaptation to climate change, thus contributing to preventing climate-related food insecurity.

### **Challenges to ensuring the contribution of forests to food security and nutrition**

At international and regional bodies in forestry (e.g. the FAO Committee on Forestry and the United Nations Forum on Forests), the role of forests for food security and nutrition have been addressed with increasing importance. However, the lack of food security and nutrition objectives still remains in national forest policy, legal and institutional frameworks (and vice versa) and may lead to adverse effects on both sustainable forest management and food security and nutrition.

Some specific factors that contribute to food insecurity and malnutrition (FAO, 2013) include (see also Box 3):

- unclear and insecure legal tenure rights;
- weak governance;
- unequal distribution of forest benefits and gender bias;
- inadequate services for forest-dwellers;
- absence of concrete guidance and knowledge on how to best manage forests to maximize food security and nutrition outcomes.

Further, lack of intersectoral coordination, especially between forestry and agriculture, can have negative impacts on land and forest management and consequently on food security and nutrition. For example, agriculture is the single largest driver of deforestation, yet land-use decisions resulting in conversion of forests to agriculture generally fall under ministries and jurisdictions other than forestry. Food security policies in general fall under the purview of the ministry of agriculture, and often directly encourage the expansion of agriculture into forest lands, with little appreciation of the role of forests in providing food security and supporting agriculture. Nutrition policies are typically under the purview of the Ministry of Health or under a stand-alone Council, Secretariat, or similar, which have little to no coordination with the ministry responsible for forestry.

## Box 3

### Forestry challenges that can lead to food insecurity and malnutrition

- **Unclear and insecure legal tenure rights:** governments often fail to recognize traditional and customary tenure arrangements under which local people have used and managed forests for centuries. In many parts of the world, local people – especially indigenous people – are often excluded from the decision-making processes that determine the use of land and forests. When local people are displaced or lose access to forest land and resources, they frequently do not receive compensation, or compensation is paid to local elites. Many conservation initiatives and protected forest areas (such as national parks) exclude local people entirely or prohibit vital livelihood activities such as bushmeat hunting.
- **Weak governance:** poor governance can be a driver of deforestation in several ways. Where intersectoral linkages are weak, policies in higher-priority sectors- such as agriculture, mining, industrial development and energy – may have a greater impact on forests than the forest policy itself. Other potential aspects of poor governance include inadequate land-use and resource planning and monitoring; inadequate capacity for enforcing forest policies and combating illegal logging; inadequate involvement of local people and external stakeholders in decision-making processes; corruption; incoherent, incomplete or non-existent legal or regulatory frameworks; and inadequate investment in research and education (FAO, 2016b).

- **Unequal distribution of forest benefits and gender bias:** gender-differentiated tasks and responsibilities in food production and provision and the generation of cash income often mean that women and men have different needs, opportunities, priorities and concerns. Although women tend to commercialize forest products less than men, the sale of forest products can be an essential source of cash income for women, who lack many of the opportunities for generating cash income commonly available to men (Sunderland *et al.*, 2014).
- **Inadequate services for forest-dwellers:** many smallholder farmers and forest dwellers find it difficult to obtain the information, technology, finance, market access and other resources they need to improve their land management and build successful enterprises with which to achieve food security and adequate nutrition. Local institutions often lack the capacity to support the management and control of forests and trees outside forests, and the marketing of goods and ecosystem services, by smallholders. National and subnational institutions, policies and programmes rarely offer smallholders and other local people a genuine role in decision-making (FAO, 2013).
- **Absence of concrete guidance and knowledge on how to best manage forests to maximize food security and nutrition outcomes:** a wide range of resource materials separately addressing sustainable forest management practices, and improving food security and nutrition at national, regional and international levels are available. However, thus far, there is an absence of specific guidance nor knowledge on how to apply and promote sustainable forest management practices with explicit food security and nutrition objectives.

Box 4

### Voluntary pledges and certification schemes

Voluntary pledges and certification schemes, are private-sector and/ or civil society standards (not legally enforceable) representing a broad consensus of what defines “best practice” e.g. Forest Stewardship Council (FSC) certification, Programme for the Endorsement of Forest Certification (PEFC), “zero deforestation” pledges and best practice schemes in forest converting industries such as the Round Table on Sustainable Palm Oil (RSPO).

The private sector has made some commitment to protecting and improving food security and nutrition through voluntary certification schemes. Driven by global public pressure and civil society organizations, an increasing number of forestry companies have developed their own voluntary and social and environmental standards and signed on to voluntary certification schemes (Box 4), which require a company to adhere to a set of principles and criteria in order to obtain certified status. For example, the Forest Stewardship Council (FSC) forest certification standards include the concept of high conservation values (HCV) to ensure the maintenance of significant or critical environmental and social values, and these can be taken to include food security and nutrition (Box 5).

