

# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

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ISSUE PAPERS**



**14**  
THEMES

## Highlights

- The right to adequate food is a universal human right that is realized when all people have physical and economic access at all times to adequate food or the means for its procurement, without discrimination of any kind.
- Despite progress made in reducing chronic hunger, undernourishment still affects at least 842 million people worldwide. Guaranteeing fair access to resources, rural employment and income are key to overcoming hunger and food insecurity.
- Ensuring food security requires action in multiple dimensions, including: improving the governance of food systems; inclusive and responsible investments in agriculture and rural areas, in health and education; empowering small producers; and strengthening social protection mechanisms for risk reduction.
- Hunger and food insecurity can be ended within a generation. For this to happen, however, more concerted efforts are required. All the pledges made to eradicate hunger and food insecurity need to be translated into policy and programme implementation and the mobilization of sufficient financial resources.
- Given that food security is defined and understood through its four dimensions – availability, access, stability and utilization – it can best be explained and measured through a 'suite of indicators'.

## Food security and the right to food

### Overview

The world has the capacity to produce enough food to feed everyone adequately. Yet despite progress made over the past two decades, at least 842 million people in the world, or one in every eight human beings, still suffer from hunger on a daily basis. While it has fallen by 17 percent since 1990-92, this persistently high number remains unacceptable.

Beyond its ethical dimension, hunger and food insecurity take an enormous toll on economies and have adverse consequences for the livelihoods and economic capabilities of vulnerable populations. The costs to society are enormous in terms of lost productivity, health, well-being, decreased learning ability and reduced fulfillment of human potential.

Similar to extreme poverty, food insecurity continues to be predominantly concentrated in rural areas and disproportionately affects rural communities, especially poor farmers, agricultural workers and pastoralists.

Strong interdependencies exist between food security and many other parts of a broad sustainable development agenda that addresses questions related to inclusive economic growth, population

*"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (definition agreed to at the 1996 World Food Summit).*

dynamics, decent employment, social protection, access to clean water, energy, health, sanitation, natural resource management and the protection of ecosystems. Moreover, empowering women and addressing inequalities – notably gender and rural-urban – are as critical to fighting hunger and ensuring food security, as they are to universal sustainable development.

Today, millions remain deprived of their right to adequate food. The realization of the right to adequate food will only occur “when every man, woman and child, alone or in community with others, has the physical and economic access at all times to adequate food or means for its procurement”. Enshrined in international law, the legally binding nature of the right to adequate food goes beyond a moral obligation. To assist States, the [Voluntary Guidelines to support the progressive realization of the right to adequate food](#) in the context of national food security provide practical guidance for policy formulation and implementation as well as an additional instrument to combat hunger and poverty.

## Key challenges

Despite progress made in fighting hunger and food insecurity, the international community must address significant challenges to meet the needs of the millions of hungry people today and those of a rapidly growing world population. Recent progress in reducing food insecurity has been mixed across continents and within countries.

The broad environment that encompasses food systems, and their production and consumption components, has changed considerably in recent years. New forms of investment are flowing into food and agriculture systems and new patterns of food system governance are emerging. The environment for food and agricultural production is increasingly challenging – particularly for smallholders – due to natural resource degradation, more frequent and severe weather events, globalization, urbanization and market concentration, just to mention a few examples.

Higher and more volatile food prices have slowed or even reversed progress in reducing food insecurity in many countries, highlighting the fragility of the global food system. Food prices are likely to remain relatively high and price volatility is expected to become more common in the future.

## What needs to be done?

While current and future challenges differ from those of the past, responses to the new challenges can build on lessons learned. Experience tells us that there is an urgent need for a universal agenda, for country and context-specific strategies, and for people-centered approaches.

Given the complex challenge of eradicating hunger and food insecurity, progress will depend on effective governance systems and the involvement of many stakeholders across sectors, with empowered participation, transparency, equity and accountability as key principles.

- **Explicit political commitments** need to be made and sufficient resources allocated in a timely and effective manner for the eradication of hunger and food insecurity. They should be backed by a sound evidence base through the generation and access to data and information, and a common understanding of underlying causes. Coordinated actions should be encouraged through multidisciplinary approaches and partnerships, with all of this underpinned by international standards and agreements, policy dialogue, global governance mechanisms, advocacy and communication;
- **Appropriate governance mechanisms** need to be established at regional and country levels. At global level, the Committee on World Food Security (CFS) provides a unique platform for food security governance. At regional, national and sub-national levels, various sectoral policies and programmes need to be designed and coordinated in ways that ensure relevance and purposeful action towards the eradication of hunger, food insecurity and malnutrition. Good practices that lead to greater impact, including through human rights-based approaches and gender-sensitive policies, programmes and investments, need to be promoted;
- **Accountability mechanisms and monitoring capacities** need to be strengthened in all phases of sector-wide and cross-sectoral policies, programmes and investments, to ensure the greatest possible impact. Knowledge-exchange mechanisms as well as institutional and individual capacity development efforts should be supported.

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**14**  
THEMES

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- Good nutrition is a pre-condition for a healthy and productive life; malnutrition in all of its forms imposes high economic, social and human development costs on individuals, households, communities and countries.
- Improving nutrition requires multi-sectoral policies and strategies supported by effective coordination and accountability mechanisms, and the capacity to transfer nutrition targets into actions and impacts.
- The food and agriculture sector has the primary role of feeding people by increasing the availability, affordability, and consumption of diverse, safe, nutritious foods and aligned with dietary recommendations and environmental sustainability.
- The contribution of agriculture and food systems to nutrition can be enhanced by setting explicit nutrition objectives, improving equity and targeting, gender sensitivity and environmental sustainability.

## Nutrition

### Overview

Malnutrition in all of its forms – undernutrition, micronutrient deficiencies, obesity and diet-related non-communicable diseases (NCDs) – imposes unacceptably high economic and social costs on countries. It is one of the greatest impediments to human and national development. Malnutrition adversely affects physical growth as well as cognitive development of the unborn and young children, undermining the capacities and capabilities of individuals and communities.

FAO's most recent estimates indicate that at least 12 percent of the world population, or 842 million, go to bed hungry or suffer undernourishment in terms of energy intake; one in eight people are not getting enough food to maintain an active life. These figures represent only a fraction of the global burden of malnutrition. An estimated 26 percent of children under the age of five are stunted (too short for their age) due to chronic undernutrition. Two billion people suffer from one or more micronutrient deficiencies or "hidden hunger". At the same time, 1.4 billion people are overweight, of whom 500 million are obese.

The economic and social costs of malnutrition to the global economy are very high. Loss of productivity and direct health care spending can account for as much as five percent of the global gross domestic product (GDP), equivalent to USD 3.5 trillion a year.

## Key challenges

The immediate causes of malnutrition are complex and multidimensional. They include inadequate availability of, and access to safe, diverse, nutritious food; lack of access to clean water, poor sanitation and inadequate health care; and inappropriate child feeding practices. The root causes of malnutrition are even more complex and encompass the broader economic, social, political, cultural and physical environment.

Trends in economies and societies are altering the ways people produce, process, acquire and consume food. Food supply chains are changing in many ways. Changes in activity and dietary patterns, especially in developing countries, have contributed to the “nutrition transition” in which countries simultaneously face rising levels of obesity associated with excessive consumption, while continuing to deal with problems of undernutrition (both dietary energy undernourishment and micronutrient deficiencies).

It is not uncommon to have both undernutrition and obesity co-existing within the same country, household or individual, a situation referred to as the multiple burdens of malnutrition. This situation clearly points to a failure in getting the right foods to those who need it when they need it.

Food quality and safety issues represent another great challenge for healthy nutrition. For many developing countries, national food control systems are not adequate – infrastructure is weak, food laws and regulations are not up to date, and the institutional capacity to enforce rules is insufficient.

## What needs to be done?

These multidimensional causes require integrated actions across sectors to address the malnutrition challenge. Better political and policy coherence, alignment, coordination and cooperation among food, agriculture, health and other sectors are needed to improve global nutrition. Successful examples of integrated policies addressing nutrition are available and can inspire further progress.

Eradicating malnutrition and its associated social and economic costs must begin with agriculture and food systems. The role of agriculture in producing food, generating income and supporting livelihoods is fundamental, and its direct role in enhancing nutrition deserves greater policy attention. Sustainability is central

to the nutrition agenda, as we must ensure food security and good nutrition for all, today and tomorrow. To be effective in enhancing nutrition, food and agriculture programmes and policies must incorporate nutrition targets and indicators, strengthen coordination with other sectors, be sensitive to gender roles, especially those of women in household nutritional and child care.

