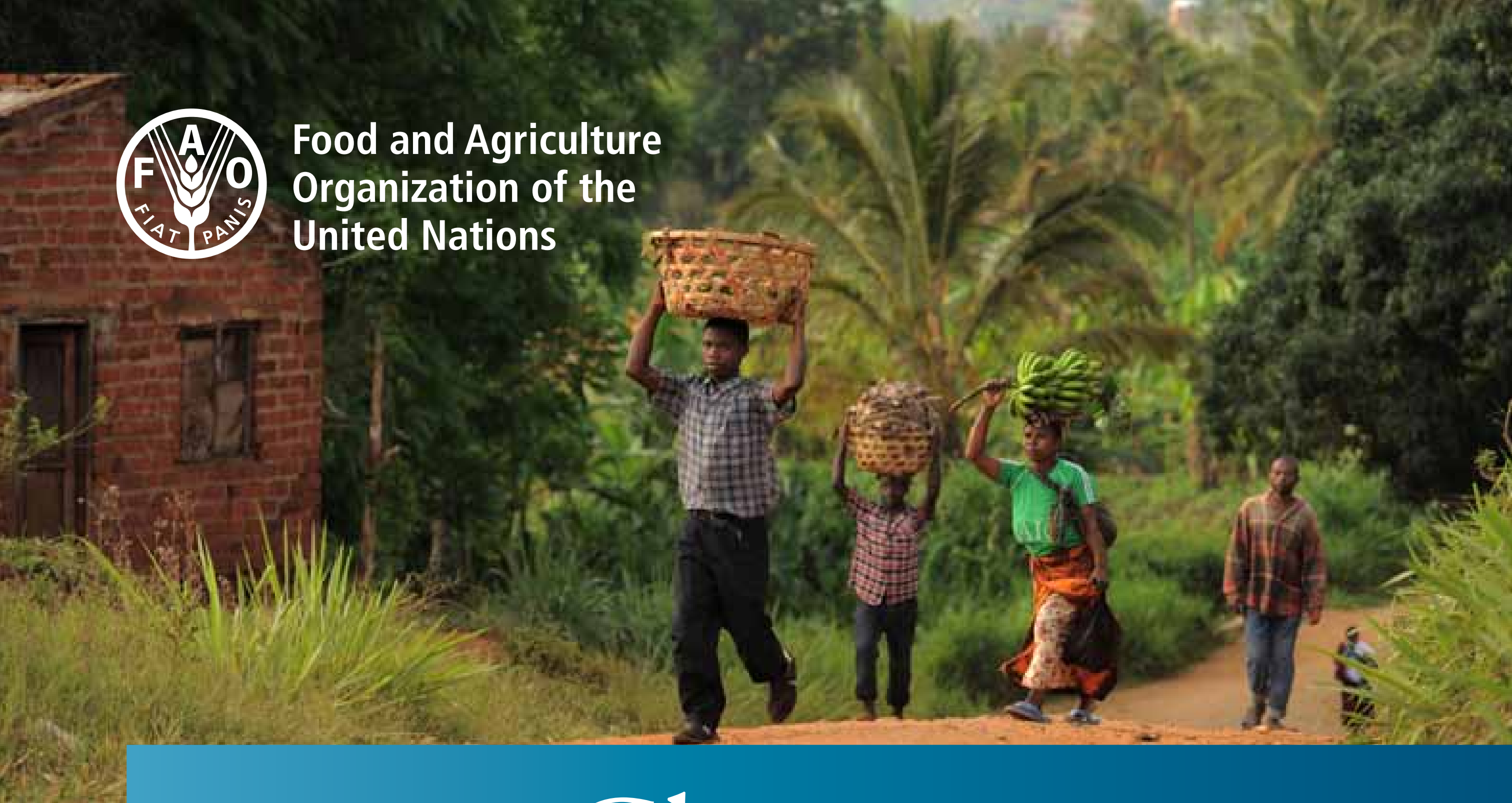
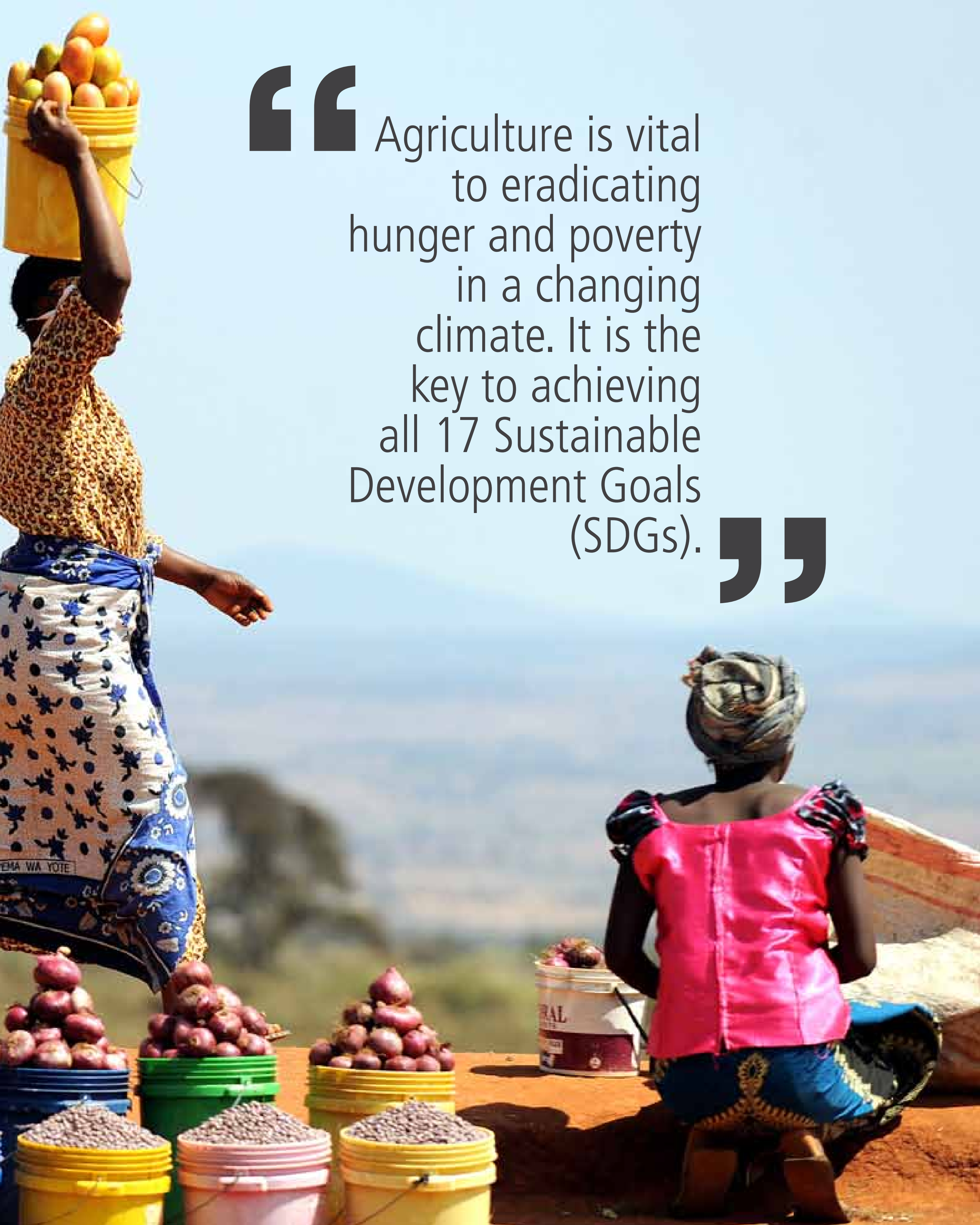
Food and Agriculture Organization of the United Nations