Box 5

### High conservation values: certification standards recognizing the value of forest conservation for food security and nutrition

As conceived by the FSC in the context of voluntary forest certification, an HCV is a biological, ecological, social or cultural value of outstanding significance or importance, whose conservation is therefore desirable. Six HCVs have been defined: species diversity; landscape-level ecosystems and mosaics; ecosystems and habitats; ecosystem services; community needs; and cultural values.

The fifth HCV, “community needs”, refers to protection of “*sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or indigenous peoples*”. Although it does not contain an explicit reference to food security, it can be a valuable tool towards setting aside areas of forest land important for the food security of local communities.

The HCVs have been widely adopted by other certification schemes besides FSC. They are also used for resource use and conservation planning by other organizations and institutions that seek to maintain and/or enhance environmental and social values as part of responsible management; and by industries, including those involved in forest conversion, such as commercial agriculture and mining. One prominent example is the Round Table on Sustainable Palm Oil (RSPO), a voluntary certification scheme using HCV assessments as part of broader principles and criteria for evaluating palm-oil-producing companies. The RSPO principles and criteria also include a direct reference to protecting and ensuring food security, although only specifically that of company employees.

Source: HCV Resource Network, 2005–2016.

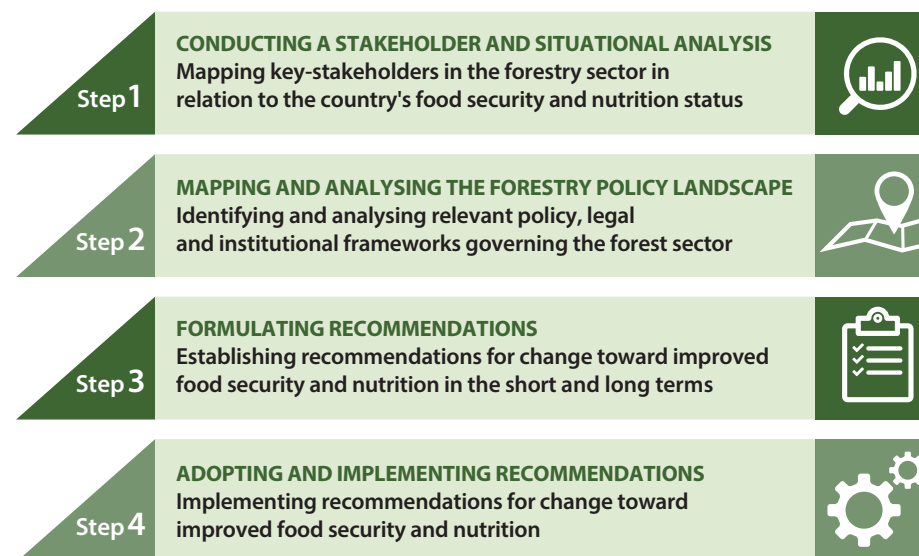
## Stepwise approach Addressing food security and nutrition in the forest sector

This section introduces a series of issues and questions to consider in order to identify the conflicts and trade-offs, and potential synergies and win-win situations between objectives of sustainable forest management and food security and nutrition objectives. Considering these questions in four steps (Figure 1) can assist stakeholders that contribute to policy-making related to the sector in recognizing possible adjustments to reduce conflicts and identify opportunities for influencing forestry, food security and nutrition policy agendas for better food security and nutrition outcomes. Using Nepal as an example, this chapter illustrates each step.

10

Policy recommendations should be supported by a sound analysis and understanding of the role of forests in food security and nutrition. The analysis should address both the current situation and potential strategies for sustaining food security and nutrition demands in the longer term, especially in the context of resource competition, deforestation and climate change.

Figure 1. **Four steps for addressing food security and nutrition outcomes in forest policy**



The four-step approach should facilitate the development of conducive forest policies and sustainable forest management practices supporting food security and nutrition objectives at landscape level.

### Step 1 **CONDUCTING A STAKEHOLDER AND SITUATIONAL ANALYSIS**

Such an analysis should be carried out through multi-stakeholder consultative processes, including representatives of civil society and groups that are dependent on the forest sector.

In most countries, the major actor in the forest sector is the ministry responsible for forestry, which often takes general direction from national policy created at the presidential or prime ministerial and parliamentary



level. For instance, many forest policies are developed by the forestry administration, and are endorsed by the minister. In some cases, they may also have to pass through parliament. However, numerous other stakeholders influence the direction of forest policy, legal and institutional frameworks depending on the country context.

In some cases, the interests of the ministry in charge of forestry may conflict with those of ministries responsible for sectors that have greater potential to provide employment, income, foreign exchange and economic growth (and hence higher budgets) in the short term, such as agriculture and mining. Possible conflicts could occur when pressure from civil society to conserve biodiversity and protect local livelihoods (for example through legal framework and land administration systems) cause negative impacts on commercial enterprises. Therefore, a stakeholder analysis should be carried out by carefully considering the broad dynamics within the country.

