



Federal Ministry
for Economic Cooperation
and Development

Climate change – Time to act

Climate policy in the context of the 2030 Agenda





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DEAR READER,

Mitigating climate change worldwide is the key issue for the survival of humankind. The challenges that climate change poses to industrialised, emerging and developing countries are huge. The main emitters of greenhouse gases are industrialised and emerging countries. Developing countries, on the other hand, are the worst hit by the impacts of climate change. Natural disasters such as Hurricane Matthew show the full force of how climate change can cancel out development progress.

Last year, meeting in New York, the international community adopted the 2030 Agenda, a global charter for the future. We thus now have, for the first time, a comprehensive framework for sustainable development on our planet that is underpinned by specific targets. The historic Paris Climate Agreement likewise establishes a clearly defined pathway. Taken together, the two agreements guide our endeavours to overcome poverty and hunger while reconfiguring economies and societies in a manner that mitigates climate change and boosts prosperity.

Yet negotiation outcomes are not in themselves sufficient. It is now time to act! A particularly important aspect of climate action is that the states parties rigorously implement the pledges they announced in Paris and actually reduce their greenhouse gas emissions. If they do not, we shall be unable to limit global warming to well below two degrees, and if possible to 1.5 degrees.

Many poorer countries need special assistance in that endeavour. They not only need to enter low-carbon growth trajectories, but must also arm themselves against the consequences of climate change, be they drought, flooding or cyclones. The people in the developing world are those most severely affected by such consequences. They need knowledge, technology and funding.

Rich industrialised countries bear special responsibility here – a responsibility that Germany continues to assume with vigour. We have the know-how and the technologies. The global energy transition from fossil fuels to renewable sources of energy must succeed. It is equally clear that the global climate goals can only be achieved if there is a global transition as regards transport, with new approaches to mobility and urban development being pursued. Forest protection, marine conservation and preserving biodiversity – safeguarding nature's global treasure troves – are further key fields of action for successful climate policy.

More than ever before, we view development policy as climate policy! Germany is already among the largest donors in this field, and about 90 per cent of the German contribution to international climate finance comes from the budget of the Federal Ministry for Economic Cooperation and Development (BMZ). By 2020 Germany aims to double public funding for climate action.

We make funding available both for tried and tested approaches, such as the promotion of renewables, and for innovative approaches such as climate risk insurance. In the following pages you can learn more about our diverse commitments to international climate policy.



Dr Gerd Müller, Member of the German Bundestag
Federal Minister for Economic Cooperation and Development



“ACT AND TRANSFORM. WE ARE MAKING THE PARIS AGREEMENT COME TRUE.”