Climate action *in the* agricultural sectors

TANZANIA

Local food market.
©FAO/S. Maina



"Agriculture is vital to eradicating hunger and poverty in a changing climate. It is the key to achieving all 17 Sustainable Development Goals (SDGs)."

Opportunities for climate action in the agricultural sectors

The central importance of the agricultural sectors[1] for our societies, economies and natural environment was recognized in two landmark global agreements reached in 2015.

The 2030 Agenda for Sustainable Development

The agricultural sectors are key to achieving all 17 Sustainable Development Goals (SDGs). Agriculture is particularly vital to eradicating hunger and poverty (SDGs 1 and 2), as nearly 80 percent of the world's poor live in rural areas and earn income from agriculture and other natural resources. The agricultural sectors are also responsible for about 70 percent of global water use, and have a considerable impact on the health of soils, forests and broader ecosystems. Concerted action in agriculture is therefore crucial to achieving the 2030 Agenda.

1 Including crops, livestock, forestry, fisheries and aquaculture.

The Paris Agreement on climate change

The agricultural sectors were prominent in the vast majority of the Intended Nationally Determined Contributions (INDCs)[2] that developing countries submitted to the UNFCCC. These countries recognize that agriculture is vital to efforts to adapt to climate change because of its role in ensuring food security and providing livelihoods for the world's poor. The agricultural sectors also account for almost a quarter of global greenhouse gas (GHG) emissions. The international community must now support developing countries to act on their ambitious commitments – including those related to the agricultural sectors – to sustain the positive momentum generated at COP21.

2 The INDCs are the climate-related pledges that countries submitted ahead of COP21, and which formed the basis for the Paris Agreement.

Investments in agriculture are not only an imperative, but also an opportunity. Targeted investments in agricultural development can produce greater economic, social and environmental benefits than almost any other sector.

