

REDUCING EMISSIONS, BUILDING RESILIENCE

Climate change affects, and is affected by, all economic and social sectors. The UN system supports a wide variety of national efforts to reduce GHG emissions and adapt to climate change. While UN agencies and programmes pursue many activities within their own mandates, increasingly they combine their respective expertise to support cross-cutting initiatives.

These joint efforts are also increasingly underpinned by the ability of Governments and UN organizations to leverage the new international climate institutions launched under UNFCCC. These mechanisms promote financing, technology, adaptation, emissions reductions, capacity-building and more. For example, the Convention's Clean Development Mechanism, the first international system to boost investment in developing-country projects for reducing emissions at low cost, has become a model for how to encourage innovative climate solutions. This includes solutions that engage civil society, provide co-benefits and stimulate sustainable development.

Some of the many ways in which the UN supports climate action can be illustrated through a few examples from some key sectors.

Low-carbon energy and energy efficiency

Coal, oil and gas have fuelled the world's industrialization and contributed enormously to economic development and human well-being. As a result, however, energy-related carbon dioxide (CO₂) emissions currently account for some two thirds of global GHG emissions. As the global economy expands, the total amount of CO₂ emitted by the energy sector continues to rise.



A village shop in Sri Lanka at dusk lit by solar lamps. © Dominic Sansoni/The World Bank

The rapid and large-scale deployment of low-carbon energy and major improvements in energy efficiency are, therefore, at the heart of successful climate action. This is why the UN has established a new, broad-based initiative to generate action and collaboration and ensure that the various arms of the UN coordinate effectively. UN-Energy is the inter-agency coordination mechanism that promotes coherence among the UN system's energy programmes and facilitates joint programming.

The Sustainable Energy for All (SE4ALL) initiative was launched by the UN and the World Bank Group to achieve a broad-based transformation of the world's energy systems. It engages the UN and other partners in supporting energy efficiency, renewable energy and universal access to energy. The initiative recognizes that to spur investment in sustainable energy, national policies and financial environments must be created that enable changes that the market alone will not deliver. Over 80 Governments from developing countries have joined the SE4ALL initiative, and most of them have initiated or completed rapid assessments to prepare for scaling up action in priority areas, undertaking strategic reforms where needed, and attracting new investments and financial support.

Under the auspices of UN-Energy, the International Atomic Energy Agency (IAEA) and the United Nations Department of Economic and Social Affairs have worked with the Energy Commission of Ghana to explore policy options for increasing the use of low-carbon energy. The study used the IAEA energy planning model to analyse the country's energy system, and it obtained data on renewable and other energy sources from a number of UN agencies. The focus of this particular study was on renewables, but it also included nuclear as an option. This enabled Ghana to explore alternative scenarios for developing a much bigger low-carbon energy sector based on different assumptions about costs, technologies and other variables. The same team of UN bodies assisted Sichuan Province, China, to conduct a similar study.

Agencies of the UN are also facilitating efforts to pursue sustainable energy using innovative new technologies. For example, the use of connected (or "smart") sensors in electricity grids is starting to make it possible to transform traditional electricity networks into "smart grids". When grids are made more intelligent, energy can be sent and used only when needed. This smarter energy network uses distributed energy resources and advanced communication and control technologies to deliver electricity more cost-effectively, with lower GHG emissions and the active involvement of customers. The International Telecommunications Union is developing UN technical standards to support this technology's availability on the mass market.

The International Labour Organization promotes low-carbon energy through its support to energy cooperatives and other member-based structures. Energy cooperatives generate and distribute affordable, low-carbon power while creating local jobs. They enable people to make their own decisions on the power they use and give a voice to those who have previously been excluded from energy services and decision-making.

International transport

Globalization and the growth of international transport have contributed significantly to higher standards of living across the world. Airlines now carry more than 3 billion passengers a year and



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expect to transport over 7 billion by 2030; they also carry 50 million tonnes of cargo. Maritime transport is the most energy efficient mode of mass cargo transport; in 2012 ships carried about 9.2 billion tonnes of cargo and over 2.1 billion passengers. Road vehicles also contribute to global emissions.