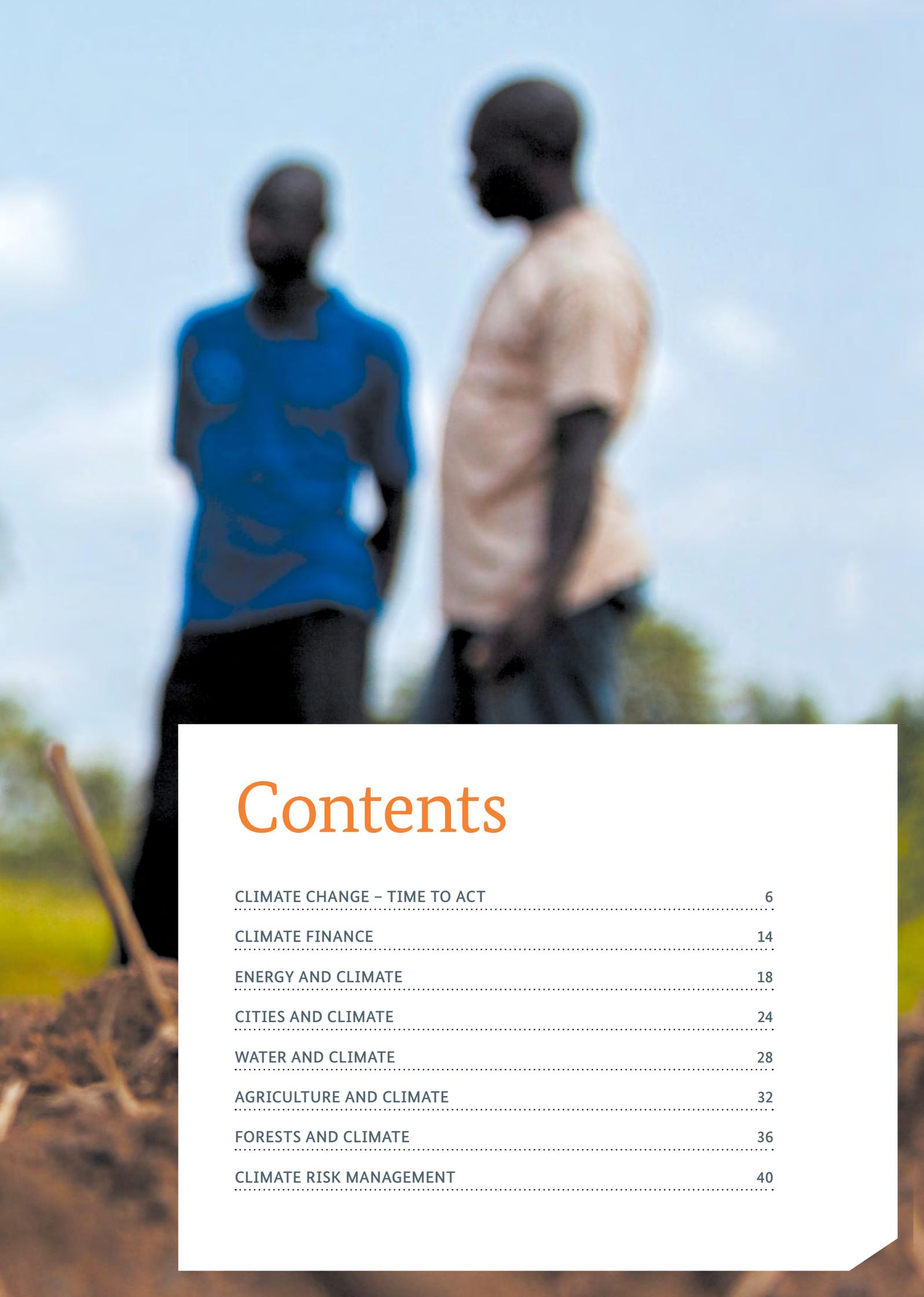
German Development Minister Dr Gerd Müller



Further information
in our web app

[https://www.bmz.de/webapps/
klima/#/en/](https://www.bmz.de/webapps/klima/#/en/)





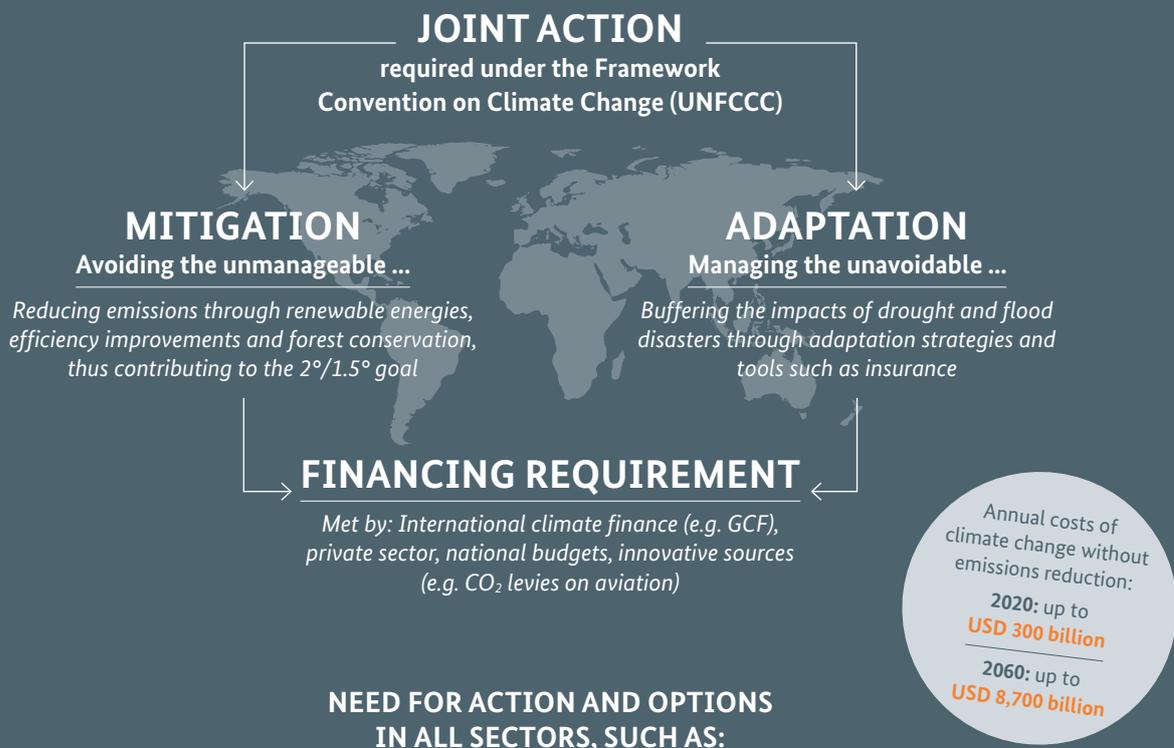
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Climate change – Time to act