Combating poverty and hunger in a changing climate

By adopting sustainable agricultural practices that are tailored to the local context[3], smallholders can achieve considerable productivity and income gains[4] while simultaneously increasing the resilience of their agricultural activities and income to extreme weather and variable rainfall. This is vital to ensuring that they can adapt to a changing climate.

3 See for example FAO's Save and Grow approach to sustainable intensification of smallholder production.
4 Investments in agriculture have proven to be more effective in reducing extreme poverty than similar investments in other sectors, as outlined in the *World Development Report 2008*. One important consideration is that climate-oriented investments in agriculture can require a longer period of time to generate productivity and income gains as compared to more conventional agricultural investments. See for example FAO's Climate-Smart Agriculture Sourcebook, Module 14: Financing climate-smart agriculture.

Improving ecosystem health and natural resource management

Sustainable agricultural practices can halt and even reverse the over-exploitation of natural resources and degradation of land and aquatic ecosystems. Such practices will enable countries to not only reconcile their economic needs and climate-related commitments, but also become better stewards of the ecosystems and natural resources on which they depend for long-term prosperity.

Reducing greenhouse gas emissions

Sustainable agricultural practices can increase productivity and resilience while simultaneously easing the pressures that drive deforestation (e.g. the conversion of old-growth forest to arable land for farming) and improving the health of soils and other natural resources that sequester carbon. These mitigation co-benefits can often be achieved at little or no additional cost, and without inhibiting the broader development of the agricultural sectors.

High-impact areas for climate action

FAO has identified a series of high-impact areas for climate action in the agricultural sectors, and is supporting its member states to take action in these areas of importance.

Box 1: FAO's role

FAO is the leading source of technical expertise on agriculture and food security in a changing climate. FAO has accumulated this expertise over its 70 years of operations.

FAO is a member-driven and neutral organization. FAO has built a trusting relationship with its member states, resulting in constructive and collaborative engagements at country level.

FAO has the political mandate to partner with its member states to:

1. guide public investment in agricultural development; and
2. create an enabling environment to support private sector investment in agriculture.

RWANDA

A farmer spraying pesticide on a tea plantation in the marshlands.
©FAO/G. Napolitano

Restoring Degraded Lands and Forests

Globally, about 33 percent of the land used for agriculture is moderately or severely affected by soil degradation. Erosion, compaction, low soil organic carbon, nutrient mining and salinization are increasingly common. This is undermining farmers' productivity and resilience, as well as the long-term health of the ecosystems on which entire rural populations depend. The degradation and loss of forests is proceeding at a similarly alarming rate. About 13 million hectares of forest were converted to other land uses or lost every year from 2000 to 2010.

The restoration of degraded lands and forests through better agricultural practices offers a promising and cost-effective way to reverse these trends. Investments that utilize Sustainable Land/Soil Management (SLM) and Forest Landscape Restoration (FLR) approaches have proven to be effective in enhancing agricultural productivity, incomes and resilience, while simultaneously restoring the health of watersheds, soils and forests (see Box 2). Healthy soils and forests are not only the basis for farming and long-term food security, but also make an important contribution to carbon sequestration and the provision of other ecosystem services. The need to restore degraded lands and forests is recognized under SDG 15, and in international commitments such as the Bonn Challenge, 20X20 Initiative, the revised World Soil Charter and the 4 pour 1000 initiative.

FAO has the expertise and tools[5] to support widespread rehabilitation of degraded lands and forests. Through the Global Soil Partnership (including its Healthy Soils Facility") and other international initiatives, FAO has built a sizeable project portfolio in this area (see Box 3). Furthermore, FAO recently launched the Forest and Landscape Restoration Mechanism, through which it is working with countries in Latin America, Sub-Saharan Africa and Southeast Asia to develop and ultimately implement national FLR strategies. This provides a strong foundation on which to scale up country level support.

TANZANIA

Local farmers checking their crops. A series of droughts in central Tanzania has challenged the food security of rural farmers and reduced the availability of quality seeds and crop varieties, increasing the level of poverty in the region. ©FAO/S. Maina

About 13 million hectares of forest were converted to other land uses or lost every year from 2000 to 2010.

5 See for example the Sustainable Forest Management Toolbox.

Building on this body of work, FAO is currently assessing opportunities to:

1. work with governments to integrate support for SLM and FLR into national policies, strategies and catchment/landscape plans, and deliver extension services and other national programmes aimed at supporting greater uptake of these approaches;
2. work with communities, local service providers and other sub-national actors to engage in participatory land-use planning; and
3. work directly with smallholder farming and forest communities to invest in agricultural development that is rooted in SLM and FLR approaches.

Box 2: The benefits of rehabilitating degraded drylands in Niger

Through the Great Green Wall Initiative, farmers in Maradi, Niger engaged in farmer-managed natural regeneration, through which they manually increased tree density by 50 percent on over 50,000 square kilometers of degraded drylands. In so doing, they not only rehabilitated otherwise marginal lands, but also accrued considerable economic benefits. The farmers invested only about USD 10-15 per hectare (mostly in increased labour time). By contrast, the total economic benefit from increased wood sales, crop yields, livestock productivity and food availability is estimated to be about USD 200 per hectare.

