



# Climate change, agriculture and food security



## 1. Key challenges to the agriculture sectors and food security

The world committed to eradicate extreme poverty and hunger by 2030, bringing it back to a sustainable path. Climate change threatens to reverse the progress we have made so far in the fight against hunger and poverty. If not harnessed, it could imperil the capacity of food systems to insure global food security. We need to act now.

Climate change is undermining the livelihoods and food security of the rural poor.

The world's most vulnerable people -- who are the first and hardest hit by climate change -- are the same people who provide the bulk of the planet's food: family farmers, pastoralists, fisher folks and community foresters. Climate change and variability, alongside ocean acidification and other drivers of change, reduce productivity and food production. Drought, floods, sea level rise, and hurricanes put not just people's lives but their very livelihoods at risk, destroying crops, livestock and fish resources and ecosystems; agriculture, livestock and fishing infrastructure as well as productive assets such as irrigation systems and livestock shelters.

For the world's poorest, adaptation to climate change means ensuring food security.

Today the 50 poorest countries are already the most affected by climate change, including many Small Island Development States. These countries have not created the problem and they should not bear the burden of climate change. In fact, they were responsible for

only 4.7 percent of global greenhouse gas emissions in 2012. We need to support them to adapt and be resilient.

Frequent extreme weather patterns will adversely impact trade and food price stability by disrupting transportation, supply chains and logistics. While global markets can play a stabilizing role for prices and supply, and provide alternative food options for regions negatively impacted by changing conditions, trade alone is not a sufficient adaptation strategy.

FAO believes that much of the response lies with the agricultural sectors – including forestry, fisheries, and aquaculture – and we need to (i) increase awareness of food security and raise political commitment at all levels; (ii) develop data analysis on impacts and options in the agriculture sectors and make it available to decision makers and smallholder farmers; (iii) increase investment, research and development to build resilience and address anticipated climate change impacts.

### Example: Plant genetic resources

Under the Global Plan of Action for Plant Genetic Resources for Food and Agriculture (2011), FAO supported the development of national seed policies in Afghanistan, Benin, Gambia, Ghana, Guinea, Niger, Sierra Leone and others. This includes support to conserve, identify and access useful crop diversity, develop stress-resistant locally adapted crop varieties, and establish seed systems to facilitate access to farmers. FAO and the Commission on Genetic Resources for Food and Agriculture will launch the Voluntary Guidelines to support the integration of genetic diversity into national climate change adaptation planning.

## 2. FAO support to countries on climate change

FAO supports its members to develop more productive, inclusive and resilient agricultural systems to reduce poverty and improve food security and nutrition in a changing climate.

Climate change is a priority cutting across all FAO's work. The 2016 State of Food and Agriculture (SOFA) report will provide a state of the art assessment of the links between climate change, food security and agriculture, with a particular focus on the impact on vulnerable regions, systems and populations.

FAO advocates for an integrated approach at country level, targeting food security, adaptation and co-benefits, such as mitigation. For this, a suite of tools, methods and databases has been developed for countries and partners to assess risks, vulnerabilities and adaptation options, and to measure emissions and prepare inventories.

Approaches include climate-smart agriculture, conservation agriculture, agroecology, sustainable soil management, landscape restoration, sustainable forest management, improvement of genetic resources and biotechnologies and sustainable livestock management, to name only a few.

Some of FAO's key activities include:

### A. Strengthening the evidence base to inform decision-making

This ranges from providing estimates of long-term impacts of climate change on the agriculture and food security sectors, to assessing mitigation and adaptation benefits of different systems and approaches, to assessing costs and barriers to adoption of practices, to developing monitoring and verification systems and promoting the integration of adaptation measures in relevant national planning and budgeting processes. Some examples of support given to countries to collect data and carry out assessments to underpin policy decisions:

**Understanding constraints to adopting climate smart agriculture in Malawi, Zambia and Viet Nam:** Support has focused on building the

evidence base to identify country and context-specific climate smart agricultural practices, assessing costs and barriers to adoption, increasing policy and research capacity to integrate climate change issues into agricultural and food security planning and vice versa, and developing investment proposals for scaling up climate smart agriculture activities under climate finance as well as traditional agricultural investment finance.

### **FishAdapt - Building resilience at the front line**

Fisheries and aquaculture are vital source of nutritious food for 10-12 percent of the population. The build-up of carbon dioxide and other greenhouse gases is changing features of the oceans, coasts and freshwater ecosystems, severely compromising their ability to deliver food for future generations. Leveraging FAO's technical expertise and working through regional fishery bodies, partnerships and networks, FishAdapt is working to mitigate and adapt to the impacts of climate change for fisheries, aquaculture and aquatic ecosystems. FishAdapt already supports the sector in five regions around the world and pilot ground level work has begun in Bangladesh, Chile, seven Eastern Caribbean States, the Benguela Current countries (Angola, Namibia, and South Africa), Malawi and Myanmar.