To ensure food safety and quality, international standards needs to be promoted. Countries should build the means necessary to ensure an adequate supply of safe and good quality food. However, food quality and safety goals can only be realized if strategies, within adequate legal frameworks, are supported by sound investment plans.

*Food systems - the resources, environment, people, institutions and processes with which food is produced, processed, stored, distributed, prepared and consumed - determine the quantity as well as the quality of the food supply in terms of nutritional content, diversity and safety. Agriculture broadly understood (crop and livestock production, fisheries and forestry) and potable water are the basis of food systems*

Social protection programmes, associated with nutrition education and designed to promote diversification of livelihoods and diets, can facilitate access to basic services and play key roles in improving nutrition outcomes. The consumer must be empowered to demand healthy and nutritious foods.

In the past few years, there has been far more attention paid to the multiple burdens of malnutrition, with national and international initiatives rising to the challenge (e.g. with the emergence of the First 1 000 Days campaign and the Scaling Up Nutrition (SUN) Movement). The launch of the Global Panel on Agriculture and Food Systems for Nutrition can also refocus attention on opportunities to maximize the contribution of agriculture and food systems to improve nutrition. The upcoming International Conference on Nutrition (ICN2) will help keep the spotlight on nutrition by identifying priorities for international cooperation in the coming years. The post-2015 development agenda presents a real opportunity to make a difference in addressing malnutrition.



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**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14  
THEMES**

## Highlights

- Poverty has declined worldwide, but progress has been uneven. Extreme poverty is mainly concentrated in rural areas.
- Rural development and agricultural productivity growth are crucial for poverty reduction.
- Deteriorating ecosystems, unsustainable natural resource management and climate change are disproportionately affecting the poor. Unless these trends are halted and reversed, the goal of eradicating poverty will remain elusive.
- Poverty cannot be eradicated without addressing the pervasive inequalities in incomes and economic opportunities between and within countries, between rural and urban areas, and between men and women. Reducing such inequalities will need to start with improving access for the poor to productive resources, basic services and social protection.

## Poverty eradication

### Overview

The Millennium Development Goal (MDG) target of halving extreme poverty by the end of 2015 has been met, as the proportion of people living on less than USD 1.25 (purchasing power parity) per day (the *extreme poverty* line for 2005) in developing regions fell by more than half from 1990 to 2010.

Progress has, however, been uneven, with a few Asian countries, primarily China, accounting for most of the decline. The rate of poverty reduction has been much slower in low-income countries, especially in sub-Saharan Africa where the absolute number of poor has continued to increase.

*Eradicating* poverty con to be a major challenge and thus will need to remain a central goal of the post-2015 development agenda:

- An estimated 1.2 billion people in developing countries still live in extreme poverty;
- Moderate poverty (those living on less than \$2 PPP per day) has declined at a much slower pace; while many may have escaped extreme poverty, the gains are easily reversible;
- Both extreme and moderate poverty remain primarily rural, with 75 percent of the world's poor living in rural areas and most dependent on agriculture;
- The poor have few decent work opportunities, as most live in areas where productivity is low, local economic activity is inadequately diversified, underemployment rates are high and jobs are insecure;
- Poverty pushes many children into the labour market. Almost 60 percent of child labour worldwide is found in agriculture, where children often

work in hazardous conditions, putting children's health, education and life chances at risk;

- Gender gaps are often more pronounced among the poor. For example, the gap in years of schooling between poor women and men is more than double that among the non-poor;
- Low-income people are at great risk of being food insecure and malnourished.

## Key challenges

Typically, rural poverty reduction has been achieved in contexts of rapid economic growth. Economic growth is no panacea, however. Rural poverty has persisted where policies paid insufficient attention to improving agricultural productivity and rural infrastructure and failed to provide rural populations with access to social services and social protection or facilitate the development of rural producer and consumer organizations. Failing to improve access for disadvantaged groups, and particularly women, to productive resources and social services further perpetuates rural poverty.

Climate change and other environmental threats, rapid population growth and migration are putting disproportionate pressure on livelihoods in rural areas where poverty is already entrenched and people have the least resilience. Challenging as this may be, sound management of natural resources and ecosystems need to go hand in hand with efforts to reduce poverty.

## What needs to be done?

Eradicating extreme poverty and substantially reducing moderate poverty by 2030 requires major shifts in policy priorities. To ensure that no one is denied universal human rights and basic economic opportunities, any new development agenda should focus on ensuring inclusive economic growth and reducing inequalities.

Employment opportunities need to be generated, consistent with the decent work agenda. As the vast majority of poor people live in impoverished rural areas, the main focus must be on building more productive, diversified and resilient local rural economies with stronger rural-urban economic linkages, and through the accelerated adoption of climate-smart and sustainable production methods. This will require a transformative agenda:

- The majority of the rural poor are smallholder farmers, who are responsible for most global food production. Helping them to improve farm productivity through better access to resources, technologies, markets and organizations will be critical for both poverty eradication and food security. Compared to general growth in low-income developing countries, agricultural growth's impact on poverty reduction could be as much as five times greater;
- Reducing poverty requires ecological and resource sustainability. Increased food production will exacerbate land degradation, greenhouse gas emissions and biodiversity loss unless production methods and consumption patterns become more sustainable. Smallholder farmers will need affordable access to technologies and infrastructure to sustainably transform food systems;
- Diversification of employment into non-agricultural activities will be essential to accelerate both rural and urban poverty reduction. Growth of non-farm activities is often driven by agricultural growth and can stimulate local employment creation;
- Closing the gender gaps in education and access to productive resources can substantially boost women's empowerment and incomes, particularly in agriculture and rural areas;
- Roads and electricity improve connectivity to markets, strengthen rural-urban linkages, increase agricultural and non-agricultural productivity and create employment;
- Better social protection can help the poor better manage risks, improve their livelihoods, and enhance the health and education of their children. It will thus not only help accelerate the eradication of poverty and hunger, but also reduce disparities in life chances;
- Early investments in education, health and nutrition in rural areas are essential. Many youth face bleak economic prospects whether they stay in the countryside or migrate to cities. Increasing gainful opportunities by enhancing the skills of rural youth, and upgrading and diversifying local economic activities is therefore essential for improving youth prospects;
- Addressing undernutrition will also contribute to poverty reduction by enhancing economic capacity, human capability and earnings potential, through better physical and cognitive development and sufficient dietary energy to be productive.

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**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14  
THEMES**

## Highlights

- Resilience must be embedded in the institutional, social, economic and environmental dimensions of sustainable development, in efforts at all levels to fight hunger and malnutrition.
- The resilience agenda provides a common overarching framework for systematically linking and integrating risk reduction and crises management. It brings together development, policy, investment and humanitarian actors.
- Resilience addresses multi-hazard risks and underlying causes of vulnerability in an integrated way. The implementation of specific resilience measures must be anchored to sector-specific, short- and longer-term interventions.
- Cross-sectoral coordination to reduce disaster and climate risks for the resilience of livelihoods of the most vulnerable smallholders is fundamental. It will help to build bridges between existing silos.
- The promotion of resilience of livelihoods calls for synergies among technical good practices for disaster risk reduction and climate change adaptation, food chain crises prevention, social protection, financial risk transfer and tenure of natural resources for the most vulnerable.

## Resilience

### Overview

The recurrence of disasters and crises undermines nations' efforts to eradicate hunger and malnutrition and to achieve sustainable development. About 2.5 billion smallholder farmers, fishers, tree-dependent communities, livestock-owners, and small entrepreneurs who depend on the production, marketing and consumption of crops, fish, forests, livestock, and other natural resources are threatened by disasters and crises. Over the past 12 years, disasters have caused an estimated USD 1.3 trillion in damages, causing the loss of life of 1.1 million people and affecting another 2.7 billion. In 2012 alone, disasters caused economic losses estimated at USD 138 billion, continuing the recent upward trend and marking the first time that annual economic losses have exceeded USD 100 billion in three consecutive years.

Disasters and crises threaten the production of, and access to, food at local, national and, at times, regional and global levels. Shocks can strike sudden - like a flash flood or a violent coup d'état - or unfold slowly, like drought-flood cycles. Crises can occur as a single emergency, one can trigger another, or multiple events can converge and impact simultaneously with cascading and magnified effects. As an example, three years of repeated floods (2010 to 2012) have inflicted serious damage on Pakistan's economy, halving its potential growth. Pakistan lost a total of USD 16 billion to the floods in these three years, with estimated damages in agriculture amounting to USD 2 billion in flood damages on over 1 million acres of standing crops. Trends also suggest that the impact is felt in the country's ability to meet the Millennium Development Goals by 2015.