Box 3: Action Against Desertification

With the support of the European Union, FAO is working with the African, Caribbean and Pacific Group of States (ACP) and a range of other actors to improve the health and productivity of landscapes in Burkina Faso, Ethiopia, the Gambia, Niger, Nigeria and Senegal. The Action Against Desertification initiative is supporting local communities to adopt sustainable land and forest management approaches. The initiative is also working with community groups, local NGOs and relevant government authorities to support the adoption of these approaches at scale, including through relevant trainings.

Disaster risk reduction for climate-resilient livelihoods

From 2003-13, the agricultural sectors absorbed nearly 25 percent of all loss and damage cause by climate-related disasters in developing countries. This has a devastating impact on the almost 80 percent of the world's poor who live in rural areas and earn income from agriculture for their livelihood. Climate change will earn income from agriculture. This threatens to undo many of the development gains made over the past few decades.

Investments in disaster risk reduction (DRR) can protect development gains and provide a sustainable path out of poverty and hunger in a changing climate. Of particular importance are public and private investments in resilient agricultural production and natural resource management, as well as social protection and insurance schemes that reduce vulnerabilities to extreme weather.

FAO is at the forefront of international efforts to systematically build resilience among vulnerable farmers, pastoralists, fishers and forest-dependent communities. FAO is a key partner in UN resilience-building initiatives such as Anticipate, Absorb, Reshape (A2R) – which is a collaborative initiative of the Rome-based UN Agencies – and the Capacity for Disaster Reduction Initiative (CADRI), among others. These initiatives provide a strong basis to scale up joint efforts for comprehensive and effective DRR.

Investments in disaster risk reduction (DRR) can protect past development gains and provide a viable path out of poverty and hunger in a changing climate.

KENYA

Gregory Mbindyo stands in his first round of maize crop which failed due to drought.
©FAO/C. Dowsett

The agricultural sectors absorbed nearly 25 percent of all loss and damage caused by climate-related disasters in developing countries disasters in developing countries from 2003-13.

In countries vulnerable to climate change and recurrent risks in Sub-Saharan Africa, Central America and Southeast Asia, FAO is currently assessing new opportunities to:

1. work with governments to improve disaster risk reduction and adaptation strategies and measures, promote sectoral social protection schemes and index-based insurance, and increase investments in climate-resilient agricultural practices and infrastructure that translate national goals for climate change and disaster risk reduction into local action;
2. strengthen the capacities of national and subnational actors to develop and manage early warning systems, monitor climate-related risks and vulnerabilities, and develop and execute emergency contingency plans with a view to translating early warning into early action;
3. support poor farmers, herders, fishers and foresters to utilize risk-reducing technologies, access weather-related information, develop community-based risk reduction and management plans, establish saving and loan schemes and contingency funds, and adopt sustainable and climate-resilient agricultural practices; and
4. improve preparedness and the capacity to bounce back after disasters have struck, and support rehabilitation of livelihoods in ways that reduce future risk exposure and increase food security in the face of climate change.

Box 4: Community Contingency Funds in Central America

With the support of the Government of Belgium, FAO worked with vulnerable rural communities in Guatemala and Honduras to reduce their risks to natural disasters. The project focused in particular on (i) supporting the adoption of more resilient agricultural practices; and (ii) supporting communities to establish and manage savings and loans schemes and mutual funds for contingency. These innovative financial services provide communities with the funds needed to restart agricultural activities after a disruptive natural disaster. This allows community members to maintain a healthy level of consumption despite the disruption to their livelihood, and re-invest in productive economic activity soon after.

Sustainable Palm Oil

Palm oil has become a key ingredient in a growing number of food and non-food products. The international demand for palm oil is steadily increasing and shows no signs of abating. This is driving land-use change in palm oil-producing countries, including the destruction of old growth forest. Deforestation and land-use change driven by palm oil expansion are significant sources of GHG emissions. The decomposition of wastewater from palm oil processing, known as Palm Oil Mill Effluent (POME), is also a major source of methane emissions (a far more potent GHG than carbon dioxide).

Global palm oil production is concentrated in a few countries. Targeted interventions can therefore have a transformational impact. Investments in the sustainable intensification of smallholder palm oil production can significantly improve farmers' productivity and resilience, while continuing to provide cost-competitive palm oil for national and international markets. If done at scale, this can significantly ease the pressures that drive deforestation in these countries. Meanwhile, POME (which is often discarded as waste) can be used to generate cost-competitive bioenergy. This also offers an investment opportunity that will have the added benefit of reducing methane emissions while bringing power to isolated rural communities.