### **Inter-disciplinary climate change impact assessment in Peru and the Philippines**

Estimation of the long-term impacts of climate change on the agriculture sector and food security to 2100 using the *Modeling System for Agricultural Impacts of Climate Change* (MOSAICC) tool – which uses downscaled climate change scenario data, integrated with crop and hydrological models customized to country contexts – has brought together stakeholders from the agriculture and environment sectors to strengthen the evidence base to inform policy decisions.

### **Reducing Emissions from Deforestation and Forest Degradation (REDD+)**

REDD+ is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. FAO is specifically supporting developing countries to undertake



REDD+ activities following the decisions of the UNFCCC and is helping to set international standards for monitoring, reporting and verification (MRV). FAO has already supported 16 countries to develop their MRV systems.

## B. Managing transboundary animal and plant diseases in a changing climate.

There is evidence that global warming has resulted in the spread and adaptation of certain fly and mosquito populations to thrive beyond their existing geographical range spreading diseases such as bluetongue virus, West Nile virus and malaria in hitherto non-infected places. Climate change can severely impact the spread of transboundary animal and plant diseases, specifically animal diseases. Focussing on prevention, FAO monitors these diseases to identify and address underlying risk factors. Developing various global information systems covering emergency prevention, global early warning and animal disease, combined with climate-based forecasting models, FAO and partners strengthen the capacities of FAO member countries to use available tools and information, and work with them to contain threats and protect the livelihoods, food security and overall well-being of poor agricultural producers.

## C. Enhancing resilience to climate-related disasters

A new FAO 2015 study reveals that at least 25 percent of the total economic impact of climate related disasters in developing countries is absorbed by the agriculture sector. In the case of droughts, this is as much as 84 percent of total damages and losses. FAO climate resilience work is built on four pillars: i) disaster risk governance in agriculture; ii) sector-specific climate and weather information services and early warnings; iii) access to technologies, services and good practices to reduce vulnerability, and iv) improved preparedness and response for early action and recovery. FAO ongoing support to disaster-prone developing countries across vulnerable sub-regions (i.e. the *Corredor Seco* of Central America, the Sahel, the Horn of Africa, South East Asia) illustrates this shift from crisis response to preventive and proactive measures across these four elements. Together with its partners, FAO anticipation and prevention support saves human lives and

### Early Warning - Early Action

Food crises such as the 2011 Somalia drought-conflict and famine have led to a renewed focus on the challenges to trigger early action in response to early warnings. Especially slow-onset disasters such as droughts with high levels of accurate predictability and relatively long lead times provide an excellent opportunity to take early action to strengthen the resilience of agriculture livelihoods of at-risk populations, thus preventing situations from escalating into emergencies.