Ban Ki-moon, Secretary-General of the United Nations from 2007 until 2016, describes climate change as the biggest challenge in the history of the human race, because it ‘threatens life and our existence’. This means, he says, that the world must take concerted action – and do so quickly and vigorously. The Intergovernmental Panel on Climate Change (IPCC) likewise warns that any delay in taking action to protect the climate will restrict subsequent options and drive up costs. In 2015 the international community created the political framework for this action by adopting the 2030 Agenda for Sustainable Development and the Paris Climate Agreement.

Climate change – a planetary boundary



CITIES



ENERGY



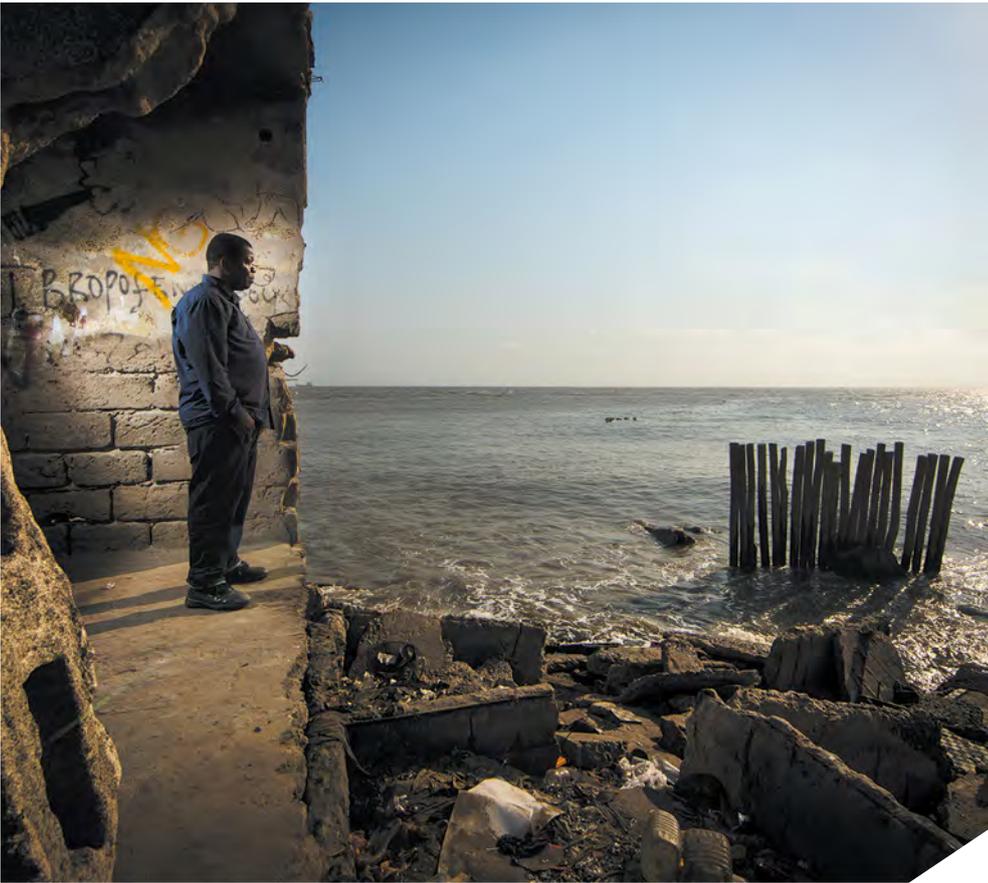
WATER



FORESTS



AGRICULTURE



- ← Rising temperatures cause rising sea levels.
- ↓ Flooding in Mozambique. People making their way to an emergency assembly point on the Save river.