This step should be supported by preliminary reviews of existing data<sup>5</sup>, information and policy, legal and institutional frameworks which are influencing the contribution of forests to food security and nutrition. Data demonstrating the linkages between forests and food security are often anecdotal and local, are rarely disaggregated by gender, and are limited to certain target groups or partial aspects of the contribution of forests to food security and nutrition. However, data and information gaps can be filled through additional research and interviews with key stakeholders.

This analysis should ensure a meaningful participation of stakeholders across all relevant sectors, and should be conducted in gender-sensitive manner. While calling for a multi-stakeholder participation, attention should be paid to include farmers and rural people, and their representatives and organizations that will ultimately put policies into practice, and will do so only if these policies meet their needs and interests. By conducting the analysis under Step 1 (see Box 6 for an example), potential weakness in data collection and analysis can be identified. It will be essential to address



## Key questions

### Guiding the stakeholder and situational analysis

- Who are the main stakeholders in the forest and food security and nutrition sector?
- What are their interests and powers? Which stakeholders are most influential?
- Who sets the forestry and food security policy agendas? Who advises and influences whom?
- How does the forest sector in its current form contribute to the improvement of the four dimensions of food security and nutrition (of different groups)?
- What major trends (e.g. urbanization and other demographic changes, agricultural expansion, climate change) are having an impact on the forest sector over time, and how do they affect the contribution of forests to food security and nutrition situation of the country?
- What are the factors (e.g. policy, legal and institutional frameworks, access to market) that limit the contribution of forests to food security and nutrition?

the evidence gaps that hinder progress towards integrating food security and nutrition concerns in forest policy and vice versa. Further research can contribute to producing more reliable statistics on the role of forests in the four dimensions of food security.

<sup>5</sup> Data collection processes in the forest sector typically do not explicitly include metrics concerning food security and nutrition. For evidence-based decision-making on this topic, it is essential that indicators relevant to food security and nutrition be incorporated into the standard data collection processes in the sector.

## Box 6

## Analysis of national forestry sector of Nepal in the context of food security and nutrition

### Importance of forest sector for food security and nutrition

In Nepal, people's dependence on forest is very high<sup>6</sup>. On average, about two-thirds (64 percent) of the total households (FAO, 2014) use fuelwood as their usual source of fuel for cooking food and sterilizing drinking water. However, there is an increased trend of using liquefied petroleum gas (LPG) as a main source of cooking energy. The proportion of fuelwood as a source of household energy has been decreasing in recent years, especially in urban areas. By 2011, the proportion of the population using LPG as a primary source of cooking energy was slightly more than 21 percent countrywide but 68 percent in urban areas (CBS, 2011). In addition, the forest sector has an important role in providing irrigation to agriculture. For instance, more than 70 percent of the irrigation in Nepal comes from watersheds (in the form of surface irrigation), and the agriculture sector alone has a target to increase this figure to 77 percent by 2025 (MoAD, 2014)<sup>7</sup>. Hence, better conservation and management of watersheds is crucial for the sustainable supply of water for irrigation. About 40 percent of livestock fodder comes from forest. In 2014, the forest sector accounted for 200 000 jobs, thus employing 1.4 percent of the active population.

The Government of Nepal issued a new Forest Policy in 2015 following the expiry of the Master Plan for the Forestry Sector (MFSC, 1989). The policy includes a goal to contribute to national prosperity through sustainable management of forest and watershed areas (MFSC, 2015a).

### Stakeholders involved in forests and food security and nutrition policies

There is a lack of a national-level institutional mechanism to create synergy between the forest and agriculture sectors in such a way as to enhance food security and nutrition governance. However, some initiatives have recently started aiming to enhance cross-sectoral governance in both sectors, by establishing coordination

and partnership mechanisms within the government ministries and between the government ministries and NGOs and the private sector. For instance, an apex body of the National Biodiversity Coordination Committee, chaired by the Minister for Forestry and consisting of 27 members, including eight from sectoral ministries and other relevant stakeholders, coordinates the implementation of the National Biodiversity Strategy and Action Plan (MFSC, 2014). Another national apex body on REDD+ is a national-level multi-stakeholder forum chaired by the Secretary of MFSC (MFSC, 2015b).