Emerging technologies and strategies are readily available for limiting emissions from the transport sector. The importance that the public puts on clean, affordable transport marks the sector out as a high-profile leader on climate action. Activities within the UN system focus on cross-border transport, but the improvements and goals pursued at the international level also have a positive impact on emissions from domestic transport.

The International Civil Aviation Organization is working with its member States, the aviation industry and other stakeholders to develop global partnerships and actions for reducing emissions. It has reaffirmed a collective goal of raising fuel efficiency by 2 per cent per year and to stabilize aviation emissions at 2020 levels. Agreed measures include promoting new aircraft technologies, improving operations, switching to alternative fuels, optimizing routes and developing a market-based measurement scheme for the sector. Recent innovations include a



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CO₂ certification standard for aircraft by 2016 and the development of national action plans on CO₂ emissions reduction.

The International Maritime Organization has adopted a suite of mandatory technical and operational measures for ships that entered into force in January 2013 under the International Convention for the Prevention of Pollution from Ships. These measures require new ships to be constructed according to a mandatory design index, which sets minimum and progressively strengthened energy-efficiency levels (CO₂ emissions per tonne-mile) for different ship types and sizes. Furthermore, ships are required to have a Ship Energy Efficiency Management Plan that assists in the identification of operational energy efficiency improvements. By 2050, the successful implementation of this framework could reduce CO₂ emissions from international shipping by up to 1.3 gigatonnes per year compared with the business-as-usual scenario.

Improved fuel efficiency and reduced emissions for private and commercial road vehicles are pursued through the World Forum for the Harmonization of Vehicle Regulations, whose work is supported by the United Nations Economic Commission for Europe (ECE). The Forum's efforts have led to substantial cuts of up to 90 per cent of key pollutants since the 1970s. In March 2014, the Forum adopted the first international test procedure for measuring CO₂ emissions from cars, thus allowing Governments around the world to accurately determine carbon emission limits. In addition, the UN regional commissions have collaborated on developing a modelling tool to assess CO₂ emissions from inland transport activities, including road, rail and waterways; the tool has been piloted by Chile, Ethiopia, France, Montenegro, Thailand and Tunisia.

Cities and human settlements

Half of the world's population already lives in urban areas, and the number of city dwellers is set to grow dramatically over the course of the century. Urban areas generate 80 per cent of global gross domestic product and are major contributors to climate change, accounting for 67–76 per cent of energy use and 71–76 per cent of energy-related CO₂ emissions. They are also home to the majority of people, infrastructures and socio-economic assets that must adapt to the changing climate.

At the same time, many cities are already providing leadership on the climate issue. Their administrations recognize that reducing emissions through the construction of more resilient buildings, efficient public transport networks and low-carbon energy systems yields immediate and significant economic and social benefits.

Recognizing the potential for reducing GHG emissions through improved energy efficiency in buildings, the ECE, UN-Habitat and the City of Vienna are promoting good practices for energy-efficient housing in the ECE region. They have gathered evidence demonstrating that technologies that are already available can reduce a building's energy consumption by 30–50 per cent without greatly increasing investment costs.

UN-Habitat is working with ICLEI Local Governments for Sustainability to promote a low-carbon transition for cities in emerging economies. The partners are working with selected local



Flooding in Kawerle, Kampala. © UN-HABITAT/ Nicholas Kajoba

governments in Brazil, India, Indonesia and South Africa to integrate low-carbon strategies into key sectors.

The World Bank Group's Excellence in Design for Greater Efficiencies Green Building Market Transformation Program seeks to encourage people to think about and value green buildings as practical and necessary and to make them more available in developing countries, including as low-income housing. The goal is to make the benefits of green buildings clearer for builders, bankers and buyers and to change behaviour and decisions accordingly.

To help cities better address the impacts of climate change, the United Nations Office for Disaster-risk Reduction and UN-Habitat have mobilized over 1 800 cities and local governments to commit to 10 essential policies to make their cities more resilient. To date, over 700 cities have assessed their own progress in implementation.