FAO has the expertise and tools to transform the way palm oil is produced and processed (see Box 5). FAO has built strong working relationships with palm oil stakeholders in Southeast Asia, West Africa and Latin America. FAO is also a key partner in the Bioenergy and Food Security (BEFS) programme and the Global Bioenergy Partnership (GBEP), both of which provide a strong basis for future work.

INDONESIA

Aerial view of road, stream and forest area, of which parts had been cleared earlier for agriculture. ©FAO/H. Hiraoke

The decomposition of wastewater from palm oil processing is a major source of methane emissions.

In major palm oil-producing countries, FAO is currently exploring opportunities to:

1. work with public and private actors along the palm oil value chain to support sustainable intensification of palm oil production and the generation of bioenergy from POME;
2. partner with regional and national development banks to work directly with large numbers of poor smallholder producers to sustainably intensify their palm oil production;
3. work with governments and regional authorities to develop an enabling environment that better supports sustainable palm oil value chain development, including by providing extension services that favour sustainable intensification of palm oil production; and
4. foster cooperation among the world's major palm oil-producing countries to support the exchange of relevant knowledge, technologies and good practices.

Deforestation and land-use change driven by palm oil expansion are significant sources of greenhouse gas emissions.

Box 5: Bioenergy sustainability in Indonesia and Colombia

Members of the Global Bioenergy Partnership (GBEP) have developed a set of indicators to assess the sustainability of the bioenergy sector. With the support of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety, FAO recently tested these indicators by assessing the palm oil biodiesel value chains in Indonesia and Colombia. This initiative contributed to refining the GBEP indicators, while also providing valuable information about the broader production and processing of palm oil in these countries. FAO shed new light on the extent to which palm oil expansion is driving land-use change and deforestation in these countries, and gained valuable insights into the potential for sustainable intensification of palm oil production to combat these negative trends.

Blue growth for resilient fisheries and aquaculture

Fisheries and aquaculture support the livelihoods of about 12 percent of the world's inhabitants, many of whom earn a meagre income and are extremely vulnerable to climate change. Oceans, wetlands and inland water bodies also provide vital environmental services. The oceans store roughly 50 times more carbon dioxide than the atmosphere, and are home to about 80 percent of all life on Earth. Despite these vital contributions, the world's aquatic resources and ecosystems are under extreme stress from over-exploitation, pollution and climate change. Investments in blue growth are vital to reversing these trends.

Blue growth is a framework of fisheries and aquaculture practices that are able to reconcile economic needs with the need to manage aquatic resources more sustainably. Fisheries and aquaculture value chains that adopt blue growth practices can generate considerable productivity and income gains while managing aquatic resources in a way that contributes to restoring their long-term productive potential. Healthier oceans and wetlands are also more resilient to climate-related shocks, which improves the adaptive capacity of those who earn their livelihood from fisheries and aquaculture.

FAO is the leading international organization supporting blue growth in developing countries. FAO has developed a strong working relationship in this area with UNDP, UNEP, the African Development Bank and the World Bank, among others. Prominent joint initiatives include the *Global Sustainable Fisheries Management and Biodiversity Conservation in Areas Beyond National Jurisdiction* programme, as well as the *Coastal Fisheries Initiative*. FAO is also currently leading its own international *Blue Growth Initiative*, which is active in 10 partner countries.

KENYA

Richard Ooko Ogwang feeds his 1000 fingerlings fish in his pond supported by FAO and KARI.
©FAO/C. Dowsett

The oceans store about 50 times more carbon dioxide than the atmosphere.

FAO is currently exploring opportunities to support additional partner countries to:

1. increase awareness and knowledge of climate-related risks to fisheries and aquaculture, as well as risks to the communities that depend on these aquatic resources for their livelihoods;
2. support and incentivize the use of blue growth practices through national economic development and investment plans;
3. develop the capacities of government agencies, the private sector/SMEs and local stakeholders to administer services that support the uptake of blue growth practices, including through extension services; and
4. support communities to invest in blue growth value chain development that will generate income, as well as improve food security, climate resilience and the health of local ecosystems.

Box 6: Fuelwood-efficient fish processing in Liberia

In 2009, FAO launched the Food Security through the Commercialization of Agriculture project, through which it worked with fishing communities in Grand Cess, Liberia, to process and smoke fish products more efficiently. FAO worked with over 240 fish processors to construct Chorkor fish smoking ovens and insulated containers for fresh fish storage, allowing them to smoke fish and sell it in nearby Cote d'Ivoire, where there is a sizeable market for smoked fish. This allowed the predominantly female fish processors to substantially increase their income, while also significantly reducing the amount of wood needed to smoke fish. This further increased their profits while generating important climate change mitigation co-benefits.

The world's aquatic resources and ecosystems are under extreme stress from over-exploitation, pollution and climate change.

Scaling up Climate-Smart Agriculture (CSA) in Africa

Agriculture is an important source of income for the majority of the poor in Africa. The agricultural sectors are simultaneously among the most vulnerable to the variable weather and shocks associated with climate change, leaving Africa's poor in a precarious and vulnerable position.