The poor in rural and urban areas are disproportionately affected, with poverty and malnutrition serving as both drivers and consequences of inadequate livelihoods. The inability of families, communities and institutions to prevent, anticipate, absorb, accommodate or recover and adapt from crises and disasters in a timely, efficient and sustainable manner is at the crux of the resilience agenda. This includes protecting and improving food systems against threats that affect food and nutrition security, agriculture and food safety. Weaknesses in resilience can have devastating consequences, triggering a downward spiral - household livelihoods and national development gains that have taken years to build are compromised or at times shattered.

## Key challenges

Disaster risk and resilience received insufficient emphasis in the original MDG agenda, despite the close relationship between disaster impacts and sustainable development. Disaster risk reduction (linked to climate change adaptation) will require a more central consideration in a new post-2015 framework, if the objectives of sustainable development are to be achieved. Resilience is a pre-condition for sustainable development in general and more specifically for fighting poverty, hunger and malnutrition.

At the moment, the Hyogo Framework for Action (HFA) 2005-2015 provides a strategic and systematic approach to reducing vulnerabilities and risks to hazards, involving the identification of ways to build the resilience of nations and communities to disasters. In nearly 12 years, progress has been more qualitative than quantitative, but varies from one country to another. Overall, the main global achievement is the change of mind-sets from crisis management to risk reduction with an emphasis on prevention and preparedness.

The process to develop a successor arrangement to the HFA (informally referred to as HFA2) is already underway. The new instrument should i) build on the HFA ii) be coherent with the post-2015 development agenda and the 2015 climate change agreement iii) move from concept to local action - supported by strong national, regional and international planning frameworks, and iv) put a stronger emphasis on reaching the most vulnerable. The HFA2 can provide a clear framework to improve the linkages between humanitarian and development interventions to risk management, anchoring disaster risk reduction to key sectors such as agriculture, and addressing vulnerabilities beyond natural hazards such as transboundary plant pests and diseases, and food safety events.

## What needs to be done?

The next sustainable development framework should focus on inclusive and integrated cross-sectoral risk management approaches, and should target the most vulnerable communities and nations. To effectively address reducing risks of disasters and crises, the post-2015 agenda would need to:

- Promote coherence between risk-related interventions at global, regional, national and local levels;
- Bridge gaps between emergency humanitarian aid and long-term risk informed development and investment actions (including through multi-year programming and longer term funding horizons);
- Address the dual and inter-related challenges of climate change and disaster risk reduction in an integrated way, across all policies and sectors and strongly anchor them within sectoral perspectives (e.g. agriculture, fisheries, forestry etc.);
- Address vulnerabilities to threats and crises, addressing underlying causes of vulnerabilities, in conjunction with poverty, and marginalization/inequalities;
- Consider that beyond individual categories of disasters/shocks, understanding resilience requires a holistic analysis of the interactions between multiple and often cascading shocks and their economic, financial, social, political and environmental dimensions (in particular for natural disasters that occur in a context of protracted crises, violent conflict or post-crisis transition).



# Post-2015 and SDGs

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March 2014

### FAO AND THE POST-2015 DEVELOPMENT AGENDA ISSUE PAPERS



# 14

THEMES

## Highlights

- Social protection provides direct income support, with an immediate impact on food security and poverty reduction.
- Social protection supports farmers and other rural households in overcoming financial constraints and better managing risks, with positive impacts on food production and farm-level investment in agriculture.
- Social protection tends to stimulate the local economy, with positive effects on agricultural production, rural employment and poverty reduction.
- Social protection can promote sustainable food systems, natural resource management and resilient livelihoods.
- Social protection enhances the development of human capital with long-term beneficial impacts on livelihoods.

## Social protection

### Overview

Access to adequate social protection remains a privilege. Today, only a fifth of the world population enjoys sufficient social protection. An additional 30 percent is partially, but not sufficiently covered, leaving half of the world excluded. Traditional social security policies are a fundamental component of social protection, but the much higher degree of labour market informality in most developing countries, especially in the countryside, limits the potential coverage of contributory schemes in reaching the most vulnerable.

Most of the food insecure, undernourished, shock-prone and otherwise vulnerable populations lack social protection coverage. Only a small fraction of the 842 million people considered undernourished in the world have access to some form of social protection, including safety net programmes. Most of them live in rural areas and depend on agriculture. Rural women and youth, as well as migrants, tend to be over-represented among the poor and those lacking access to basic social services. Already disadvantaged in terms of employment opportunities and access to productive resources, they are particularly vulnerable.

Without access to instruments for risk-mitigation or risk-sharing, poor rural families are more likely to sell off their assets, shift to less risky, but lower yielding crops, or take their children out of school to work, which is likely to weaken future livelihood prospects.

Social protection has proven to be effective in reducing poverty and hunger, building resilience while promoting more inclusive and sustainable growth. Universal access to health care, education and income supplements

for the needy fosters healthier, more productive and more equitable societies.

With the necessary political will, social protection is financially affordable for all countries – high, middle and low-income – albeit with different levels of provisioning. Social transfer programmes that combine income support with better access to social services, particularly health and education, have greatly reduced malnutrition and enhanced income-generating capabilities. Last, but not least, social protection can transform societies by helping to empower previously marginalized groups.

## Key challenges

The main challenge for governments is to extend social protection to the most deprived and vulnerable people, especially in rural areas and the urban informal sector. Despite successful expansion of social protection programmes in a number of developing countries, basic social protection coverage remains a major challenge for others. Where social protection systems have been expanded successfully, this has come at relatively low cost. For instance, the cost of Brazil's successful *Bolsa Familia* programme amounts to less than one per cent of national income.

A further challenge is to overcome often fragmented delivery of social protection in isolation of other economic and social policies. Social protection is no panacea and its lasting developmental impact tends to be greater when aligned with broader developmental policies. To achieve such alignment, the potential synergies between social protection measures and development outcomes need to be carefully assessed. While the impact may vary in each context, in poor rural areas enhanced social protection has been found to:

- Help households to overcome dietary energy undernourishment by improving their access to food with particularly strong positive impacts from cash and in-kind transfer programmes on the nutritional well-being of children and women in poor households;
- Support farmers and other rural households in overcoming liquidity constraints and better manage risks with positive impacts on food production and farm level investment in agriculture;
- Leverage sizeable gains in access to health and education services, as measured by increases in school enrolment (particularly for girls), reduction in child labour and use of health services;

- Stimulate local economic development, for instance through the spending effects of cash transfers with positive feedbacks on agricultural production, employment and rural poverty reduction;
- Promote sustainable food systems and natural resource management: for instance, when social protection consists of public works programmes for land conservation and the building of terraces, improving water resource management and water harvesting, and afforestation/reforestation targeted at poor households.

Social protection interventions are an essential element of both aspects of FAO's "twin-track" approach to reducing hunger and poverty. Both short- and long-term interventions are required. Social protection can establish a bridge between the two tracks. First, it helps households to overcome undernourishment by providing them with direct access to food or means to buy food. Second, it can increase agricultural productivity growth, improve livelihoods and nutrition, and promote social inclusion.

## What needs to be done?

There is a clear need to forge links and promote greater policy coherence and synergies between social protection, food security, agricultural development and rural poverty reduction. To achieve their desired developmental impact, social policies will need to go hand-in-hand with agricultural and rural development policies. It is also crucial that different sectors of the government work together to deliver social protection successfully.

The Social Protection Floor approach provides a coherent and consistent policy framework which addresses multidimensional vulnerabilities in an integrated and interconnected way. National Social Protection Floors can combine basic income security guarantees with effective access to essential social services. This would enhance linkages and potential synergies across the economic, social and environmental dimensions of sustainable development.

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POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14**  
THEMES

## Highlights

- Climate change adds another challenge to food and agriculture systems. It poses a fundamental threat to global food security, sustainable development and poverty eradication.
- Agriculture, including the forestry and fisheries sectors, must adapt to the impacts of climate change and improve the resilience of rural production systems and value chains while managing a sustainable increase in its goods and services.
- While agriculture, forestry and fisheries do contribute to Greenhouse Gas (GHG) emissions, they also offer opportunities for climate change mitigation. When supported through appropriate incentive mechanisms, mitigation can work in synergy with adaptation, contributing substantially to rural development and environmental sustainability.
- Climate change must be addressed as an integral part of the overall development agenda to result in sustainable beneficial outcomes.

## Climate change

### Overview

Agriculture, forestry and fisheries face many challenges today. Agricultural production will have to increase globally by an estimated 60 percent by 2050, and to double in developing countries, to meet projected expanding demands for food and feed from a growing and changing world population. Many current production systems are already under stress through degradation of land and water resources and loss of biodiversity and ecosystem services resulting from unsustainable practices. These challenges will be exacerbated by projected climate change and an expected increase in extreme weather events. Production and livelihoods will be affected by, amongst others, high temperatures that exceed survival thresholds of crop, tree and fish species, increased ocean acidity and increased severity of extreme weather events. Without properly addressing these issues, we will not succeed in ensuring world food security, sustainable and equitable development and poverty eradication.