Paying for low-carbon and climate-resilient infrastructure investments is a constant challenge. The World Bank Group has developed a new capital investment planning initiative that helps cities develop strategies to make their infrastructure investments more "climate smart". The Group has also launched a series of workshops to help cities improve their financial management practices, a necessary step if cities are to increase their access to private capital for climate-related infrastructure projects. More than 30 cities have already participated in these "city creditworthiness" workshops. One participant, the city of Kampala, has already achieved impressive results, nearly doubling its own-source revenues after adopting practices discussed at the workshop.



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Fishermen carry nets back to their village in Mucoroge, Mozambique. © IFAD/ Alex Webb

Meanwhile, an inter-agency Task Team on Urban Risk Management and Climate-smart Cities, organized under the auspices of the United Nations High-level Committee on Programmes' Working Group on Climate Change, has begun to map tools and formulate a "One UN" approach to building urban resilience and fostering climate-smart cities.

Agriculture and food security

People whose livelihoods depend on farming, fishing, herding and forestry have a great stake in global action to mitigate climate change and boost resilience. Herders and subsistence farmers, particularly those living in areas exposed to water shortages, soil erosion, deforestation and land degradation, have few means to protect themselves from additional climate impacts. Fishing communities are, likewise, vulnerable to sea-level rise, ocean acidification and the displacement of fish stocks. Over 2 billion small-scale agricultural producers, many of them women, provide as much as 80 per cent of food consumed in much of the developing world. The resulting impacts on food security affect the wider community and can spill over into national and regional insecurity.

Facing these challenges without exacerbating global pressure on natural resources will require radical changes in how we manage our agricultural sectors, including crops, livestock, forestry and fisheries. Agriculture not only suffers the impacts of climate change, it contributes considerably

to global GHG emissions. New estimates by the Food and Agriculture Organization of the United Nations (FAO) show that GHG emissions from agriculture, forestry and fisheries have nearly doubled over the past 50 years and could increase an additional 30 per cent by 2050, unless greater efforts are made to reduce them. But agriculture also has the potential to be an important part of the solution.

Smallholders have traditionally drawn on indigenous knowledge and historical observations to manage the effects of climate variability. Today, however, the speed and intensity of change is undermining their capacity to do so. Innovative policies and investment programmes help smallholders to anticipate, absorb and recover from climate shocks and stresses. They need access to climate-resilient seeds, sustainable management practices, good infrastructure, markets, financial and insurance products, and weather and climate services. The Centre for Development and Environment, World Soil Information and FAO manage a database – World Overview of Conservation Approaches and Technologies – containing over 700 sustainable land-management technologies and approaches that can help farmers cope with climate change.

A collaborative effort between FAO, the International Fund for Agricultural Development (IFAD), the World Food Programme (WFP), the World Bank Group and others is supporting countries in addressing the impacts of climate change on food security. They exchange climate-risk information, assist Governments with reporting to UNFCCC on agriculture adaptation plans, and promote the Global Alliance on Climate-smart Agriculture for food security and nutrition. They help farmers, fishers, forest-dependent people and food-insecure communities to sustainably increase agricultural productivity, adapt and build resilience to climate change and mitigate GHG emissions. IFAD and FAO have also joined forces in forming the Global Partnership for Climate, Fisheries and Aquaculture.

A specific example of UN-system action is the FAO Transboundary Agro-ecosystem Management Project for the Kagera River basin in Africa, funded by the Global Environment Facility. This regional project assists Burundi, Rwanda, Uganda and the United Republic of Tanzania to restore degraded lands, sequester carbon and adapt to climate change. It promotes agricultural biodiversity and improves agricultural production, livelihoods and food security.

In addition, IFAD launched the Adaptation for Smallholder Agriculture Programme in 2012 to make climate and environmental finance work for smallholder farmers. The Programme provides dedicated financing to scale up and integrate climate change adaptation measures across IFAD's approximately US\$ 1 billion per year of agricultural investment programmes. For example, in Yemen the programme supports 550 villages to prioritize investment for water harvesting, drinking water management, land conservation, road rehabilitation and the adoption of renewable energy.

The humanitarian efforts of WFP are often a response to extreme events such as floods, storms and droughts. It therefore assists the most food-insecure people to build climate resilience through vulnerability assessments and early warning systems. It also promotes food security by, for example, providing tailored climate information to farmers and vulnerable communities through climate services and through innovative finance projects.