Agroforestry policy is prepared in close collaboration with the Ministry of Agricultural Development (MoAD) and MFSC. Likewise, forestry is considered by the high-level Agriculture Development Strategy implementation body (MoAD, 2015). Coordination and partnerships with NGOs and the private sector are increasingly institutionalized in the forest sector. The Multi Stakeholder Forestry Programme, which ran for the past four years, included NGOs and civil society organizations in its national-level steering committee as well as in its field-level implementation. Similar arrangements are found in other national projects as well, although with inadequate inclusion of varied stakeholders. Despite progress in some specific projects and sectors, there is limited coordination among various policy formulation and implementation arms (e.g. parliamentary committees, the environmental council, planning bodies such as the National Planning Commission). At the district level, District Forest Coordination Committees have a mandate to bring various stakeholders together to discuss plans and budget (MFSC, 2011). Because of the lack of elected district government, this arrangement has not been as effective as envisaged in the committee regulations (*ibid*).

The Forest Policy also identifies the private sector as relevant and important, particularly for enhancing income and employment opportunities from the forest sector. However, in practice, the private sector continues to experience procedural hurdles and regulatory bottlenecks in running forest-based enterprises and businesses (Pandit *et al.*, 2015).

*Source:* Cross-sectoral Forestry and Food Security Policy Analysis of Nepal (FAO, 2016a).

## Step 2 MAPPING AND ANALYSING THE POLICY LANDSCAPE

Forest policy, legal and institutional frameworks for their implementation can have diverse impacts on food security and nutrition. Before the impacts can be analysed, it is necessary to have a clear picture of policy, legal and institutional frameworks governing forestry in the country. Commitments made as part of formal international agreements such as the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD) and the Convention on Biological Diversity (CBD) are also relevant, as these influence national forestry legislation and often guide national forest policies. In addition, the role of civil society and private sector (which may include the creation of voluntary certification schemes and the conduct of economic, social and environmental impact studies based on their own and/or international standards) should be taken into careful consideration while analyzing the policy landscape.

By conducting the mapping and analysis under Step 2 (see Box 8 for an example), key policy, legal and institutional frameworks in the forest sector (and other relevant sectoral policies, if appropriate) will be identified to provide an in-depth understanding of the policy environment. Such understanding is needed before policy recommendations are formulated to increase the contribution of forests to food security and nutrition.

<sup>6</sup> Forest occupies 5.96 million hectares (40.36 percent), and other wooded land covers 0.65 million hectares (4.38 percent).

<sup>7</sup> In the same period, MoAD aims to increase groundwater irrigation by 16 percent and non-conventional irrigation by 7 percent.

### → Key questions

#### Guiding the mapping

- What are the national policies in the forest sector? What are the policies influencing the forestry sector? What are their specific objectives and target groups? What challenges do they address?
- What are the legal and institutional frameworks supporting forest policy implementation? To what extent are they implemented and enforced?
- To which regional and international agreements, conventions and bodies are the national policies, legal and institutional frameworks committed?
- How are formal and informal policy processes organized (fora, coordination mechanisms, institutional set-up, rules and procedures)?
- How is policy debate organized?

#### Guiding the analysis

- Have food security and nutrition considerations been included in the different forest policy, legal and institutional frameworks? What are the intended results and who is targeted?
- What are the forest policies, legal and institutional frameworks that are NOT specifically mentioning food security and nutrition, but having impact on food security and nutrition?
- What are the actual and potential medium- to long-term effects (positive and negative) of the different forest policy, legal institutional frameworks on food security and nutrition (availability, access, utilization, stability)?
- How are the policy, legal and institutional frameworks in the forest sector interlinked? How do regional and international agreements, conventions and bodies influence national policy (and other relevant sectoral policies) in terms of food security and nutrition (Box 7)?

Box 7

## International agendas and agreements, voluntary pledges and certification schemes

### International agreements, conventions and intergovernmental bodies, including:

- United Nations Forum on Forests (UNFF)
- United Nations Framework Convention on Climate Change (UNFCCC)
- United Nations Convention to Combat Desertification (UNCCD)
- Convention on Biological Diversity (CBD)
- FAO Committee on Forestry (COFO)
- FAO Committee on World Food Security (CFS)
- Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (endorsed by CFS in May 2012)
- Intergovernmental Panel on Climate Change (IPCC)
- Regional and bilateral agreements

**Voluntary pledges and certification schemes**, i.e. private-sector and/ or civil society standards (not legally enforceable) representing a broad consensus of what defines “best practice”, e.g. Forest Stewardship Council (FSC) certification, Programme for the Endorsement of Forest Certification (PEFC), “zero deforestation” pledges and best practice schemes in forest-converting industries such as the Round Table on Sustainable Palm Oil (RSPO).

Box 8

## Mapping and analysing the policy landscape of Nepal

### National forestry policies, programmes and legal frameworks addressing food security and nutrition

The current national forest policy and strategy incorporates food security as one of the sub-outcomes to be achieved in the forest sector. Enhanced agricultural productivity by conserving soil and water, creating employment opportunities and generating income from forest-based wood and non-wood products are the key areas that the current forest policy and strategy focus on in relation to food security and nutrition. However, these have yet to be incorporated in actual programmes and legal frameworks. In the case of community forestry, forest sector legal frameworks and the Community Forestry Guideline (DoF, 2009) provide tree and forest tenure security to local communities, but several procedural and regulatory hurdles are preventing these provisions from materializing in actual practice. Since the formulation of the Gender Equality and Social Inclusion Strategy and the Community Forestry Guidelines, forest sector policy has taken a progressive approach in mainstreaming gender, but the effectiveness of gender mainstreaming has been an issue in the forest sector.