A TARGET OF WELL BELOW 2°C

Climate change is largely man-made; it can be kept within manageable bounds only by rigorously cutting back greenhouse gas emissions. On the basis of scientific calculations, climate policy in recent years has set out to limit global warming to no more than 2°C above pre-industrial levels, and to 1.5°C if feasible. Beyond that limit, the consequences of climate change threaten to become irreversible and uncontrollable.

In the Paris Climate Agreement the international community has taken this a step further and resolved to limit the global temperature rise to well below 2°C, and if possible to 1.5°C. This more stringent target is influenced in particular by the interests of small island states whose very existence is under acute threat from global warming.

The new target is achievable – providing that the ever-increasing rise in global greenhouse gas emissions is rapidly reversed and anthropogenic emissions are neutralised by carbon sinks (such as forests and oceans). However, this requires radical technological, economic and institutional change.

CLIMATE POLICY IS ALSO DEVELOPMENT POLICY

Failing to achieve these targets would have devastating consequences: some scenarios predict that sea levels could rise by several metres and that sea temperatures would also increase. The oceans would become more acidic, causing widespread extinction of marine flora and fauna in some areas. Entire regions are or would be at risk of becoming excessively arid or could become uninhabitable on account of excessive heat. Food production in these regions would fall sharply.

Cities are also severely affected, as they are usually located in exposed locations on rivers and coastlines and heat effects are amplified there due to their densely built-up nature.

Even if we succeed in stopping temperatures rising to more than 2°C above pre-industrial levels, if possible 1.5°C, the world is going to change: some regions will suffer from water shortages (see the Water and Climate section), others from flooding. The countries most affected will be developing and newly industrialising countries; it is they who are hardest hit by the impacts of global warming.

Hard-won economic and social progress may then be undone; achievements in the war on poverty, hunger and disease and in the drive for more education are at risk. Inevitably, therefore, climate policy is also development policy. Climate change is no respecter of national boundaries. Its impacts are not limited to specific areas of policy, sectors of the economy or social groups – but poor population groups are particularly hard hit. It is therefore important not to lose sight of the many and diverse linkages when taking climate action.

Agriculture, for example (see the Agriculture and Climate section), is an important source of income for many people in developing countries, but it is coming under increasing pressure as a result of climate change. At the same time, agriculture is itself a major contributor to climate change through the felling of forests (see the Forests and Climate section) or emissions of methane in livestock farming. Urban areas compete with agriculture for water and food/animal feed; they are coming under increasing population pressure as people migrate to cities from the countryside, and they must find ways of harmonising action to protect the climate with growing motorisation and the creation of jobs. Steps must be taken to reconcile differing needs, create incentives for climate-friendly behaviour and promote opportunities for adaptation to climate change. German development policy contributes to all of these strands of action – and harmonises its activities with the guiding resolutions of the international community.

Our challenge



A SET OF TASKS FOR THE COMING YEARS

Shortly before the Paris Climate Conference, the international community, meeting in New York, adopted the **2030 Agenda for Sustainable Development** with its 17 Sustainable Development Goals (SDGs). The SDGs replace the Millennium Development Goals (MDGs) of the year 2000. Unlike the MDGs, they take account of the economic and ecological dimensions of sustainable development as well as the social ones. Another difference between the two is that the SDGs apply to every country in the world. With the 2030 Agenda the international community has thus created a charter for transforming the world that is to be implemented by industrialised and developing countries alike.

The **Paris Climate Agreement** makes explicit reference to the 2030 Agenda – thereby recognising the close links between the two. The fact that the 2030 Agenda contains a specific climate action goal (SDG 13) is another indication of the interdependence of the two documents.

The 2030 Agenda contains many goals relating to issues outside the climate sector. At the same time, some other SDGs involve climate goals: for example, urban development (SDG 11) is linked to the expansion of lower-emission public transport. Conversely, action designed to help agriculture adapt to climate change tends to impact positively on food security (SDG 2) and poverty reduction (SDG 1).