UN Photo/Albert González Farran

Natural resources management

Freshwater, forests, biological diversity and land are essential natural resources that are being severely affected by climate change. Higher temperatures are altering the distribution of rainfall, snowmelt, river flow and groundwater; triggering floods and droughts; and disrupting water sources. Climate-related damage is undermining the natural self-regulation that healthy ecosystems contribute to food production, clean air and flood control. In many regions declining rainfall is reducing the land's vitality. These climate impacts, combined with other human-generated stresses, are threatening to reverse previous efforts to alleviate poverty and advance sustainable development.

Poor natural-resource management also generates GHG emissions. Depending on how they are managed, forests can be either major emitters or major absorbers of CO₂ emissions. Forest loss accounts for up to 17 per cent of global CO₂ emissions, while soil erosion and desertification also contribute. The UN family is promoting ways both to reduce emissions and to adapt in this sector through a range of conventions, programmes and mechanisms:

- **The UN Programme on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD Programme)**, a collaborative initiative building on the convening role and expertise



of FAO, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) supports countries in developing nationally led “REDD+” strategies and capacities on these issues. Established under UNFCCC, REDD+ offers social, economic and environmental benefits by promoting economic growth, improving livelihoods, creating green supply chains, boosting food security, conserving forests and fighting climate change – all at the same time. The UN-REDD Programme cooperates with donor countries and the World Bank-facilitated Forest Carbon Partnership Facility, Forest Investment Programme and BioCarbon Fund.

Together, the UN-REDD Programme and World Bank mechanisms engage with over 60 countries that are home to the vast majority of the world’s forests. They bring together stakeholders at the national, regional and global levels to develop strategies that will benefit people and the planet. To date, they have channelled over US\$ 1.75 billion into support for national REDD+ action. Many countries are now taking bold steps to link REDD+ to the development of green economies and advancing innovative ideas for programmes to reduce forest emissions.

- **The United Nations Convention on Biological Diversity** promotes biodiversity and the sustainable and fair use of its benefits. Agencies and programmes of the UN are assisting the member Governments of this Convention to understand and combine action on both biodiversity and climate change under their work programmes. For example, the conservation or restoration of biodiverse habitats can remove CO₂ from the atmosphere and store it



Woman with water jug next to rain water collection tank, Sri Lanka. © Dominic Sansoni/ The World Bank

in biomass. Protecting or replanting mangroves can reduce the impacts of increased flooding and storm surges.

- **The United Nations Convention to Combat Desertification** addresses the degradation of drylands, which is being aggravated by climate change. With support from many parts of the UN system, the Convention promotes adaptation to climate change through measures to prevent erosion, improve soil structure and restore the land's resilience and productivity.
- **UN-Water**, an inter-agency coordination mechanism for freshwater issues, including sanitation, adds value to other UN programmes and projects by finding ways to encourage efficient and effective joint efforts by contributing organizations. Access to freshwater is essential to human life, yet it is under severe threat in many regions due to climate change.

Public health

Climate change is closely linked to some of the leading global health challenges of the twenty-first century. These include death and injury from extreme weather events, outbreaks of infections driven by heat, droughts and floods, and the spread of disease carriers such as insects and of respiratory illnesses from urban air pollution. Reducing pollution and strengthening local resilience to climate impacts bring large and immediate benefits. In addition to saving lives, this reduces health costs and increases social well-being and productivity.

Countries with weak public health systems, many of them in Africa, are at particular risk. Over 95 per cent of least developed countries (LDCs) identify health as a priority sector for adaptation to climate change, but less than 30 per cent have developed an adequate assessment or response to this challenge. Poverty and limited infrastructure combined with natural climate variability leave many people, particularly children and pregnant women, exposed to climate-sensitive diseases such as malaria and cholera. Warmer temperatures, changes in precipitation, diminishing water supplies, greater food insecurity, and more floods and droughts will only increase the risk of epidemics.

The UN system assists vulnerable countries to monitor, analyse and address climate and health challenges. It recognizes that effective climate policies are an integral part of successful long-term public health planning. For example, the Global Framework for Climate Services is a universal, intergovernmental partnership for promoting the production and use of climate information and services for decision-making on public health, disaster risk, agriculture and food security, and other challenges. The World Health Organization, WMO, WFP, the International Federation of Red Cross and Red Crescent Societies and others are collaborating through the Global Framework for Climate Services to assist, initially, Malawi and the United Republic of Tanzania to use tailored climate services to anticipate and respond to outbreaks of malaria, cholera and other diseases.