Climate change is expected to impact the agriculture, forestry and fisheries sectors in many different ways. While rising temperatures and the effects of CO<sub>2</sub> fertilization may benefit production in some regions, in the short term the overall consequences to yields are expected to be adverse. And it will be the most vulnerable – those with the least adaptive capacities, that will be affected the most. Agriculture, forestry and associated land use and land use change contribute to 20–30 percent of the total anthropogenic GHG emissions. In particular, agricultural expansion for crop or livestock production is a major cause of deforestation and peat land degradation, resulting in substantial losses of carbon stocks contained in these valuable ecosystems, as well as their genetic resources.

## Key challenges

Climate change represents a serious threat to global food security. It affects the four dimensions of food security: food availability, food accessibility, the stability of food supply, and the ability of consumers to adequately utilize food including food safety and nutrition. Agriculture and food systems must undergo fundamental transformations in order to meet the related challenges of global food security and climate change.

Adaptation of the agricultural, forestry and fisheries sectors, with a focus on improved resilience of production systems and the local communities depending upon them, is of paramount importance in coping with the expected changes in climatic conditions. These actions need to be developed in the context of the needed sustainable increase in agricultural production. More efficient resource use and harnessing of ecosystem services are crucial elements of this strategy. Agriculture, forestry and fisheries can, therefore, be a significant contributor to global mitigation efforts by reducing their carbon footprint through adoption of low emissions growth strategies and enhancing carbon storage in soils, forests and aquatic systems.

By 2080, climate change is likely to have these impacts:

- 75 percent of Africa's population could be at risk of hunger.
- 75 million hectares of land currently suitable for rainfed agriculture being lost in sub-Saharan Africa.
- Agricultural Gross Domestic Product (GDP) is projected to fall by up to 8 percent in sub-Saharan Africa and by 4 percent in Asia.
- Demand for irrigation will grow by 5 to 20 percent worldwide.

## What needs to be done?

Addressing climate change challenges requires coordination of a variety of approaches, often specific to certain sectors or practices and local conditions. FAO has developed and promotes a unified approach, known as Climate-smart agriculture (CSA), to developing the technical, policy and investment conditions to support its member countries achieve food security under climate change. CSA recognizes that action needs to be implemented alongside three interlinked pillars:

1. Sustainably increasing agricultural productivity and incomes;
2. Adapting and building resilience to climate change; and
3. Reducing and/or removing greenhouse gas emissions, where possible.

The CSA approach builds location-specific assessments of the potential food security, adaptation and mitigation benefits from agricultural technologies and practices to guide agricultural strategies. CSA explicitly links climate finance with traditional sources of agricultural finance by identifying adaptation and mitigation benefits and means of measuring, reporting and verifying their provision.

International governance is also a vital element in assuring appropriate action in the sectors related to designing and implementing climate change responses. The United Nations Framework Convention on Climate Change (UNFCCC) is the key policy forum for climate change-related issues. In 2015, a new international

The Inter-governmental Panel on Climate Change asserts that roughly 20 to 30 percent of species it has assessed are likely to be at an increasingly high risk of extinction as global mean temperature exceeds pre-industrial levels by 2 to 3 degrees centigrade.

climate regime is to be agreed upon under the UNFCCC to keep global warming below crucial levels. This agreement should address the concerns of developing countries, and in particular of least developed countries, regarding their needs to adapt to increasing

variability and expected climate change impacts on their agricultural sectors, while promoting their potential to contribute to the overall reduction of GHG emissions.



# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

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**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14  
THEMES**

### Highlights

- The critical role of biodiversity in sustainable development was recognized in the Rio+20 outcome document, *The Future We Want*.
- Biodiversity provides basic goods and services upon which food security and nutrition depend; it should be conserved and used sustainably.
- The diversity, richness and complexity of ecosystems, species and genetic resources are crucial for sustainable production, poverty eradication, sustainable economic development, hunger eradication, health and other global objectives.
- The conservation of biodiversity and of genetic resources for food and agriculture, and the maintenance and restoration of ecosystem functions and services should represent shared objectives for all sectors contributing to sustainable development, food security and better nutrition.
- Biodiversity related instruments developed within the agriculture sectors (including crop, livestock, forestry, fisheries and aquaculture) could play a key role in achieving biodiversity goals.

### Ecosystem services, biodiversity, genetic resources

#### Overview

Biodiversity<sup>1</sup> is key to food security and nutrition. Its genetic component provides the variation needed to increase food production, enhance its quality and adapt it to ever-changing environmental and socio-economic conditions. Biodiversity also provides essential services to production systems, while healthy ecosystems are resilient to stress and are crucial for coping with the effects of climate change.

Biodiversity is of high relevance to critical life issues such as hunger eradication, poverty reduction, health and sustainable economic development. Many economic sectors depend on biodiversity and ecosystem services, including agriculture, fisheries, forestry, health, nutrition, energy and tourism. The world's fisheries employ approximately 200 million people, and have a value estimated at USD 80 billion. Insects and other animals that transmit pollen, especially for fruits and vegetables, are estimated to be worth more than USD 200 billion per year to the global food economy.

<sup>1</sup> Biological diversity is defined as "the variability among living organisms[...]; this includes diversity within species, between species and of ecosystems" (Convention on Biological Diversity (CBD), Article 2)

## Key challenges

The expected growth of the human population, and the consequent need for additional food, feed and fibre, will put stronger pressure on the environment. A number of major drivers (e.g. land-use change and land degradation, unsustainable use of resources, pollution, invasive alien species, climate change and ocean acidification) are affecting biodiversity, reducing the number of species, impoverishing their genetic diversity and stressing ecosystems, often beyond their capacity.

Presently, humans use only a fraction of the existing biodiversity for food security and nutrition. For instance, of the 30 000 terrestrial plants known to be edible, just four of them – wheat, rice, maize and potatoes – provide 60 percent of the world population's energy intake. Aquatic species provide almost 20 percent of animal protein intake for about 3 billion people worldwide, yet in aquaculture 10 out of 600 farmed food fish and algae species account for half of the production. Using such a small number of species, often with a narrow genetic base, increases the vulnerability of agriculture systems and puts food security and nutrition at increasing risk.

Useful and nutritious varieties and breeds are being lost, or their genetic pool is being eroded, mainly caused by unsustainable use or, indeed, lack of use. Of the 8 300 livestock breeds known, eight percent are extinct and 22 percent are at risk of extinction. In the oceans, close to 30 percent of stocks are overfished.

There is still much that we do not know. Ongoing degradation is severely affecting forest genetic resources, threatening their existence even before their

potential use can be adequately investigated. Presently less than one percent of the 80 000 tree species in the world have been studied for their use in any depth. And the key contributions of micro-organisms and invertebrates to food security and nutrition are still too poorly known to be properly managed.

A large number of the world's population rely directly on biodiversity and ecosystem services, and it is their livelihoods that would be affected first and foremost by biodiversity loss. The impacts would be particularly severe for the poor and vulnerable, including women, children and indigenous people.

## What needs to be done?

Maintaining biodiversity is a global responsibility. The conservation, restoration and sustainable use of biodiversity can provide viable solutions to a range of societal challenges.

Global initiatives have been established addressing the conservation and sustainable use of biodiversity (including genetic resources for food and agriculture) and ecosystem services. With the declaration of the UN Decade on Biodiversity, the Strategic Plan for Biodiversity 2011–2020 and the Aichi Biodiversity Targets have been recognized as the UN-wide framework for addressing issues related to biodiversity at ecosystem, species and genetic levels.

In addition, a number of biodiversity-related instruments have been developed in the various sectors of agriculture, including crops, livestock, forestry, fisheries and aquaculture. Their implementation needs to be strengthened, including via integration into National Biodiversity Strategies and Action Plans.

To facilitate the implementation of these instruments at national level, more investments at different levels are needed. The conservation of biodiversity and of genetic resources for food and agriculture, and the maintenance and restoration of ecosystem functions and services, should represent shared objectives in all sectors contributing to sustainable development, food security and nutrition.

# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14  
THEMES**

## Highlights

- Energy is central to sustainable development. It accelerates social and economic progress and enhances productivity.
- Energy is closely linked to food security and poverty eradication. Lack of energy is a fundamental barrier to eradicating hunger and malnutrition and combating poverty.
- Food systems will gradually have to decouple from fossil fuel dependence so that they can deliver more and better food with less and better energy.
- Achieving the transformation to energy-smart food systems will require a systemic perspective, better policymaking coordination, appropriate legal frameworks and a comprehensive multi-stakeholder dialogue and global partnership to support action.
- The FAO multi-partner programme "Energy-Smart Food for People and Climate" seeks to support stakeholders in improving energy efficiency, increasing the use of renewable energy, and improving access to modern energy services in food systems.

