



Climate change and rural development

Context

Feeding the world's steadily growing population while respecting the planetary boundaries will be a key challenge for humanity in the future. Prevailing production and consumption patterns are leading to a loss of natural resources and destroying ecosystems and their functions. More than 820 million people were affected by malnutrition in 2017. Climate change is exacerbating this development and pushing natural ecosystems to their limits, something that is having far-reaching consequences for the environment, the economy and humanity. Food and land use systems must become more sustainable and climate-resilient to ensure the survival of humankind.

Adaptation is a necessity

According to the Food and Agriculture Organization of the United Nations (FAO), agricultural production must increase by 60% between 2005 and 2050 to guarantee food security. This is in contrast to environmental and climate change targets and poses a major challenge given the negative impacts of climate change on the productivity of food and land use systems in many regions of the world (see *Figure 1*). Climate variability and extremes are the main factors driving a growth in global hunger. For climate-related disasters such as floods, droughts and tropical storms, 25 percent of all damage and losses is on the agriculture sector. The number of extreme weather events has doubled since the beginning of the 1990s. Moreover, climate change will further exacerbate soil degradation caused by land use not suitable to local conditions. Climate change is predicted to reduce area productivity in sub-Saharan Africa by 14-27% by the year 2080, with an 18-32% decrease projected for South-East Asia.

The potential for mitigation

Accounting for 21-37% of global greenhouse gas (GHG) emissions, current food and land use systems are one of the main drivers of climate change. Some 10-12% of global emissions come directly from agriculture (particularly from livestock farming, wet rice cultivation and the use of mineral fertilisers), an 8-10% are attributable to land use and changes in land use (e.g. converting forests and swamps into arable land and pastures). Up to 80% of deforestation in the tropics can be traced back to the expansion of agricultural land. Roughly 5-10% of emissions are generated along agricultural supply chains, in other words during the storage, processing and transportation of agricultural products. Growing consumption of animal proteins and rising food waste, especially in industrialised nations and emerging economies, also have a significant impact on the emissions footprint.

Climate-resilient and low-emissions food and land use systems

Food and land use systems are fundamental to global food security and considered a key lever for mitigating climate change. Reducing GHG emissions and adapting to climate change are mutually reinforcing and vital for making agricultural ecosystems and smallholder farms more resilient to climate change-related risks and for achieving additional goals of the 2030 Agenda.

Many approaches to developing food and land use systems, especially agroecological approaches, contain climate-resilient and low-emissions strategies and practices. They work towards a variety of goals simultaneously: increasing productivity and efficiency per unit area as well as conserving and sustainably using soil, water resources, forests and biodiversity. Crop diversification and tapping into off-farm income help farmers to minimise their risk of a loss of harvests and income. Promoting a balanced diet and prevent-

ing food loss and waste, particularly in industrialised nations and emerging economies, also make an important contribution towards climate change mitigation.

Sector-specific needs mean that political and institutional enabling conditions, coherent policies and intersectoral coordination at multiple levels are needed with regards to climate change mitigation and adaptation in food and land use systems to balance out trade-offs, for instance between food production, bioenergy and biodiversity conservation.

We need to transform current food and land use systems in order to shape sustainable and equitable development while respecting planetary boundaries and to guarantee balanced, affordable and healthy diets in the era of climate change.

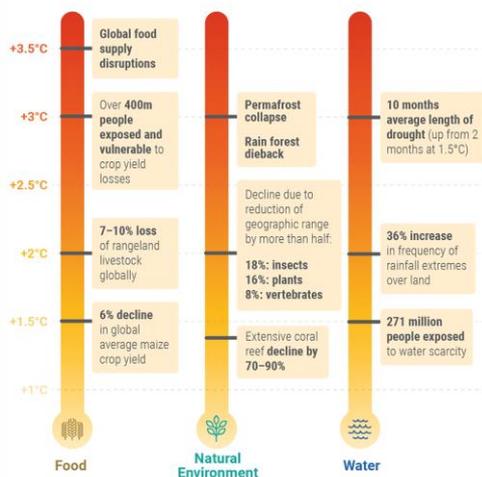


Figure 1: The impacts of different global warming scenarios on food security and ecosystems (World Resources Institute, 2019).

BMZ's development policy commitment

Germany ratified the Paris climate agreement in 2016 and supports partner countries as they implement their Nationally Determined Contributions (NDCs). German development cooperation (DC) also supports political decision-makers as they build capacity to effectively implement the agricultural components of the NDCs. The German Federal Ministry for Economic Cooperation and Development (BMZ) is pursuing coherent implementation of global agendas for sustainable development, climate change mitigation and adaptation and disaster risk management by embracing a comprehensive risk management approach.

Within the parameters of bilateral, regional and multilateral DC, BMZ is fostering a climate-resilient and low-emissions approach to land management that does not use natural resources beyond their natural capacity for regeneration, creates appropriate living conditions in rural areas and is economically viable. German DC undertook around 190 rural development and climate projects between 2014 and 2018, investing around EUR 1.3 billion in the process. These projects concentrated on climate change adaptation in agriculture, with a regional focus on Africa.

BMZ approaches

With its projects, BMZ is working towards the goal of harnessing synergies and co-benefits between targets, such as strengthening resilience, food security, poverty reduction, environmental protection, climate protection and economic development, in a targeted manner. The following climate-related approaches are implemented together with partners:

Climate policy perspective

The 2015 **Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC)** sets a target of keeping the increase in global warming to below 2°C and if possible, below 1.5°C to prevent climate risks. The Agreement is implemented through mandatory **Nationally Determined Contributions (NDCs)** that define mitigation and adaptation goals. In their NDCs, the vast majority of developing countries and emerging economies attach particular importance to the food and agricultural sector for achieving adaptation as well as mitigation targets.