### Human and financial resources

Human and financial resources in the forest sector are far from adequate to address food security and nutrition concerns. This inadequacy is observed in relation to the capacity and number of technical staff and poorly established data collection and data management systems for feeding future planning and policy formulation processes. Collection, analysis and posting of data related to food security and nutrition, the forest sector and other important contributions of the forest sector such as ecosystem services are poorly organized.

*(cont.)*

Box 8 (cont.)

**Cross-sectoral forestry and food security and nutrition governance, coordination mechanisms and partnerships**

Cross-sectoral forestry and food security and nutrition governance, coordination and partnership mechanisms are slowly emerging in the forest sector. The Forest Sector Strategy formulation process is an example of such a cross-sectoral mechanism; it involved consultation of several other government ministries besides forestry, as well as private-sector entities and other organizations. However, inclusion of other sectors has been limited to one-time consultation rather than continuing through regular coordination and the establishment of a functional partnership mechanism for achieving food security and nutrition objectives.

**Evidence-based decision-making capacity**

Nepal's forest policy-making process is weak in terms of linking science and policy. Despite a prolific amount of independent research, mainly related to community-based forest management, very few studies are taken into consideration in the formulation of policies and strategies. In most cases, these policies and strategies are formulated based on the cumulative experience of the policy-makers, consultants contracted for the purpose and the MFSC staff in different departments and district offices.

**Food security and nutrition policies, programmes and legal frameworks addressing forestry**

Nepal's food security policy is under preparation. The recently formulated Agriculture Development Strategy (ADS) and Zero Hunger Challenge National Action Plan are the two important documents that specifically mention forestry as important component of agriculture sector policies. More specifically, 8 percent of the total budget required for the implementation of ADS is allocated to forestry, and MFSC is included as a member of the ADS high-level implementation committee.

**Step 3 FORMULATING RECOMMENDATIONS**

This step includes identifying adjustments that may be needed within the forestry sector to ensure better food security and nutrition outcomes, including the use of complementary policies. Formulating recommendations should be based on the assessment of the short- and longer-term impacts of the different policy, legal and institutional frameworks governing the forest sector on food security and nutrition as seen in Step 2.

**→ Key questions****Guiding the analysis**

- How can the forest sector better contribute to ensuring sustainable food production (e.g. agricultural and fisheries products)? What change is needed and how can this be achieved?
- How can the forest sector better contribute to nutritious and diverse diets, especially for those who are dependent on forestry for their livelihood? What change is needed and how can this be achieved?
- How can the forest sector better contribute to securing income among the vulnerable poor? What change is needed and how can this be achieved?
- Where woodfuel is important for food utilization and good nutrition outcomes for forest-dependent people, how can its safe and sustainable use be ensured? What change is needed and how can this be achieved?
- Which indicators of food security and nutrition are most instrumental in informing policy debate and facilitating decision-making towards enhancing the role of forestry in food security and nutrition? Which are the most important sources of data to consider for these indicators?

It will require a critical review of the trade-offs and conflicts, potential synergies and win-win situations between the objectives of sustainable forest management and those of food security and nutrition; and second, the extent to which policy implementation by the different institutions involved is coordinated and coherent. Answering these questions will lead to the formulation of recommendations to strengthen the role of forests for food security and nutrition (see example of Nepal in Box 9). Potential outcomes of the analysis could include the following recommendations:

- Recognize and strengthen the rights of indigenous people and other local communities to sustainably use and manage forests and trees outside forests;
- Promote community-based forest management practices, which have potential to meet the food security and nutrition needs of local populations;
- Promote integrated forest management practices<sup>8</sup> such as agroforestry;
- Increase access of smallholders and communities to credit, technology, extension services and insurance, as well as to markets, to increase their income from their forest and tree products and ecosystem services;
- Develop and strengthen mechanisms for the timely collection and dissemination of data on the contribution of forests to food security and nutrition;
- Support research to identify best practices to enhance the contribution of sustainable forest management practices to food security and nutrition;
- Develop forest management guidelines for meeting food security and nutrition objectives;
- Adapt forestry curricula to include food security and nutrition subjects;
- Provide on-the-job training to forestry staff on the role of forests for food security and nutrition.

<sup>8</sup> However, in some specific cases land-use management is limited by some higher priority issues such as protection and preservation of specific areas of forests and/or biodiversity hotspots. Therefore, it may not be possible to implement integrated approaches in certain contexts.