## Energy

### Overview

The UN General Assembly declared 2012 as the "International Year of Sustainable Energy for All" and 2014-2024 the "Decade of Sustainable Energy for All". This is highly relevant to food security. Energy has a key enabling role in achieving food security and better nutrition. It is essential for efficient and more inclusive food chains, allowing higher outputs. Energy prices affect agricultural inputs and the cost of production, and hence influence food prices.

Current energy use in food systems is unsustainable:

- Food systems currently consume 30 percent of the world's available energy, with more than 70 percent occurring beyond the farmgate, and produce over 20 percent of the world's greenhouse gas emissions (around 31 percent if land-use change is included);
- At the same time, about one-third of the food we produce is lost or wasted, and with it about 38 percent of energy consumed in food systems;
- Modern food systems are heavily dependent on fossil fuels. Currently, 85 percent of total primary energy is fossil fuel based;
- Nearly one in five people around the world do not currently have access to modern energy services, and approximately three billion rely on traditional biomass for cooking and heating. This use of biomass for energy is often unsustainable with serious adverse consequences for health, the environment and economic development;
- Finally, in the next decades there will be significant and simultaneous increases in water, energy and food needs to be met by a degraded and depleted natural resource base.

Renewable energy holds potential for addressing the sustainable energy challenges. Bioenergy, in particular, has been promoted as a means to improving energy security and energy access, and, possibly, mitigating climate change. Bioenergy is all energy derived from biofuels, which are fuels derived from biomass. They come in liquid, gaseous and solid form and can be used for heating and cooking, electricity production and as transport fuels. Biofuels are linked to all four dimensions of food security – availability, access, stability and utilization of food. Compared to other energy sources, bioenergy has the potential to offer poor countries many advantages including renewed investment in the agriculture sector, economic growth, increased energy security and access, rural development opportunities and reduced GHG emissions. However, to develop the full potential of the bioenergy sector, growth in bioenergy has to be managed in an economically, socially and environmentally sustainable way.

## Key challenges

The main challenge areas in the interface between [energy](#) and [agriculture](#) include:

- *Sustainable bioenergy*: This complex subject can be approached using the FAO sustainable bioenergy [decision-support package](#), which includes various tools for situation analysis, implementation, and monitoring and evaluation;
- *Energy for sustainable intensification of agricultural production*: Knowledge has been gained over decades on the adoption of agro-ecological practices that produce more and better food with less and better energy;
- *Renewable energy technologies for reducing post-harvest food losses and adding value*: Numerous technologies such as solar crop driers and refrigerators can increase smallholder income (and its diversity) and resource efficiency;
- *Access to clean cooking fuel and technologies*: There is scope to build on guidelines for increasing the sustainability of charcoal production, and for reducing fuelwood and charcoal consumption by enhancing access to clean cookstoves.

The challenges facing the energy sector are interlinked and therefore require an integrated or “nexus” approach.

## What needs to be done?

Modernizing food and agriculture systems by increasing the use of fossil fuels, as in the past, may not be an affordable

or sustainable option because of climate change and the influence of high and volatile fossil fuel prices on the cost of production and food prices. As a result, due consideration to energy and its links with water and food production and future use in agriculture development is crucial. In particular, the agri-food value chain will have to become gradually decoupled from fossil fuel dependence so that it can deliver more food with less and cleaner energy.

Priorities for the way ahead should include:

- Addressing the challenges of meeting the need for significant and simultaneous increases in water, energy and food in a context of climate change and stressed natural resources;
- Supporting countries in the design and implementation of sustainable bioenergy policies and strategies that foster both food and energy security, and agricultural and rural development in a climate-smart way;
- Supporting farmers learn the agro-ecological approach, adapt it to their local conditions and disseminate suitable practices through farmer field schools and other networks and movements;
- Scaling up small-scale decentralized renewable energy systems on farms and in rural areas;
- Reducing food losses (particularly in developing countries), partly through improved access to post-harvest technologies; and reducing waste (particularly in developed countries) through consumer education;
- Improving access to energy through sustainable biomass production, higher transformation efficiency of biomass to bioenergy and introduction of culturally acceptable and clean cookstoves.

Achieving the above will need inclusive multi-stakeholder, cross-sectoral partnerships, better governance and increased financing and technology-sharing to bridge the transition to sustainable food and energy systems. The FAO multi-partner programme “[Energy-Smart Food for People and Climate](#)” addresses the above challenges. This programme can make a major contribution to sustainable development, an inclusive green economy and the [Sustainable Energy For All \(SE4All\)](#) initiative by achieving the following objectives at all stages of the food chain:

- Improving energy efficiency;
- Increasing the use of renewable energy;
- Improving access to modern energy services through integrated food and energy production.



# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

### FAO AND THE POST-2015 DEVELOPMENT AGENDA ISSUE PAPERS



14  
THEMES

## Highlights

- Oceans, seas and coastal areas provide mankind with manifold goods and ecosystem services fundamental to human well-being, global food security and nutrition. They form an integrated and essential component of the Earth's ecosystem and are critical to sustainable development.
- Fisheries and aquaculture offer ample opportunities to reduce hunger and improve nutrition, alleviate poverty, generate economic growth and ensure better use of natural resources.
- If the current trend in unsustainable uses of marine resources is not reversed, the ability of our oceans to deliver food for future generations will be severely compromised.
- Curbing overfishing while promoting responsible and sustainable fisheries and aquaculture practices and preserving healthy marine environments are among humankind's best opportunities to deliver highly nutritious food to a growing population.
- Investing in Blue Growth - the sustainable management and use of aquatic resources and adoption of ecosystem approaches - can boost economic growth, increase food security, improve nutrition and reduce poverty.
- The FAO Code of Conduct for Responsible Fisheries provides principles for promoting sustainable fisheries and aquaculture.

## Fisheries, aquaculture, oceans and seas

### Overview

The planet's oceans, seas and coastal areas provide manifold goods and ecosystem services that are fundamental to human well-being, global food security and nutrition, international trade and economic development, climate regulation, storm protection, energy generation, waste absorption and recycling, recreation, and others. Coastal areas are home to a large percentage of the world's population and often depict above average rates of urbanization, economic development and population growth.

Fisheries and aquaculture are a vital source of nutritious food and protein for billions - worldwide nearly 3 billion people receive 20 percent of their daily animal protein intake from fish. Employment in fisheries and aquaculture has continued to grow faster than in agriculture - providing about 55 million jobs worldwide. Including ancillary activities (e.g. processing and packaging) and dependants, these sectors support the livelihoods of 10-12 percent of the world's population.

- 40 percent of the world's population is estimated to live within 100 km of the shore line.
- Every day capture fisheries and aquaculture harvest more than 400 000 tonnes of fish.

### Key challenges

The bulk of capture fisheries production comes from coastal waters, where both the productivity and quality of fish stocks are severely affected by pollution.

Fisheries and aquaculture supplied the world with 157 million tonnes of fish in 2012 (with a total export value of USD 130 billion), of which over 130 million tonnes was used as food for people. With sustained growth in fish production and improved distribution channels, world fish food supply has grown dramatically in the last five decades, with an average growth rate of 3.2 percent per year in the period 1961–2009, outpacing the increase of 1.7 percent per year in the world's population. World per capita food fish supply increased from an average of 9.9 kg in the 1960s to some 19 kg in 2011. Fish imports rose by 108 percent from 2002–2012 with developing countries representing 54 percent in total fishery exports by value. Aquaculture, the world's fastest growing food production sector, will continue to expand. Total fish supply is projected to increase to 186 million tonnes in 2030 with fisheries and aquaculture contributing equal amounts. However, aquaculture is expected to provide close to two thirds of global food fish.

Capture fisheries and aquaculture are also threatened by competing demands from hydropower development and water diversion for industrial use. Furthermore, the vital contributions of fisheries and aquaculture to the world's well-being and prosperity remain constrained by poor governance, management and practices. Illegal, Unreported and Unregulated (IUU) Fishing continues to be an obstacle to achieving sustainable fisheries. Climate change is adding a further challenge.

Stresses caused by human activity on the oceans' life support systems are widely acknowledged to have reached unsustainable levels. Today, 50 percent of fish stocks worldwide are fully exploited, 30 percent are overexploited, with 90 percent of large predatory fish stocks already depleted. Our oceans and seas are under risk of irreversible damage to habitats, ecological functions, and biodiversity because of overfishing, climate change and ocean acidification, pollution, unsustainable coastal area development and the unwanted impacts from the extraction of non-living ocean resources.