The **Koronivia Joint Work on Agriculture (KJWA)** is a milestone in negotiations about agriculture within the context of UNFCCC and underscores the importance of food security to the climate change agenda. By involving agriculture in UNFCCC processes, KJWA can advance the transformation of food and land use systems and foster synergies between adaptation, mitigation and agricultural productivity.

Deforestation-free value and agricultural supply chains

Most deforestation can be traced back to forests being converted into agricultural land to grow soy, palm oil, cocoa, coffee, rubber and for cattle farming. Sustainable crop production to conserve forests and the development of deforestation-free value chains for agricultural products are being promoted while deploying spatial planning instruments. This can prevent the expansion of agricultural land, secure a living income and make a contribution to biodiversity conservation and GHG mitigation all at once.

Nature-based and ecosystem-based approaches

With their diverse functions, intact ecosystems are the basis of human life. Ecosystems are increasingly degraded and losing their ability to function due to anthropogenic influences. The conservation, restoration and sustainable use of ecosystems thus lays the groundwork for connecting climate change mitigation and adaptation, disaster prevention, biodiversity conservation, rural development and sustainable resource management.

Agroecology

Agroecological practices use resources more efficiently and sustainably by promoting systemic approaches wherever possible. By enhancing the natural soil fertility of arable land and pastures, yields can be stabilised and the use of mineral fertilisers decreased, especially during stress. Agroecological approaches aim for a transformation of food and land use systems, which is essential to achieving climate goals.

Soil conservation and sustainable land management

Soils are the basis of human life. Droughts and heavy rainfall increase the risk of soil erosion, while rising temperatures reduce water storage. Sustainable land management is key to climate change adaptation. Increasing soil organic carbon improves soil fertility. This raises agricultural yields while also contributing towards the mitigation of emissions.

Integrated water resources management

Even the most fertile soil cannot produce a yield without water. Many partner countries use up to 90% of their water resources for irrigation. In many arid regions, water scarcity will be exacerbated by a lack of precipitation in the future. Sustainable watershed and water resource management and the application of efficient irrigation technologies are key elements in climate-resilient agriculture.



Figure 2: The use of compost as an organic fertiliser to improve soil fertility offers multiple climate co-benefits, for adaptation as well as mitigation.

Climate risk insurance

A comprehensive climate risk management approach also entails strategies for dealing with the impacts of extreme weather events, which might become more frequent due to climate change. Climate risk insurance is a tool that supports affected people as they deal with the impacts of extreme weather events, for instance by providing small-holders with financial support for lost harvests.

Examples of our work

One key hallmark of German DC is the coherence between its engagement in the field of rural development and Germany's commitments in the context of the 2030 Agenda and the three Rio Conventions on climate change (UNFCCC), combating desertification (UNCCD) and biodiversity conservation (CBD).

BMZ is a supporter and, in some cases, a co-founder of the following **multilateral initiatives**:

The **NDC Partnership** supports developing countries and emerging economies in rapidly and effectively implementing their NDCs. It fosters access to technical knowledge, advisory services and financial support, builds capacity and supports knowledge-sharing so that national climate policies make progress and the global level of ambition increases.

As part of the **Global Commission on Adaptation (GCA)**, BMZ is supporting 60 million people living in rural areas in enhancing their climate resilience and is shaping the transformation towards climate-resilient and low-emissions agriculture. GCA works with the goal of raising ambition and driving momentum for the implementation of climate change adaptation solutions.



Figure 3: Embracing climate-friendly growing practices in wet rice systems is an important climate change mitigation measure.

BMZ is supporting the **InsuResilience Global Partnership**. It aims to safeguard 500 million people against climate risks by 2025 by making available previously arranged financing and risk transfer solutions, such as agricultural insurance policies, for climate and disaster risks and by assisting countries in their preparedness efforts to cope with disasters.

GIZ also implements a large number of **bilateral, regional and global projects** on behalf of BMZ, for example:

Smallholders in **Madagascar** are severely affected by climate change and suffer in the wake of droughts, heavy rainfall and cyclones. Working together with the EU, BMZ is strengthening the country's resilience through the project **Adaptation of Agricultural Value Chains to Climate Change (PrAda)**. Farmers can better plan their production with the help of climate and weather information. The project makes adapted crop calendars available via a free telephone hotline and promotes the introduction of climate risk insurance. This is improving the livelihoods of 16,000 households and safeguarding them against the impacts of climate change.

The regional project **Adaptation to Climate Change in Rural Areas in Southern Africa (ACCRA)** supports the sharing of knowledge on climate-resilient agriculture and its implementation in Member States of the Southern African Development Community (SADC). To this end, the project is strengthening the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) in its role as a knowledge broker and facilitator for agricultural research and development. A regional information and knowledge management system has been established since 2016 and more than 8,000 advisory service providers and decision-makers have been trained.

The global project **Soil Conservation and Soil Rehabilitation for Food Security** supports **Benin, Burkina Faso, Ethiopia, India, Kenya, Madagascar and Tunisia** in adopting cultivation practices that improve the soil and have direct benefits for climate protection. Thus, more regular and bountiful harvests can be expected, even if extreme weather events happen. Advisory and training services have already reached over 167,500 smallholders. Close to 261,500 hectares of soil have been rehabilitated and yields have increased by up to 36 per cent per hectare.

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Rural Development and Agriculture Division G500
Friedrich-Ebert-Allee 36+40
53113 Bonn, Germany
T +49 (0) 228 44 60 - 3824
F +49 (0) 228 4460 - 1766
E naren@giz.de
I www.giz.de

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Author/Responsible/Editor, etc.

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