Productive, inclusive and climate-resilient agricultural development is needed to protect recent development gains in Africa and provide people with a viable path out of poverty. Many African countries recognize this need, and are responding by prioritizing support for Climate-Smart Agriculture (CSA).

CSA is an approach to guide the transformation and re-orientation of agricultural systems to effectively and sustainably support food security in a changing climate. It is based on three pillars: (i) increase, in a sustainable manner, productivity and income growth in agriculture; (ii) support adaptation across the agricultural sectors to expected climatic changes and build resilience; and (iii) reduce, where possible, the GHG emission intensity of production systems. CSA can include a range of practices (including agroecology, Save and Grow, minimum tillage and conservation agriculture, among others) that contribute to these goals. CSA offers not only a technical basis for supporting countries, but also a strong intervention logic for doing so; the CSA approach focuses first on assessing countries' specific needs, existing policy frameworks and key issues, and then identifying and supporting agricultural policies and practices that are more 'climate smart'.

FAO is the leading source of expertise on CSA, and has distilled this expertise into its comprehensive Climate-Smart Agriculture Sourcebook. FAO has also supported many African countries to shift toward more climate-smart agricultural development (see Box 7). There is a pronounced need to build on existing progress to support African countries to scale up CSA.

ZIMBABWE

Agricultural Input Assistance to Vulnerable Smallholder Farmers in Zimbabwe.
©FAO/D. Kwande

Productive, inclusive and climate-resilient agricultural development is needed to provide people with a viable path out of poverty.

Building on its expertise, experience and country-level relationships, FAO is exploring opportunities to:

1. work with governments to assess vulnerabilities to climate change, the adequacy of existing policy frameworks, and opportunities for investing in CSA;
2. work with governments to seize the opportunities identified through corresponding policies, strategies and investment plans;
3. strengthen the capacities of line ministries and local actors to effectively support CSA, including by providing relevant trainings, extension services and business development services; and
4. work directly with local communities and smallholder agricultural producers (particularly women and youth) to engage in more productive and 'climate smart' agriculture along targeted value chains.

Agriculture is a vital source of income for the vast majority of the poor in Africa.

Box 7: CSA in National Agricultural Investment Plans (NAIPs)

Since 2013, FAO has been working with the governments of Lesotho, Malawi, Swaziland, Uganda, Zambia and Zimbabwe to increase national investment in CSA. FAO has been working with the governments to analyse their NAIPs – investment planning instruments that support the implementation of the countries' CAADP Compacts – to identify gaps and opportunities for CSA. This provides a strong foundation on which to scale up investment for agriculture that is more productive and 'climate smart' in these countries. FAO's guidelines on 'Incorporating climate change considerations into agricultural investment programmes' provide a similarly strong basis for such work.

From ride to reef: achieving food security and nutrition in Small Island Developing States (SIDS)

The group of Small Island Developing States (SIDS) comprises a wide range of countries, most of which are characterized by poverty, structural weaknesses and a geographic handicap. In the 17 SIDS for which data is available, an average of 26.5 percent of the population lives on USD 1.25 per day or less. Malnutrition is both a consequence of, and contributing factor to this underdevelopment. Many of these poor and malnourished people live in (or in close proximity to) coastal areas and earn a meagre income from agriculture and fisheries. This leaves them vulnerable to extreme weather events such as cyclones, typhoons, tropical storms and sea level rise. Unsustainable management of coastal resources (e.g. cutting down mangrove forests) exacerbates their vulnerability to climate-related shocks. Unlike in continental countries, coastal communities in SIDS cannot migrate inland to look for arable land or other ways to earn a living. Confronted with these unique challenges, SIDS must take concerted action now to ensure their most vulnerable inhabitants can prosper in a changing climate.

There is no single solution to the challenges faced by SIDS. A more country-focused approach is required to address the range of challenges in these countries. Integrated Coastal Management (ICM) has proven to be an effective means of doing precisely this. ICM is a framework for bringing together policymakers, private sector representatives and coastal communities to better understand and confront the complex challenges they face with regards to economic development, natural resource management and climate change adaptation. In so doing, these actors can make informed decisions about how to invest public and private resources to achieve common goals.

FAO has built a strong relationship with SIDS to support them in addressing their unique vulnerabilities to climate change. FAO further solidified its relationship through a Memorandum of Understanding with the African, Caribbean and Pacific (ACP) Group of States during the *High-level Panel on FAO work with SIDS* at the 2015 FAO Conference.

GRENADA

A group of fishermen bringing the day's catch ashore.
©FAO/G. Bizzarri

SIDS are among the most susceptible countries to the extreme weather and sea level rise associated with climate change.

FAO has the tools and experience to support SIDS to utilize ICM to increase productivity and enhance resilience in coastal communities while simultaneously strengthening natural resource management.