If the current trend in unsustainable uses of marine resources is not reversed, their ability to deliver food

for future generations will be severely compromised. At risk are hundreds of millions of people who depend on fisheries and aquaculture for their livelihoods, food security and nutrition, with small-scale coastal fishing communities particularly affected.

Fleet overcapacities result in large economic losses - estimated at USD 50 billion/year - through inefficient utilization of resources that otherwise could support economic development and growth.

## What needs to be done?

The Rio+20 outcome document 'The Future We Want' stresses the need to reverse these trends by utilising the oceans' vast potential wealth wisely and reducing its vulnerability to ocean-related hazards. Putting the uses of oceans and seas onto a sustainable path and adapting to climate change requires concerted and responsible actions across a wide range of actors and economic sectors.

Promoting sustainable fishing and fish farming practices and strengthening fisheries management capacity can ensure the conservation and sustainable use of the oceans and seas and of their resources. Enabling mechanisms include the adoption of an ecosystem approach to fisheries and aquaculture with fair and responsible tenure systems.

Investing in Blue Growth - the sustainable management and use of aquatic resources and adoption of ecosystem approaches - can boost economic growth, increase food security, improve nutrition and reduce poverty - and is of particular significance to Small Island Developing States (SIDS) and coastal areas around the globe.

Today there is an increasing need for cooperation and coordination among all stakeholders and at all levels for more sustainable fisheries management and better conservation. Further capacity development efforts are needed, in particular those strengthening the policy environment, institutional arrangements as well as collaborative processes that empower fishing communities, civil society organizations and public entities. The 1995 FAO [Code of Conduct for Responsible Fisheries](#) - and its associated guidelines - provides the principles and framework for promoting responsible and sustainable fisheries and aquaculture.

# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14  
THEMES**

## Highlights

- Forests make vital contributions to biodiversity and provide myriad environmental goods and services. They sustain a range of industries, generate jobs and income and act as a source of food, medicine and fuel for more than a billion people. But today forests face unprecedented and unrelenting pressures.
- Forests and forest land currently retain as much carbon as in the whole atmosphere. Conserving and enhancing forests are a prerequisite – and one of the most appropriate measures – to address climate change.
- Mountains are the major storehouses of the freshwater that sustains life on Earth. Virtually a quarter of the world's forests are in mountain areas. Yet, despite their immense ecological and socio-economic value, mountains are being subjected to increasing pressure by human activities and climate change.
- Mountain people and forest dependent local communities are usually among the world's poorest and most hungry. More efforts are required by States to adopt and implement long-term and integrated approaches that include forest and mountain-specific policies into national sustainable development strategies.

## Forests and mountains

### Overview

Forests cover 31 percent of global land area and alone they contain over 80 percent of the world's terrestrial biodiversity. They make a direct and very tangible contribution to global food security, and provide a range of goods and services that include acting as a source of renewable energy, and playing an irreplaceable role in climate change adaptation and mitigation:

- Three quarters of the freshwater used for household, agricultural and industrial needs is provided through forested watersheds;
- An estimated 2.6 billion people worldwide are dependent on wood fuel, including charcoal, for cooking and heating;
- Between 65 and 80 percent of the global population rely on naturopathic or homeopathic medicines derived from forests as their primary form of health care.

The contribution of the formal forest sector to the global Gross Domestic Product (GDP) is estimated at nearly USD 468 billion annually. The value of other benefits from forests - through the provision of energy, food, fodder, shelter and medicine - is estimated to be two to three times greater than this, yet often is not taken into account in economic decision-making and national statistics. Indeed, forests provide indirect yet reliable pathways out of poverty, particularly for the more vulnerable people such as indigenous communities and women.

Equally important for livelihoods and for environmental products and services, mountains cover 27 percent of Earth's land surface and are home

to 12 percent of the human population. They have immense ecological and socio-economic significance, not only for the people living there, but also for those living in lowland areas. Mountains hold 23 percent of the Earth's forest cover and are a particularly important source of water, energy, timber, plant genetic resources of major food crops, minerals and recreation. They harbour nearly one third of global terrestrial biodiversity and diverse ecosystems. Globally, mountains provide 60 to 80 percent of the world's freshwater.

## Key challenges

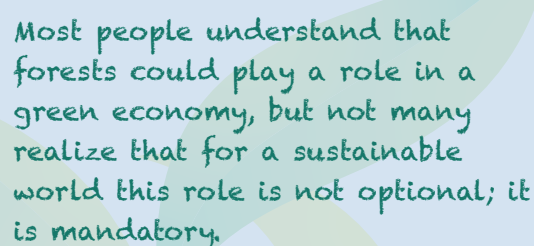
Despite their multiple benefits, forests are under severe threat. Each year between 2000 and 2010, around 13 million hectares of forests were converted to other land uses or lost through natural causes. While afforestation and natural expansion of forests reduced the net loss of forests globally, this remained alarmingly high at about 5.2 million hectares per year in this same period. Deforestation results not only in a decrease in biodiversity and clean water, increased land degradation and soil erosion and the release of carbon into the atmosphere, but also in the loss of valuable economic assets and livelihood opportunities.

Ecosystems in mountain areas are more fragile than those in lowlands. The increasing demand for water and other natural resources, the consequences of global climate change, the growth in tourism and the pressures of industry, mining and agriculture, all threaten the extraordinary web of life that mountains support and the globally important environmental services that mountains provide. These threats are causing rapid – and in some cases irreversible – changes to mountain environments and to mountain people, who are already among the world's poorest and most vulnerable.

National development plans and agricultural and food security strategies often fail to take into account the many contributions of forests and mountains to agricultural development, food security and nutrition and overall economic growth. This is mainly because of the lack of knowledge and data to support and inform effective policy-making processes on the role of non-wood forest products, mountains, wildlife and forest ecosystem services in food security, nutrition and sustainable livelihoods.

## What needs to be done?

Greater understanding of forests' and mountains' interconnectedness with other sectors and their importance to a healthy planet has led to concepts like Sustainable Forest Management, which aims at maintaining and enhancing the economic, social and environmental values of all types of forests for the benefit of current and future generations. Sustainable forest management is assessed according to a wide range of criteria and indicators. At all levels, inclusive governance approaches, where all relevant stakeholders and actors participate in the decision-making processes to ensure that outcomes are fair, equitable and implementable, are crucial. Broadening and diversifying the range of revenues for and from forests is critical to sustainable forest management.



*Most people understand that forests could play a role in a green economy, but not many realize that for a sustainable world this role is not optional; it is mandatory.*

More efforts are required by countries to adopt and implement long-term and integrated approaches that include forest and mountain-specific policies into national sustainable development strategies to provide an urgent response to current challenges, including climate change, hunger and poverty eradication. These approaches should be informed by principles of transboundary cooperation, upstream-downstream linkages, inclusive governance and institutions, compensation of local people for ecosystem goods and services, and a balance between conservation and development actions.

Forest and mountain countries recognize that, thanks to their crucial importance for global sustainable development and the serious challenges being faced, forests and mountains deserve specific attention in development plans and strategies at all levels – global, regional and national.



# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14  
THEMES**

## Highlights

- Land and soils constitute the foundation for sustainable agricultural development, essential ecosystem functions and food security. They are key to sustaining life on Earth.
- Soil is non-renewable - its loss is not recoverable within a human lifespan - yet it is the most overlooked natural resource.
- Soil degradation is a real and escalating threat caused by unsustainable land uses and management practices, and climate extremes that result from various social, economic and governance drivers.
- The current rate of soil degradation threatens the capacity of future generations to meet their needs. This trend can be reversed through a concerted effort towards its sustainable management.
- As soils are at risk, this compromises sustainable agriculture, food security and the provision of ecosystem services.

## Land and soils

### Overview

Soil is a core component of land resources and the foundation of agricultural development and ecological sustainability. It is the basis for food, feed, fuel and fibre production and for many critical ecological services. Soil is a complex, dynamic living system and its suitability varies from place to place. The area of productive soil is limited and is under increasing pressure of intensification and competing uses for cropping, forestry and pasture/rangeland, and to satisfy demands of the growing population for food and energy production, raw materials extraction, and so forth.

- Soil is a reservoir for at least a quarter of global biodiversity and therefore requires the same attention as above ground biodiversity;
- Functional soils play a key role in the supply of clean water and resilience to flood and drought;
- Plant and animal life depend on primary nutrient cycling through soil processes. Efficient soils provide the largest store of terrestrial carbon; their preservation may contribute to climate change mitigation;
- Soils also serve as a platform and source for construction and raw material. Soils have a role in achieving integrated production systems and helping to address the food, water, and energy nexus;
- Soils are both affected by, and may contribute to, climate change. Sustainable management of soil resources contributes effectively to mitigation of (i) climate change through carbon sequestration and reduction of greenhouse gas emissions, and (ii) desertification processes;

- Soils need to be recognized and valued not only for their productive capacities but also for their contribution to the maintenance of key ecosystem services.