The UN also serves as the secretariat for the Climate and Clean Air Coalition to Reduce Short-lived Climate Pollutants. The Coalition brings together over 50 national, multilateral and non-governmental partners to reduce pollutants that affect both climate and human health. Black carbon



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and other particulates and gases, including carbon monoxide and ozone, contribute to approximately 7 million deaths every year. The Coalition assesses the health impacts and anticipated co-benefits of strategies to reduce such emissions. It supports tracking and monitoring systems linking Coalition initiatives to air pollution measurements. It assists countries to develop their capacity in this field and raises awareness of the health benefits of reducing short-lived pollutants. Recently, the Coalition's efforts received a boost when the ECE Convention on Long-range Transboundary Air Pollution adopted the first-ever emission-reduction commitments for black carbon.

Disaster-risk reduction

Between 2002 and 2011, over a million people lost their lives in natural disasters. Economic losses from natural disasters have risen from US\$ 50 billion each year in the 1980s to just under US\$ 200 billion each year in the last decade. Climate-related hazards are likely to increase in frequency, intensity, extent and duration. Meanwhile, economic progress, rapid urbanization and population growth combine to concentrate people, jobs and property in vulnerable areas.

International cooperation in disaster-risk reduction has been spurred by the internationally agreed Hyogo Framework for Action: Building the Resilience of Nations and Communities to Disasters 2005–2015. With Governments in the lead, the Framework has guided UN agencies and partners in civil society and the private sector in stepping up their efforts to build resilience to disasters at national and local levels. Around the world, UN country teams have integrated disaster risk and climate change into their assessments of development needs and gaps. As a result, most UN development assistance frameworks have prioritized disaster- and climate-risk reduction. This has contributed to steady, if uneven, progress in each of the Framework's five priority areas.

In 2013, the United Nations Chief Executives Board adopted the Plan of Action on Disaster-risk Reduction for Resilience as a common strategy for integrating disaster-risk reduction into the UN system's work at country level. The Plan includes commitments to ensure timely, coordinated and high quality assistance to all countries where disaster losses pose a threat to people's health and development.

At the global level, more than 10 UN entities plus the World Bank Group cooperate in preparing the Global Assessment Report on Disaster-risk Reduction, a biennial assessment of disaster-risk reduction and natural hazards. This report is based on national self-assessments of progress in implementing the Hyogo Framework for Action and is supported by national disaster damage and loss databases.

Because disasters and other climate impacts are projected to increase the displacement of people, the United Nations High Commissioner for Refugees (UNHCR) and the International Organization for Migration (IOM), in partnership with other UN organizations and non-governmental organizations, are implementing activities to prevent displacement through resilience strategies such as migration and planned relocation. For example, UNHCR, in partnership with the Norwegian Refugee Council Internal Displacement Monitoring Centre and with funding from the European Union, Norway and Switzerland, is implementing a project on "Climate change and displacement: Building an evidence base and equipping States with tools and guidance for action".



A European Union-funded project has been launched by IOM on “Migration, environment and climate change: Evidence for policy” to provide new evidence for policymaking on migration, environment and climate change. The project puts a particular emphasis on migration as an adaptation strategy. The IOM is also working with partners to deliver capacity-building and training to policymakers and practitioners working on climate, disaster-risk reduction and migration issues.

The preparatory process for the post-2015 framework for disaster-risk reduction was launched in 2012. Managed through the UN system, the framework will link together the related concerns of sustainable development, climate change and disaster prevention and preparedness.



In São Tomé and Príncipe, climate change brings severe and dangerous weather conditions. Increased fog, wind, and storms are particularly dangerous for fishermen, who traditionally fish in small, open sail boats and navigate by sight. An ongoing UNDP project, in partnership with the Ministry of Public Works and the National Meteorological Institute, and with financing from the Least Developed Countries Fund, aims to help develop more reliable early warning systems to monitor these increasingly severe hydro-meteorological conditions. © UNDP