The 2030 Agenda and the Paris Climate Agreement thus highlight the fact that sustainable development, climate change mitigation and adaptation to climate change in fact form a single agenda: sustainable development makes societies more resilient to climate change and promotes the restructuring of national economies along climate-friendly lines, while without climate change mitigation and adaptation, progress towards development that has already been achieved may be undone and future progress put at risk.

In concrete terms this means that future development must be 'climate-smart'. To this end, most countries have now specified Nationally Determined Contributions (NDCs), which are at the heart of the Paris Agreement. It is for this reason that Germany – with a number of other industrialised and developing countries, the United Nations, the World Bank and the World Resources Institute – has set up a global **NDC Partnership**. The Partnership is intended to assist the implementation of the Paris Agreement and support the efforts of poorer countries to harmonise their climate and development goals, translate them into appropriate action and access development finance for this purpose.

WITH 7 POINTS BMZ TRANSLATES THE PARIS AGREEMENT INTO ACTION IN SUPPORT OF LOW-CARBON AND CLIMATE-RESILIENT DEVELOPMENT:



DECARBONISING THE ECONOMY

Decisive action is needed if the international community is to achieve its climate targets. Above all, the world must transition to a low-carbon economy. This is primarily a task for the energy sector, which is responsible for the majority of worldwide greenhouse gas emissions. The global energy transition must involve the progressive phasing out of fossil fuels by 2050 combined with large-scale expansion of renewables and improvements in energy efficiency. This energy transition needs to go hand in hand with a global transformation of transport systems. This can only be brought about through rigorous promotion of sustainable forms of transport, such as public transport, cycling and walking, and a shift to alternative vehicle propulsion systems. Agriculture and forestry are also responsible for a significant proportion of emissions. The reduction of greenhouse gas emissions (mitigation) in these three sectors, energy, transport and agriculture, must therefore be a central pillar of international climate action – and thus of German policy.

In concrete terms this involves accelerating the shift to energy from renewable sources such as sun and wind and doing more to promote efficient energy use. Climate-smart urban development and innovative infrastructure in urban centres (see the Cities and Climate section) can prevent additional emissions. At the same time, it is important to pursue the systematic conservation of forests in order to bind carbon. All of this takes place against a background of population growth in a world where – despite continuing efforts – one person in eight still lives on less than 1.9 US dollars per day.



TACKLING THE CONSEQUENCES

A comprehensive climate policy must not only cut greenhouse gas emissions but also consider the consequences of climate change. These consequences are unavoidable and often impact most severely on the least developed countries. In supporting adaptation to climate change, the German Federal Ministry for Economic Cooperation and Development (BMZ) therefore focuses on particularly poor and vulnerable countries.