## Key challenges

Sustainable management of the world's agricultural soils and sustainable production intensification have become an imperative for global food security. Current demographic trends and projected growth in global population (to exceed 9 billion by 2050) are estimated to result in a 60 percent increase in demand for food, feed and fibre by 2050. There is little scope for expansion in the agricultural area, except in some parts of Africa and South America. Much of the additional available land is not suitable for agriculture, and the ecological, social and economic costs of bringing it into production will be very high. In addition, 33 percent of land is moderately to highly degraded due to the erosion, salinization, compaction and chemical pollution of soils.

These dual objectives cannot be attained satisfactorily unless soils are placed at the very top of the new development agenda. There are well recognized links between soils and poverty, which are often associated with socio-economic and governance issues.

Land degradation and soil depletion represent a real and escalating global threat and involve a number of processes, including: erosion by wind, water and tillage, compaction, sealing, nutrient imbalance, loss of soil organic matter, acidification, salinization and pollution. These processes are caused by unsustainable land management practices that result from various social, economic and governance drivers. The resulting damage to soil affects livelihoods, ecosystem functions, food security and human well-being. The current rate of land and soil degradation will certainly compromise the capacity of future generations to meet their basic needs, unless we adopt a new approach for its sustainable management.

## What needs to be done?

The sustainable use and management of land and soils is linked to many different areas of sustainable development. There is an urgent need to stop land degradation and soil nutrient depletion and establish

frameworks for sustainable land and soil management systems.

Promoting the sustainable management of land and soils can contribute to healthy soils and thus to the effort of eradicating hunger and food insecurity and to stable ecosystems.

The Intergovernmental Technical Panel on Soils recommends the following actions:

- Suitable technologies, sustainable and inclusive politics, effective extension programmes and sound education systems need to be provided so that more is produced with less;
- Soil protection and reclamation and sustainable land management projects should be included in the current emerging markets that provide an economic value to those actions that produce ecosystem services. Governments have to recognize the increasing need to preserve soils and make corresponding investments;
- Promote management practices for climate change adaptation and mitigation, and resilience to changing weather patterns and extremes. Protection and management of organic carbon rich soils, notably peatlands and permafrost areas are of particular concern;
- Strong regulations and effective control by governments should be put in place in order to limit the accumulation of contaminants beyond established thresholds for human health and wellbeing and eventually to remediate contaminated soils;
- Increase the area under sustainable soil management practices, enhance the restoration of degraded soils, and promote sustainable production intensification through adapted biological resources, increasing soil fertility, water use efficiency, ensuring sustainable use of inputs and recycling of agricultural by-products;
- Support the development of national soil information systems to assist decision-making on sustainable land and natural resources uses; and increase investment in sustainable soil management through overcoming obstacles including tenure security and user rights, access to knowledge and financial services;
- Strengthen the implementation of capacity development and education programmes on sustainable soil management.

# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14  
THEMES**

## Highlights

- Production systems and the policies and institutions that underpin global food security are increasingly inadequate.
- Sustainable agriculture must nurture healthy ecosystems and support the sustainable management of land, water and natural resources, while ensuring world food security.
- To be sustainable, agriculture must meet the needs of present and future generations for its products and services, while ensuring profitability, environmental health and social and economic equity.
- The global transition to sustainable food and agriculture will require major improvements in the efficiency of resource use, in environmental protection and in systems resilience.
- Sustainable agriculture requires a system of global governance that promotes food security concerns in trade regimes and trade policies, and revisits agricultural policies to promote local and regional agricultural markets.

## Sustainable agriculture

### Overview

Persistently high levels of hunger and malnutrition – 842 million chronically hungry people in the world in 2011–2013 – and unsustainable human activity on the earth's carrying capacity present a major challenge for agriculture. To meet the growing food demand of the over nine billion people who will exist by 2050 and the expected dietary changes, agriculture will need to produce 60 percent more food globally and 100 percent more in the developing countries. At the same time, roughly one-third of food produced – 1.3 billion tonnes per year – is lost or wasted globally throughout the supply chain, with enormous financial and environmental costs.

A striking link exists between growth in agriculture and the eradication of hunger and poverty. Agriculture broadly understood – crop and livestock production, fisheries, and forestry – provides income, jobs, food and other goods and services for the majority of people now living in poverty. As a result, overall GDP growth originating in agriculture is, on average, at least twice as effective in reducing poverty as growth generated in non-agriculture sectors, and up to five times more effective than other sectors in resource-poor low-income countries.

### Key challenges

The current trajectory of growth in agricultural production is unsustainable because of its negative impacts on natural resources and the environment. One-third of farm land is degraded, up to 75 percent of crop genetic diversity

has been lost and 22 percent of animal breeds are at risk. More than half of fish stocks are fully exploited and, over the past decade, some 13 million hectares of forests a year were converted into other land uses.

The overarching challenges being faced are the growing scarcity and fast degradation of natural resources, at a time when the demand for food, feed, fibre and goods and services from agriculture (including crops, livestock, forestry, fisheries and aquaculture) is increasing rapidly. Some of the highest population growth is predicted in areas which are dependent on agriculture and already have high rates of food insecurity. Additional factors - many interrelated - complicate the situation:

- Competition over natural resources will continue to intensify. This may come from urban expansion, competition among various agricultural sectors, expansion of agriculture at the expense of forests, industrial use of water, or recreational use of land. In many places this is leading to exclusion of traditional users from access to resources and markets;
- While agriculture is a major contributor to climate change, it is also a victim of its effects. Climate change reduces the resilience of production systems and contributes to natural resource degradation. Temperature increases, modified precipitation regimes and extreme weather events are expected to become significantly more severe in the future;
- Increasing movement of people and goods, environmental changes, and changes in production practices give rise to new threats from diseases (such as highly pathogenic avian influenza) or invasive species (such as tephritid fruit flies), which can affect food safety, human health and the effectiveness and sustainability of production systems. Threats are compounded by inadequate policies and technical capacities, which can put whole food chains at risk;
- The policy agenda and mechanisms for production and resource conservation are mostly disjointed. There is no clear integrated management of ecosystems and/or landscapes.

## What needs to be done?

The challenges outlined above give rise to five key principles for guiding the strategic development of new approaches and the transition to sustainability:

- Principle 1: Improving efficiency in the use of resources is crucial to sustainable agriculture;
- Principle 2: Sustainability requires direct action to conserve, protect and enhance natural resources;
- Principle 3: Agriculture that fails to protect and improve rural livelihoods and social well-being is unsustainable;
- Principle 4: Sustainable agriculture must enhance the resilience of people, communities and ecosystems, especially to climate change and market volatility;
- Principle 5: Good governance is essential for the sustainability of both the natural and human systems.

In order to cope with the rapid pace of change and increased uncertainty, sustainability must be seen as a process, rather than a singularly defined end point to be achieved. This, in turn, requires the development of technical, policy, governance and financing frameworks that support agricultural producers and resource managers engaged in a dynamic process of innovation. In particular:

- Policies and institutions are needed that provide incentives for the adoption of sustainable practices, to impose regulations and costs for actions that deplete or degrade natural resources, and to facilitate access to the knowledge and resources required;
- Sustainable agricultural practices must make full use of technology, research and development, though with much greater integration of local knowledge than in the past. This will require new and more robust partnerships between technical and investment-oriented organizations;
- Evidence-based planning and management of the agricultural sectors requires suitable statistics, geospatial information and maps, qualitative information and knowledge. Analysis should focus on both production systems and the underlying natural and socio-economic resources;
- The challenges relating to stocks and utilization rates of natural resources often transcend national boundaries. International governance mechanisms and processes must support sustainable growth (and the equitable sharing of benefits) in all agriculture sectors, protecting natural resources and discouraging collateral damage.



# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

**FAO AND THE  
POST-2015  
DEVELOPMENT AGENDA  
ISSUE PAPERS**



**14**  
THEMES

## Highlights

- The eradication of hunger and poverty and the sustainable use of natural resources depend in large part on how people, communities and others gain access to land, fisheries and forests. Access to natural resources is defined and regulated by tenure rights.
- Secure tenure rights are crucial for the eradication of hunger and poverty, environmental sustainability and the promotion of responsible investments. Inadequate and insecure tenure rights to natural resources often result in extreme poverty and hunger.
- Pressure on land and other natural resources and tension over tenure arrangements are increasing as new areas are cultivated to provide food, feed and fibre for a rapidly growing world population.
- Responsible governance of tenure is a fundamental factor in improving tenure conditions. The Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security is an essential mechanism in the fight against hunger and malnutrition.