FAO is currently gauging opportunities to partner with SIDS countries to:

1. convene relevant stakeholders (government, private sector, coastal communities) to collectively identify their unique vulnerabilities, challenges and opportunities;
2. work with governments to better manage coastal zones, including by delivering relevant participatory extension services, establishing adequate marine protected areas to preserve natural resources, and developing national plans to sustainably manage key seafood commodities; and
3. work directly with family farmers and fishers to invest in sustainable coastal economic activities that allow them to increase their productivity, incomes and food security and nutrition.

In SIDS, 26.5 percent of the population lives on USD 1.25 per day or less.

Box 8: Integrated landscape management in Fiji and Samoa

FAO is working with Fiji and Samoa to improve the countries' long-term prospects for food security and nutrition through widespread use of integrated landscape management. FAO is first identifying how land and water resources are used in the target areas (by municipalities, agriculture and industry), and how to manage these resources more sustainably. Based on these findings, FAO plans to work with local communities to pilot appropriate agricultural production systems such as agro-forestry and integrated agriculture-aquaculture, and work with policymakers to support the adoption of these pilots at scale.

Integrated Land Management for REDD+

Agriculture, forestry and other land use account for almost a quarter of global greenhouse gas emissions. A significant proportion of these emissions come from deforestation and land-use change. REDD+ seeks to address this issue by providing developing countries with financial incentives to reduce deforestation and forest degradation, sustainably manage forests, and conserve and enhance forest carbon stocks. Countries have invested considerable time and money into 'REDD+ readiness' to develop the necessary policies and institutions. In many countries, readiness efforts have understandably focused on the forestry sector. However, one important lesson that emerged from these efforts is that the main driver of deforestation is often the expansion of agricultural land for crops and grazing. An integrated approach to sustainable land use and land management offers greater benefits for addressing deforestation and forest degradation, and accessing REDD+ payments.

Investments in the sustainable intensification of agricultural production[6] can generate considerable improvements in productivity, income and food security among smallholder agricultural producers on existing agricultural land. In so doing, these investments can ease the pressures that often drive deforestation. Forest and Landscape Restoration is similarly important in this respect, as it can bring degraded lands back into production and thereby reduce the need for expansionary agricultural development. Investments in these areas will significantly improve the effectiveness of actions in the forestry sector that aim to generate verifiable emissions reductions and removals that qualify for REDD+ payments. This can give rise to a virtuous cycle in which forest, agriculture and livestock stakeholders work together to generate REDD+ payments, and reinvest them in sustainable agricultural development and land management.

FAO has considerable experience providing support related to REDD+ due to its leadership role in the UN-REDD programme. FAO is also among the leading sources of expertise on the sustainable intensification of agricultural production, Forest and Landscape Restoration and Sustainable Forest Management.

LAOS

©FAO/J. Broadhead

Integrated approaches to land management are the key to addressing deforestation and forest degradation

6 FAO's Save and Grow approach to sustainable intensification has proven extremely successful. See for instance the Policymaker's Guide to the Sustainable Intensification of Smallholder Crop Production, as well as the Save and Grow guides on cassava and maize, rice and wheat.

Building on its strong relationships with REDD+ stakeholders in many of its member states, FAO is exploring opportunities to:

1. work with governments to develop the policies needed to address deforestation in an integrated manner, accounting for its direct and indirect drivers, including agricultural development;
2. work with governments to finance and implement pilot policy initiatives that prevent and/or reduce deforestation, and that could ultimately produce verifiable emissions reductions and/or removals that would qualify for REDD+ funding; and
3. work with governments to build on REDD+ pilots and develop a system for sustained evidence-based policymaking on deforestation and land use that is able to generate results-based REDD+ payments. This could include strengthening governments' capacities to monitor forest cover and land-use change, as well as to develop and execute evidence-based policies and programmes that continue to address deforestation in an integrated manner.

Agriculture, forestry and other land use account for almost a quarter of global greenhouse gas emissions.

Reducing methane emissions from livestock for improved productivity and livelihoods

Methane (CH4) is a Short-Lived Climate Pollutant (SLCP) with a life span of only 12 years – far less than the 100-300-year life span of CO2. However, methane is a much more potent greenhouse gas (GHG). It traps 84 times more heat than CO2 over the first two decades after it is released into the air. The comparative impact of CH4 on climate change is 28 times greater than CO2 over a 100-year period. Reducing methane emissions can therefore have relatively quick climate benefits in the short run.

Agriculture accounts for half of global anthropogenic methane emissions. Within agriculture, livestock is responsible for 78 percent of methane emissions, of which 70 percent is enteric methane (a natural product of digestion for ruminants such as cows, sheep, goats and buffaloes). The remaining 8 percent comes from animal manure. Collectively, this constitutes a significant share of global GHG emissions. Using methane's 20-year global warming potential (GWP) - a measure of the short-term climate impact of different GHGs – more than triples the share of methane to over 18 percent of global GHG, from slightly less than 6 percent using the 100-year timeframe.