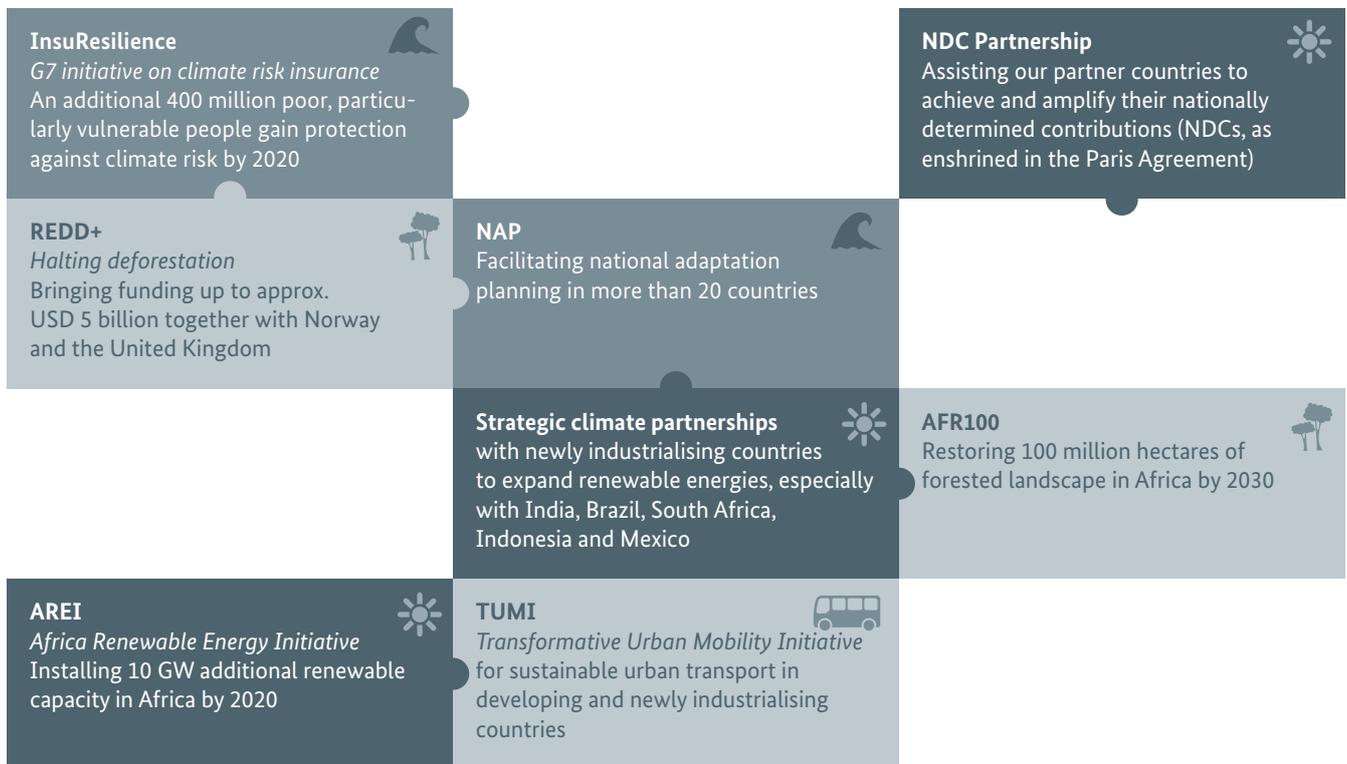
Adaptation to climate change involves, firstly, ‘no-regret’ measures that yield benefits even if the extent of climate change turns out to be less than was feared. Smarter irrigation in agriculture is an example of such a measure. Secondly, adaptation includes activities that specifically target certain climatic changes – such as setting up systems to monitor water levels and the climate.

In addition, decision-makers need specific knowledge in order to analyse climate risks and assess how and where investment in adaptation should be made. BMZ offers partner countries comprehensive support in this area – for instance in the form of advice, training and research & development.



- ↑ Harnessing solar power for cooking: The agricultural college of the Muni Seva Ashram in India uses steam generated by ten Scheffler solar cookers to cook the meals for its students.
- ← Wind farm near Zafarana in Egypt.

BMZ's initiatives with its partners



CREATING STRUCTURES

Developing partner countries' capacity to manage climate change is an important aspect throughout BMZ's work. For change to be effective in the long term, it must be embedded in appropriate political and legal structures, and strong institutions that can drive innovation forward must be created.

Within a country, regulation, planning and budgeting at national, regional and local level must be coordinated in order to reduce greenhouse gas emissions and counter the consequences of climate change. German development cooperation provides its partner countries with advice and support in bringing about this integration. For example, BMZ assists with implementation of Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs) in various countries, since these lay the foundation for promoting adaptation to climate change and decarbonisation of the economy.

NEW INITIATIVES

Since the adoption of the Paris Agreement, the German government has launched and supported some major initiatives. These include the Africa Renewable Energy Initiative (see the Energy and Climate section), which aims to expand renewable energy capacity in Africa; the G7's InsuResilience climate risk insurance initiative, which seeks to insure 400 million poor, particularly vulnerable people against the consequences of climate change (see the Climate Risk Management section); reforestation in Africa and financing for REDD+ (Reduced Emissions from Deforestation and Forest Degradation); and in particular the NDC Partnership to promote implementation of Nationally Determined Contributions in developing countries. Furthermore, at the Habitat III conference BMZ introduced the Transformative Urban Mobility initiative for sustainable urban transport in developing and newly industrialising countries.

The negotiations are over – for now. The policy framework for years to come has now been created; the initial goals have been formulated. It is now time to commence implementation. Successes achieved in realising the contributions pledged will improve the conditions for setting our sights even higher.