## Tenure rights

### Overview

Tenure rights represent the recognition by society that specific people, as individuals or groups, are entitled to use or control particular natural resources in certain ways. They range from ownership to rights often used for subsistence by the poor, such as rights to gather firewood or to forage tree crop plants. As the rules of tenure tend to develop in ways that establish power relations in a society, the more vulnerable members and groups tend to hold weaker and more insecure forms of tenure rights. Tenure arrangements also reflect the distribution of power within households, which often results in discrimination against women.

The livelihoods of many of the poor are diversified and are often dependent on access to different natural resources. Today, the agriculture, forestry and fisheries sectors employ one billion people, and the food sector provides direct and indirect livelihoods to 2.6 billion. Land is usually the most important asset, given that most rural households depend on agriculture for their livelihoods.

A crucial element is the governance of tenure. This determines if and how people, communities and others are able to acquire rights and associated duties to use and control land, fisheries and forests. In fact, many tenure problems arise because of weak governance, and attempts to address tenure problems are affected by the quality of governance.

## Key challenges

Weak governance of tenure hinders economic growth, social stability and the sustainable use of natural resources and the environment. People can be condemned to a life of hunger and poverty if they lose their tenure rights to their homes, land, fisheries and forests because of corrupt tenure practices or if administrative agencies fail to protect their tenure rights. People may even lose their lives when weak tenure governance leads to violent conflicts.

Tenure reforms are frequently needed to improve tenure arrangements. In the past few decades, land reforms have contributed to reducing gross inequality of access to rural land rights. As a result, some 1.5 billion people are less poor and many have improved security of tenure and strengthened tenure rights. Despite this, poor and vulnerable people around the world continue to have limited access to natural resources upon which their livelihoods depend.

The conditions of tenure affect how farmers and others decide to use land and whether they will invest in improvements:

- Inappropriate tenure policies and inequitable access can result in over-cultivation and over-grazing of marginal lands. Tenure reforms can promote land use practices that enhance the management and sustainability of natural resources;
- Farmers are more likely to invest in improving their land through soil protection measures, planting trees and improving pastures if they have secure tenure rights and can expect to benefit from their investments over the longer term;
- Women make essential contributions to agriculture; yet across all developing regions, women consistently have tenure rights that are often less secure, more limited or are gained through others, such as male family members.

## What needs to be done?

The “[Voluntary Guidelines on Responsible Governance of Tenure of Land, Fisheries, and Forests in the Context of National Food Security](#)” endorsed by the Committee on World Food Security (CFS) in May 2012, is the first comprehensive intergovernmental global instrument on tenure and its administration. The purpose of these Voluntary Guidelines is to serve as a reference and to provide guidance for improving “the governance of tenure of land, fisheries and forests with the overarching goal of achieving food security for all and to support the progressive realization of the right to adequate food in the context of national food security.”

The Guidelines offer a framework that Members can use when developing their own strategies, policies, legislation, programmes and activities. They allow governments, civil society, the private sector and citizens to judge whether their proposed actions, and the actions of others, constitute acceptable practices.

The Voluntary Guidelines were initiated by FAO and finalized through consultative and inclusive inter-governmental negotiations under the auspices of the CFS, and with the participation of civil society and the private sector. Implementation of the Guidelines has been encouraged at the Rio+20 UN Conference on Sustainable Development in June 2012, by the UN General Assembly, the G20 and the G8, the *Assemblée parlementaire de la Francophonie* and at the Berlin Agriculture Ministers’ Summit.

FAO has established an implementation programme at global, regional and country levels which is supported through voluntary contributions from its resource partners. However, successful implementation of the Voluntary Guidelines will need the participation of all stakeholders (governments and their technical agencies, civil society, private sector including investors and professional organizations, universities and research institutes, international financial institutions, regional organizations, UN and its agencies, and resource partners). This will require strengthened cooperation and partnerships between these various actors.

# Post-2015 and SDGs



## Nourishing people, Nurturing the planet

March 2014

### FAO AND THE POST-2015 DEVELOPMENT AGENDA ISSUE PAPERS



14  
THEMES

## Highlights

- Water is a key determinant in all aspects of social, economic and environmental development and should therefore be a central focus of any post-2015 framework for poverty eradication, food security, resilience to natural and human-induced disasters, and global sustainable development.
- Water cuts across all sectors and boundaries and is affected by a number of externalities such as economic development, changing lifestyles and consumption patterns, an increasing and mobile global population, climate change, and technological and social changes. Leaders need to make water an integral part of their decision-making processes.
- Safe drinking water, sanitation and hygiene, the sustainable management and development of water resources and the protection of aquatic biological resources, wastewater management and water quality are all indispensable elements for building a water-secure world.
- Water-related capacity development, both at the individual and institutional levels, is essential for realizing and implementing the Post-2015 Development Agenda.

## Water

### Overview

It is increasingly evident that the current use, development and management of the planet's water resources and the services they provide are unsustainable. Water use has been growing at more than twice the rate of population increase in the last century, and an increasing number of regions are chronically short of water.

- Between 1990 and 2010, more than 2 billion people gained access to basic drinking water, but 780 million people still remain without it and many more remain without safe and sustainable sanitation;
- Over 1.7 billion people live today in river basins where water use exceeds recharge, leading to the desiccation of rivers and depletion of groundwater;
- As countries develop and populations grow and urbanize, their demand for water is projected to increase by 55 percent by 2050;
- Two-thirds of the world's population could be living in water-stressed countries by 2025 if current consumption patterns continue.

At the same time, climate change and the degradation of ecosystems due to human activity are expected to further exacerbate extreme events such as floods and droughts. These trends will add further stress on an already difficult situation, increasing the risk of conflicts over water.

To sustainably achieve poverty eradication, food security, and resilience to natural and human-induced disasters, water productivity needs to be

enhanced, appropriate infrastructure developed, an integrated approach to water resources management implemented, water governance systems improved at all levels and the ability of ecosystems to support sustainable water management, including the aquatic biological resources that are dependent on water, protected and restored. Examples of the positive impact of water on economic growth and poverty reduction include irrigation, fisheries, aquaculture, and hydropower as well as flood management. Water abstraction for irrigation and food production constitutes one of the greatest pressures on freshwater resources. Agricultural water withdrawal accounts for 44 percent of total water withdrawal in OECD countries, 74 percent in the BRICs and over 90 percent in the least developed countries. With global population growth driving food demand up by 60 percent by 2050, more water will be needed for irrigation, in particular in regions already suffering from water scarcity.

## Key challenges

While the MDG drinking water target has already been achieved, the current MDG framework did not adequately address the broader water agenda, including inter-sectoral competition, wastewater management, living aquatic resources and issues of water quality. Recent results from a survey of 130 countries show that there has been widespread adoption of integrated approaches to water management worldwide, but that these approaches find difficulties in their application on the ground.

Progress towards improved water governance and efficient water use has been uneven across countries and regions, constrained by limited implementation capacity and stakeholder participation as well as by suboptimal institutional arrangements. This has resulted in significant challenges where irrigation, rainwater harvesting and investment in freshwater ecosystem services are concerned, with direct impacts on food production and food security. In some regions of the world, the productive potential of water resources remains untapped due to lack of focused investment, as in Sub-Saharan Africa. Water-related disasters can cause losses of up to 14 percent of GDP due to a lack of storage and regulating capability.

## What needs to be done?

Improved knowledge, research, innovation and implementation towards more productive and sustainable use of water, especially for food and energy, will be required to meet the world's future fuel and food needs. Data and information, updated on a regular basis, about the current status, trends and prospects of water resources and their use are prerequisites for informed decision-making. Through a better combination of technical solutions, improved cross-sectoral approaches and political commitment to sustainably meet competing needs of multiple users, wise water management offers enhanced livelihoods - job creation, a safer environment, and better overall health and well-being.

At the same time, there is a pressing need to improve global freshwater quality by addressing water pollution and making better use of wastewater. It has been estimated that about 80 percent of wastewater from human settlements and industrial sources worldwide is discharged directly untreated into water bodies, with detrimental effects on human health and the environment. Improving the quality of the world's water resources requires pollution reduction by treating and recycling contaminated water and protecting the ability of ecosystems to regulate water quality.

*There is an increasing need for transparent and effective governance mechanisms to allocate water among competing demands. A truly water-secure world can only be achieved through cross-sectoral water cooperation at local, national, regional and global level and through an inclusive process engaging with all concerned stakeholders.*