## Box 9

### Formulating recommendations for increased contribution of the forestry sector to food security and nutrition in Nepal

Taking the analysis carried out under Step 2, the following recommendations were formulated:

- Legislative frameworks (Forest Act 1993 and Rules 1995) should be amended to incorporate food security and nutrition issues and to guide all forest sector departments to address these issues.
- Nepal's periodic development plans should also explicitly guide sectoral policies and programmes to incorporate food security and nutrition issues and facilitate effective synergy among them.
- National food security policy (being developed) should incorporate the vital contribution of the forest sector and should explicitly recognize the need to ensure an effective link between forest and food security.
- The forest sector should allocate adequate budget for capacity development of the staff, covering food security and nutrition issues in the staff training curricula as well as outreach for community members.
- Establishing a foresters' council could help to address some of the gaps in service provisioning and the inadequacy of human resources by outsourcing forest sector services to registered professionals. Unlike professionals in other sectors such as engineering, foresters are not currently allowed to offer their technical services independently as registered professionals.
- Given the important role of NGOs and private-sector groups in forest development, there is a need to reorient and instruct these actors so that they can champion the forest–food security interface in their projects, programmes and practices.

(cont.)



*Box 9 (cont.)*

- Agroforestry policy (being formulated) should help to address the gaps currently seen between the work of MFSC and MoAD in relation to agroforestry, the forest–agriculture interface and food security. In developing strong cross-ministry collaboration and coordination mechanisms, technical matters of agroforestry, including field implementation arrangements, should be handled by MoAD and relevant legal matters by MFSC.
- An integrated database and knowledge repository on forest, agriculture, land use and food security should be developed, and platforms and facilities created for analysis to inform food insecurity and nutrition policy and planning.
- Forestry- and agroforestry-based enterprise development should be promoted and supported by involving the private sector, including financial institutions such as banks, to facilitate access to capital and high-quality entrepreneurship skills and, more importantly, to address the persistent regulatory hurdles in the forest sector.
- An overall forest wealth accounting survey should be conducted to estimate the total wealth (all resources and services) available in the forests (including regular updates on forest’s contributions to gross domestic product) and its actual contribution to food security and nutrition (covering subsistence use of direct food products, income, employment and increased agricultural productivity through enhanced farm–forest linkages).
- The capacities of local communities involved in community-based forest management should be continuously strengthened to ensure

effective management of forest resources to address food security and nutrition needs without compromising forest conservation goals.

- A poverty focus should be maintained in forest sector services delivery, emphasizing food security and nutrition benefits from forest management.
- More effective interventions should be designed for tackling persistent gender gaps in the forestry sector, from MFSC and department levels down to community groups. Work with women’s groups should build women’s capacity to voice their concerns at all levels of decision-making and planning.
- Given the widespread effect of the feminization of tasks related to food security from forestry and agricultural development, there is a need to promote and scale up technologies that require minimal labour inputs but promote high income potential from enterprises in forestry, agroforestry, agriculture and landscape management.
- Monitoring and evaluation systems should be strengthened at the central level and also potentially at the provincial level (well linked to the central system), with the active involvement of government, NGOs and private-sector groups that are contributing, or have the potential to contribute, to food security and nutrition directly or indirectly.
- Promoting payments for environmental services and developing mechanisms and facilitating dialogue to connect upstream and downstream communities can contribute to effective soil and water conservation in watersheds. In this regard, it is crucial to consider the potential impact of changing climate on the hydrological cycle and water supply system of a watershed.

## Step 4 ADOPTING AND IMPLEMENTING RECOMMENDATIONS

This final step should provide an opportunity to consider the country context in order to identify ways to adopt and implement the recommendations formulated under Step 3. The guiding questions below will help identify ways to adopt and implement the recommendations by understanding, among others, the key stakeholders to be involved in the process, the types of support that are required, and the policy arenas requiring interventions. Further assistance and guidance on the adoption and implementation of forest policies can be found in existing resource materials, including “Developing Effective Forest Policy – A guide” (FAO, 2010).

While conducting Step 4 (see Box 10 for an example), coordination between policies on forests, agriculture, food, land use, rural development, water and climate change is required. Setting cross-sectoral priorities or strategic targets calls for coordination measures such as those provided in Table 2.

Maintaining political will and using the momentum for change through concrete follow-up action is key for implementing recommendations. After the policy recommendations are formally adopted, the process of implementing recommendations needs to be supported by:

- aligning the institutional framework and institutions with the recommendations;
- aligning forest-related legislation and other regulatory provisions;
- developing and/or adjusting action plans, including for communication and capacity building, and setting up financial arrangements and budgets (FAO, 2010).

### → Key questions

#### Guiding the adoption of recommendations

- Which stakeholders need to be involved for improved coordination for the recommendations identified under Step 3?
- Which stakeholders support and oppose identified policy recommendations?
- Who are the potential or actual policy champions?