Putting Paris into action

NEW CLIMATE ACTION PARTNERSHIP

The Paris Agreement of December 2015 and the 2030 Agenda for Sustainable Development that was adopted earlier the same year are milestones in international climate and sustainability policy. For the first time, almost all the members of the United Nations have undertaken to make their own contributions to climate change mitigation in order to limit global warming to at most 2°C and if possible to 1.5°C. In these Nationally Determined Contributions (NDCs), participating countries specify their adaptation and emissions reduction targets for the period up to 2030. These NDCs will be reviewed and updated every five years, starting in 2020. The NDCs are at the heart of the Paris Climate Agreement. It is therefore vital that they are implemented quickly. This means that they must be translated into concrete policies and integrated into regulations, national budgets and investment plans – a challenging task.

In 2016 the German Federal Ministry for Economic Cooperation and Development (BMZ), the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and the World Resources Institute (WRI) set up a global NDC Partnership to help developing countries prepare to implement their NDCs.

The Partnership is open to all; its members include industrialised, emerging and developing countries as well as the World Bank and various UN institutions. The Partnership is supported by a secretariat located at the WRI.

The aim of the Partnership is help participating developing countries align their development objectives with climate action targets and implement their NDCs with the aid of bilateral and multilateral development programmes. It provides support in three areas:

- *knowledge management*
- *technical assistance*
- *access to finance*

Above all, the Partnership seeks to improve coordination between stakeholders in the climate and development sector by promoting dialogue between them at national and international level.

The German government is contributing the start-up funding for the Partnership's secretariat. BMZ is providing further support for the NDC Partnership through bilateral projects and international organisations. In addition, BMZ takes account of the NDC Partnership in its climate financing and climate projects in partner countries.



- ↑ Solar installation on the roof of the Alejandro Morera Soto soccer stadium in Costa Rica.
- ← Post-tsunami reconstruction: citizen input to the planning process. Simulation exercise in Aceh, Indonesia.

GLOBAL PARTNERSHIP TO IMPLEMENT NATIONALLY DETERMINED CONTRIBUTIONS (NDCS)

190 COUNTRIES have submitted nationally determined contributions (NDCs)



The **NDCs** are the pillars of the **PARIS AGREEMENT**:
Commitment by states to take implementation action
→ Regular review of achievement and continuous increase in ambition



NDC 
PARTNERSHIP

Initiators: BMZ, BMUB, WRI

OBJECTIVE: To assist developing countries in achieving, early on, ambitious NDC goals in accordance with their development objectives

**MITIGATION AND
ADAPTATION**

DEVELOPMENT



Effective, inclusive and timely NDC implementation to reduce
CO₂ emissions and adapt to climate change
→ Limitation of global warming to well below 2° C, if possible 1.5° C,
and abatement of the consequences of climate change

Climate finance

Climate change is already posing a threat to the development of the poorest countries and will make it far more difficult to achieve progress in future. Climate action and development policy are therefore inextricably linked. This is why BMZ seeks to help developing and newly industrialising countries undertake measures that contribute to the reduction of greenhouse gas emissions and promote adaptation to the consequences of climate change.



GERMANY, A RESPONSIBLE PARTNER

Development cooperation has an important part to play in enabling the global objective of decarbonisation in the course of the 21st century to be achieved. Therefore, it is vital to ensure that all finance flows – including private investment in all sectors of the economy, financial market transactions, foreign direct investment, etc. – are consistent with low-emission and climate-resilient development. The parties to the Paris Climate Agreement, which include Germany, have committed themselves to this in Article 2(1)(c) of the Agreement.

Germany has significantly increased its contributions to climate financing in recent years. In 2015 the German government pledged around 2.7 billion euros from budgetary sources for climate change mitigation and adaptation. This means that Germany has increased its commitments more than fivefold since 2005 (when the figure was 471 million euros). Approximately 90 per cent of these funds come from BMZ's budget.