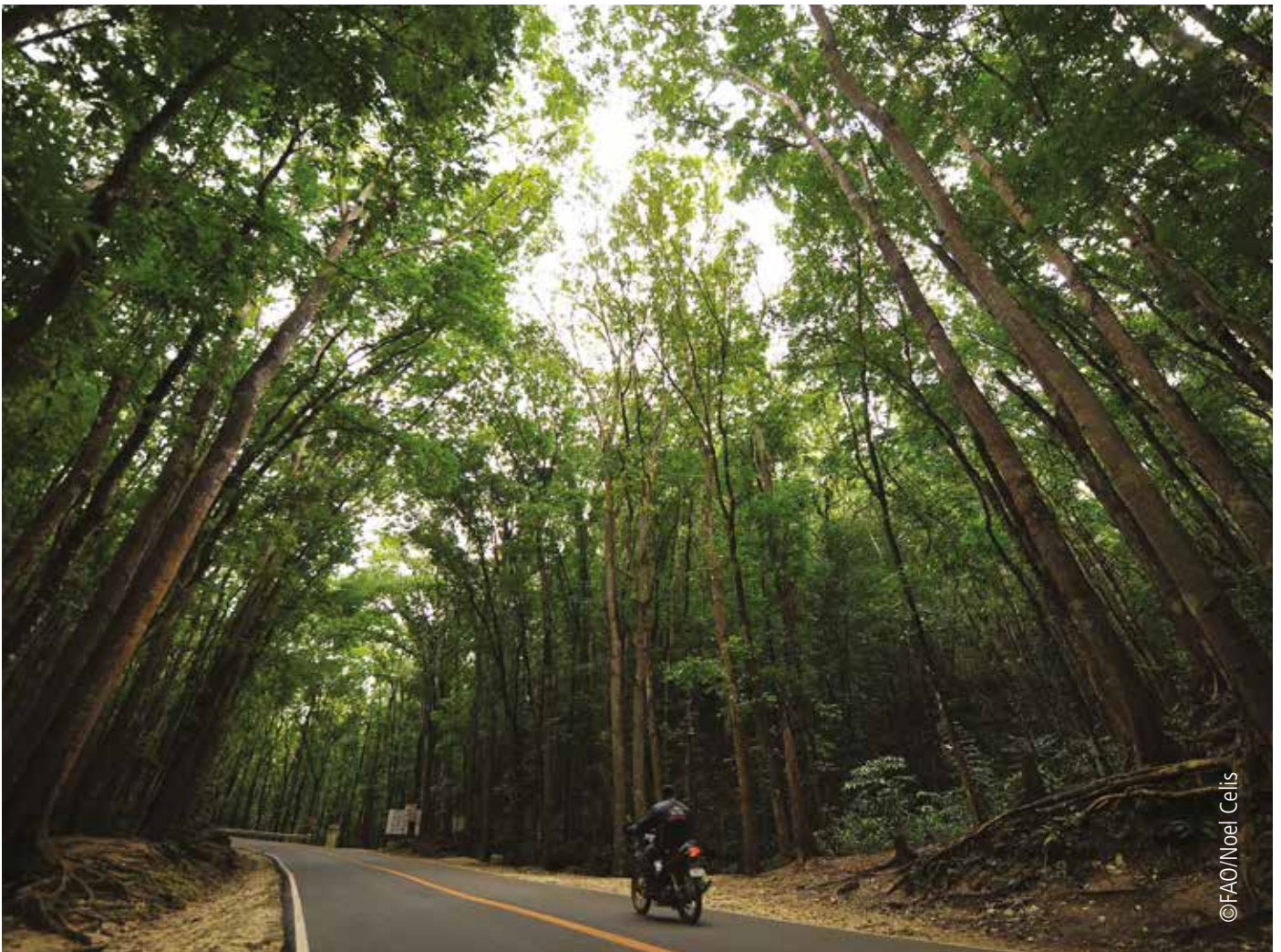
At country level, FAO works in close collaboration with national authorities to: establish disaster risk and early warning mechanisms; develop indicators and evidence-based early action triggers; and draft pre-approved Early Action Plans that will be implemented once these triggers have been reached. Depending on the type of hazard, the sector and the agro-ecosystem at risk, FAO supports the implementation of "Early Action plans" for preventive measures such as protecting strategic seed reserves at national and community levels, using shorter cycle quality seeds for harvest before the hurricane season, producing and storing fodder for livestock, promoting water harvesting and conservation, and various emergency preparedness activities.

livelihoods, reduces economic losses and suffering and decreases the costs of humanitarian responses. The cost-benefits analysis of investment in resilience for the agriculture sectors is in progress. Today evidence shows that for every USD 1 spent on Disaster Risk Reduction measures, at least USD 2 to 4 dollars are returned in terms of avoided or reduced disaster impacts.

## 3. FAO and the international debate on climate change

- FAO is building on the momentum of the Sustainable development goals (SDGs) to bring agriculture and food security more prominently into the discourse on climate change, as well as the UNFCCC negotiations, with a particular emphasis on adaptation. In this regard, FAO has joined forces with the host countries of the COP 21 (France) and COP 22 (Morocco).
- **COP21:** The Paris Agreement was adopted in December 2015 and will come into effect in 2020. The inclusion of food security concerns in the preamble to the Paris Agreement is indicative of the fact that Parties are increasingly recognising the needs of the poor, vulnerable and food insecure in the broader response to climate change.





- **COP22:** FAO is already working with the Government of Morocco to prepare COP22, and ensure that agriculture and food security concerns feature prominently. Importantly, FAO is developing a Technical Cooperation Programme to strengthen regional capacities on climate change adaptation in the lead-up to COP22, and support its member countries (particularly agricultural negotiators) during upcoming rounds of the UNFCCC negotiations.
- **From 2015 to 2020** (implementation of the new agreement), FAO will work with its members to promote country action. This means refining and achieving the commitments made in their Intended Nationally Determined Contributions (INDCs) – the voluntary climate-related pledges made in the lead-up to COP21. Many INDCs include a considerable emphasis on the agriculture sectors, and explicitly request financial and technical support to achieve goals and targets. FAO is working to mobilize internal and external resources needed to respond effectively to these requests.

#### 4. Why partner with FAO?

FAO is a knowledge organization with its feet on the ground. Its highly decentralized structure and country presence ensures a global reach and ability to respond.

Its **unique strengths** lie in its multidisciplinary technical expertise and competence, highly trusted by members and partners and its neutrality and its convening power as well providing a *unique platform for dialogue and advocacy*.

FAO supports its members to develop more productive, inclusive and resilient agricultural systems, and is recognized as an actual and potential source of knowledge and capacity for strengthening countries' climate change response in the agricultural sectors, with special focus on food security, adaptation and resilience. FAO is also recognized for helping government agencies and other partners *to harmonize climate change and Disaster Risk Reduction policies and strategies*; and to act as a *trusted facilitator and neutral source of technical data* among global climate-related institutions and fora.