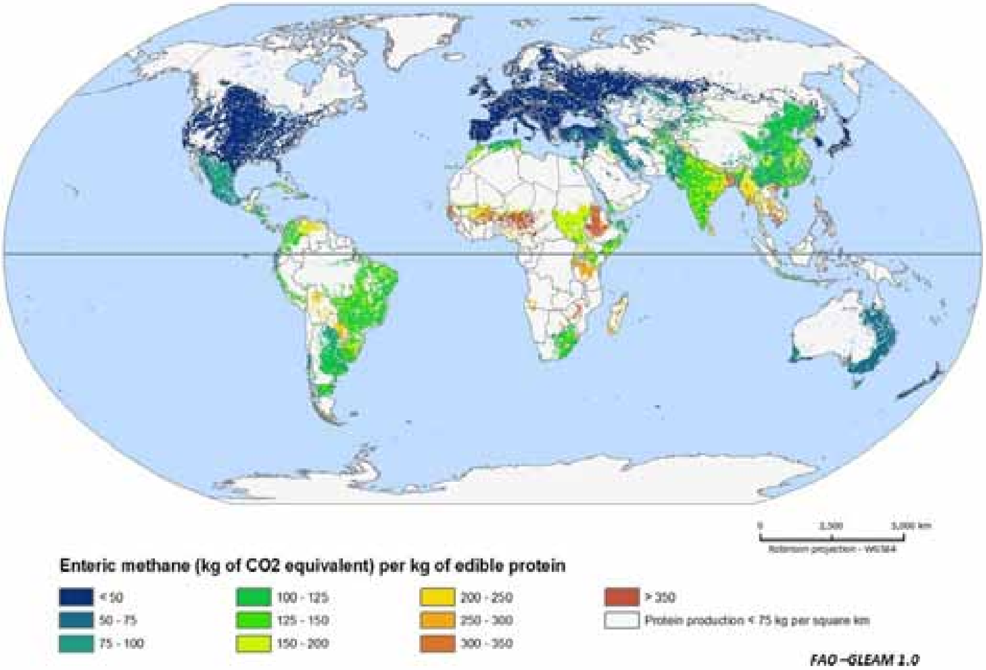
Livestock is also vital to reducing hunger and poverty. Food from animal sources accounts for 18 percent of global calorie consumption and 25 percent of global protein consumption. It also helps address hidden hunger by providing high-quality protein and a variety of micronutrients. Meanwhile, among the 729 million poor people who live in rural and marginal areas, about 430 million are estimated to be poor livestock keepers whose livelihoods depend on the animals they raise.

Methane emissions are losses for farmers. Total enteric methane emissions at global level are equivalent to about 144 Mt oil per year, which is about the final energy consumption of a country like France. There is therefore a strong link between GHG emission intensity and natural resource use efficiency.

FIGURE 1

©FAO

Methane emissions from livestock are a major driver of climate change



A wide range of options are available to increase productivity in livestock while reducing methane emissions per unit of product. For example, FAO estimates that in mixed dairy cattle systems in South Asia, enteric methane emissions could potentially be reduced by 30 percent through improvements in feed quality, animal health and husbandry while boosting milk production by 24 percent (equivalent to 13 million tons of milk).

Reducing methane emissions poses a set of challenges. Animal husbandry depends on diverse biological processes and producers, subject to constantly changing weather, climate, pests, and input costs and availability.

FAO supports its member states to respond to these challenges by:

1. producing global and regional assessments that help target interventions (see Figure 1);
2. providing support to countries to identify, diffuse and adopt locally-relevant practices and technologies for enhancing productivity;
3. providing tools and methodologies for the quantitative assessment of productivity gains and mitigation potential; and
4. working with relevant stakeholders to facilitate policy dialogue in the livestock sector, improve access to relevant information and support frameworks for investments aimed at reducing methane emissions from livestock.

Box 9: Reducing enteric methane emissions for food security

FAO and the Global Research Alliance on Agricultural GHGs are collaborating on a project funded by the Climate and Clean Air Coalition focusing on enteric methane emissions in Uruguay, Argentina, Ethiopia, Kenya and Bangladesh. FAO coordinates efforts and provides tools for the assessment of production systems in these countries, identifying options looking at feed, animal health or manure management, and quantifying the potential to increase productivity and reduce emission intensity. Based on these findings, FAO will work with countries to identify investment opportunities for implementation at scale. FAO is also promoting dialogue among ministries, private sector actors, research organizations and NGOs on how to approach methane

GUATEMALA

Increasing food supply to the market and subsistence production to reduce the impact of food-price rises on the most vulnerable population groups in Guatemala. ©FAO

“More sustainable, productive and resilient agriculture can deliver the kind of transformative change we so urgently need”

JOSÉ GRAZIANO DA SILVA

FAO Director-General

Climate action *in the* agricultural sectors

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