#### Guiding the implementation of policy changes

- Are there any existing strategies, institutional framework, institutions, legislation, regulatory provisions and action plans which can support (if not supporting already) the implementation of policy changes? Are they sufficient? What can be improved?
- Is there any integrated planning platform (Box 11) to support the implementation of policy changes? If not, what can be done?
- Are there any best forest management practices enhancing food security and nutrition available? What are the needs for further research?
- What are (or could be) the relevant coordination measures across sectors?
- What are (or could be) the relevant coordination measures across sectors?

Table 2. **Examples of coordination between sectors**

Sector/policy type	Sectors cited for coordination	Coordination measures
Agriculture	Rural development, forestry, land management, environment	<ul style="list-style-type: none"> <li>■ Secretariat/programmes for coordination of sectoral policies</li> <li>■ Revision of other sectors' policies and legislation to align with agriculture policy objectives</li> <li>■ Reforms to harmonize the conflicting legal rights and objectives in the national land policy</li> <li>■ Formal recognition that effective implementation needs intrasectoral and intersectoral coordination</li> </ul>
Forest	Agriculture, land use, industry, energy, tourism, food security, others	<ul style="list-style-type: none"> <li>■ Development of a planning and implementation framework to harmonize forestry with other national economic sectors and coordinate programme implementation</li> <li>■ Use of multi-stakeholder consultations, technical working groups, technical assistance and partners</li> <li>■ Cross-sectoral, holistic land-use planning that promotes coordination among jurisdictions and across local government borders and avoids overlapping claims on forest land</li> <li>■ Harmonization with national land demarcation programmes</li> </ul>
Food security	Agriculture, forests, nutrition, water	<ul style="list-style-type: none"> <li>■ Participatory management of policy actions by creating multi-sectoral and multi-stakeholder management bodies</li> <li>■ Policy coordination and coherence by aligning policies and action plans with other relevant food security and nutrition policies</li> <li>■ Commissions or inter-ministerial committees to improve national dialogue on food security</li> </ul>
National development	Agriculture productivity, land, fisheries, forestry	<ul style="list-style-type: none"> <li>■ Measures to prevent land-use change between forest and agriculture</li> </ul>

Source: FAO, 2016b.

## Box 10

**Implementing policy changes**

Taking into consideration the wide range of recommendations established under Step 3, operational guidelines and procedures should be developed in order to ensure sound implementation of cross-sectoral forest and food security policy and relevant strategies and programmes, and to improve alignment and coordination between policies and practices on the ground. The operational guidelines and procedures should take into consideration the existing challenges and possible solutions in practical terms. The process is proposed and led by MFSC, in coordination with all other relevant ministries such as MoAD, as well as with development agencies such as FAO.

*Source: Cross-sectoral Forestry and Food Security Policy Analysis of Nepal (FAO, 2016a).*

At the end of the four-step approach, one should be able to identify effective ways to support and implement policy change, considering the country context, to increase the contribution of forestry to food security and nutrition objectives.

## Box 11

**An example of implementing policy changes: Indonesia's One Map initiative**

An example of cross-sectoral coordination is integrated land-use planning at the country level. Effective land-use planning is challenged when different line ministries and agencies – at central and decentralized levels – undertake their own land-use planning using separate processes, information and maps. In order to strengthen the links between forests, agriculture and other sectors, coordinated approaches are needed, especially when forests and agriculture are under the jurisdiction of different ministries (FAO 2016b).

Unifying the databases that support decisions on land use can help prevent inconsistent approaches to land-use planning among different government agencies. Indonesia approved its One Map initiative in 2014 for a similar purpose as part of its REDD+ strategy. The aim of the initiative is to help resolve disagreements arising from the use of different data and maps, such as overlapping permits for plantation and mining operations. The Geospatial Information Agency has published a basic geospatial information map for use by government agencies, along with a national land-cover map, a national sea grass/shallow waterbed map, a national maritime characteristics map, and a provincial mangrove map of Sumatra. Accurate and up-to-date geospatial information will also help the government to draft policies, resolve land disputes and manage its assets.

*Source: FAO, 2016b.*

## Concluding remarks

The Sustainable Development Goals agenda makes achieving food security and ending malnutrition a global priority. Although forests provide a wide range of socio-economic benefits (including their important contribution to food security and nutrition), global forest area has declined by 129 million hectares (3.1 percent) from 1990 to 2015 (FAO, 2016b).

Restoring forest conditions that can benefit food security and nutrition is a complex issue and requires responses at different levels. Improved land governance combined with institutional and tenure reforms, capacity development and political will are necessary to maintain adequate forest cover and to manage forests in a sustainable manner.

One way forward is to ensure that the objectives of sustainable forest management and food security and nutrition are interlinked in all relevant policies and legal and institutional frameworks at national level. This will require a change of perception in which food security and nutrition is recognized as one of the key objectives of sustainable forest management.

Improved awareness and recognition of the inter-relationship between sustainable forestry and food security and nutrition, supported by enhanced evidence, is expected to maintain healthy forests, which are ultimately key for sustainable agriculture and food security and nutrition.

## References

- CBS. 2011. *Statistical Year Book Nepal*. Kathmandu, Central Bureau of Statistics, National Planning Commission, Government of Nepal.
- DoF (Department of Forest). 2009. *Community Forestry Guideline*. Kathmandu, Ministry of Forest and Soil Conservation.
- FAO. 1991. *Household food security and forestry: an analysis of socio-economic issues*. Rome.
- FAO. 1992. *Trees as browse and to support animal production*. Rome.
- FAO. 2008. *Climate Change and Food Security: A Framework Document*. Rome.
- FAO. 2010. *Developing Effective Forest Policy – A guide: FAO Forestry Paper 161*. Rome.
- FAO. 2011. *State of the World's Forests 2011*. Rome.
- FAO. 2013. *Forests and trees outside forests are essential for global food security and nutrition*. Summary of the International Conference on Forests for Food Security and Nutrition, Rome, 13-15 May 2013. Rome.
- FAO. 2013. *Women in forestry: challenges and opportunities*. Rome. (Brochure.)
- FAO. 2014. *State of the World's Forests 2014: Enhancing the socio-economic benefits from forests*. Rome.
- FAO. 2016a. *Cross-sectoral Forestry and Food Security Policy Analysis of Nepal*. Rome
- FAO. 2016b. *State of the World's Forests 2016: Forests and Agriculture: Land-use Challenges and Opportunities*. Rome.
- HCV Resource Network. 2005–2016. Website (available at [www.hcvnetwork.org](http://www.hcvnetwork.org)). Accessed April 2016.
- Ickowitz, A., Powell, B., Salim, M.A. & Sunderland, T.C.H. 2014. Dietary quality and tree cover in Africa. *Global Environmental Change*, 24: 287-294. DOI:10.1016/j.gloenvcha.2013.12.001.
- IIED Small and medium forest enterprises and associations. 2007. Website (available at [www.iied.org/small-medium-forest-enterprises-associations](http://www.iied.org/small-medium-forest-enterprises-associations)). Accessed August 2016.
- Jin, S.-Y. & Reeb, D. 2014. Storage of food, reviewing the value of forest – forest and food security. *World's Food and Agriculture and Fisheries* (FAO Korea Association), 611(56): 38-41. [Korean].
- MFSC (Ministry of Forest and Soil Conservation). 1989. *Master Plan for the Forestry Sector, Nepal*. Main Report. Kathmandu.
- MFSC. 2011. *Directives for the Formation and Conduct of District Forest Coordination Committee (DFCC) 2068* [Nepali]. Kathmandu.
- MFSC. 2014. *Nepal National Biodiversity Strategy and Action Plan 2014–2020*. Kathmandu.
- MFSC. 2015a. *Forest Policy*. Kathmandu.
- MFSC. 2015b. *REDD+ Strategy for Nepal* (first draft). Kathmandu, REDD+ Forestry and Climate Change Cell.
- MoAD (Ministry of Agricultural Development). 2014. *The Agriculture Development Strategy*. Kathmandu.
- MoAD. 2015. *Agriculture Development Strategy (2015–2035)*. Kathmandu.
- Pain, A., Ojha, H.R. & Adhikari, J. 2014. Social inequality and food insecurity in Nepal: risks and responses. In I. Christoplos & A. Pain, eds. *New challenges to food security: from climate change to fragile states*, pp. 221–240. London and New York, USA, Routledge.
- Rowland, D., Blackie, R.R., Powell, B., Djoudi, H., Vergles, E., Vinceti, B. & Ickowitz, A. 2015. Direct contributions of dry forests to nutrition: a review. *International Forestry Review*, 17(S2): 45-53.
- Sunderland, T., Achdiawan, R., Angelsen, A., Babigumira, R., Ickowitz, A., Paumgarten, F. & Reyes-García, V. 2014. Challenging perceptions about men, women, and forest product use: a global comparative study. *World Development*, 64 (Supplement 1): S56–S66 (available at [www.sciencedirect.com/science/article/pii/S0305750X14000692](http://www.sciencedirect.com/science/article/pii/S0305750X14000692)).
- Zomer, R.J., Trabucco, A., Coe, R. & Place, F. 2009. *Trees on farm: analysis of global extent and geographical patterns of agroforestry*. Nairobi, Kenya, World Agroforestry Centre.







[www.fao.org/3/a-7215E.pdf](http://www.fao.org/3/a-7215E.pdf)