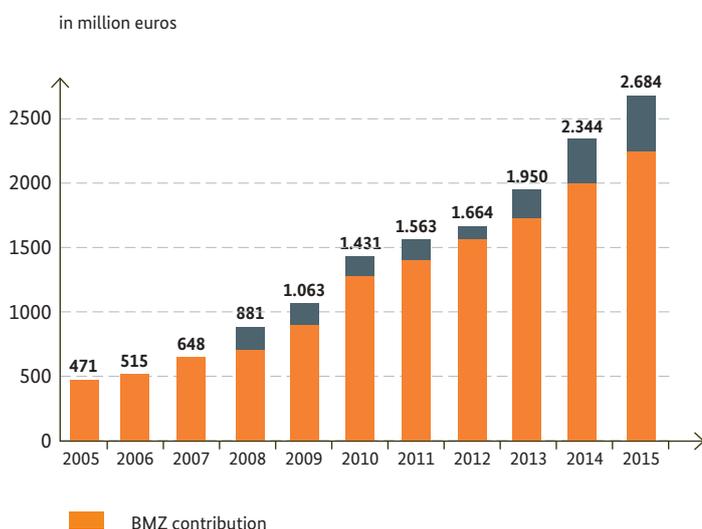
As well as providing climate financing from official budgetary sources, Germany also makes significant contributions by mobilising capital market funds. For example, in 2015 KfW Bankengruppe and its subsidiary DEG committed a further 4.7 billion euros in the form of development and promotional loans, shareholdings and other financing from capital market funds. Germany's public contributions to international climate finance in 2015 thus totalled 7.4 billion euros. Not least, the German government contributes to international climate finance by mobilising private capital.

GERMANY IS LEADING THE WAY

In 2009 the developed countries made a commitment to provide and mobilise, by 2020, an annual 100 billion US dollars from public and private sources for climate change mitigation and adaptation in developing countries. During the climate negotiations in Paris, that commitment was confirmed and expanded: a new financing target is to be adopted before 2025 that will exceed the current volume of 100 billion dollars.

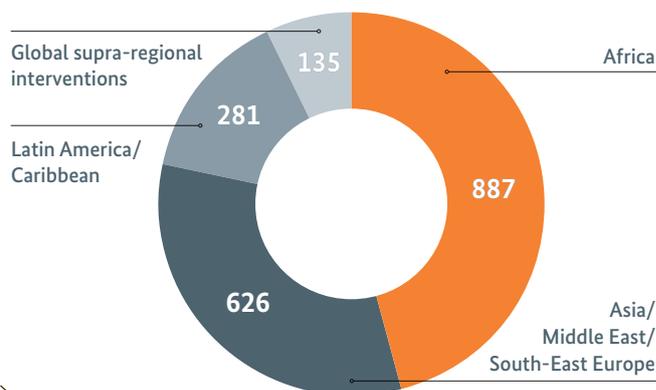
In 2014 the contributions of the developed countries totalled around 62 billion US dollars. To accelerate progress towards the target of 100 billion US dollars, the German chancellor Angela Merkel announced in May 2015 that the German government is aiming to double German climate finance by 2020. Germany is intending to thereby increase its climate financing from budgetary sources to four billion euros in 2020. In addition, Germany will provide further climate financing through public loans (via KfW and DEG) and by mobilising private funds. In making that announcement, Germany led the way: in October 2015 almost all multilateral development banks and many other countries, including France and the UK, announced that they, too, would be significantly increasing their contributions to climate finance. With this increase and the additional private funding that can be mobilised as a result, the target of 100 billion dollars by 2020 is now within reach.

German climate finance from public budget funds 2005–2015



BMZ's bilateral climate finance in 2015

by region, in million euros



BILATERAL COMMITMENT

Germany’s climate financing focuses on bilateral cooperation. In 2015, bilateral activities accounted for 86 per cent of German climate finance from budget funds. Most of the budget funds for climate finance – around 90 per cent – come from BMZ’s budget.

The Development Ministry supports climate change mitigation and adaptation projects in almost all its partner countries. Its activities are aligned with partner countries’ efforts to integrate climate action into their national development strategies. In addition, the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) supports extensive climate action through its International Climate Initiative (IKI). The Federal Ministry for Economic Affairs and Energy (BMWi), the Federal Ministry of Education and Research (BMBF) and the Federal Foreign Office (AA) also contribute to climate finance (BMWi 1.0 per cent; BMBF 1.5 per cent, AA 0.34 per cent).

Bilateral climate finance is being used for adaptation to climate change, reduction of emissions and forest and biodiversity conservation, including through REDD+.

MULTILATERAL COMMITMENT

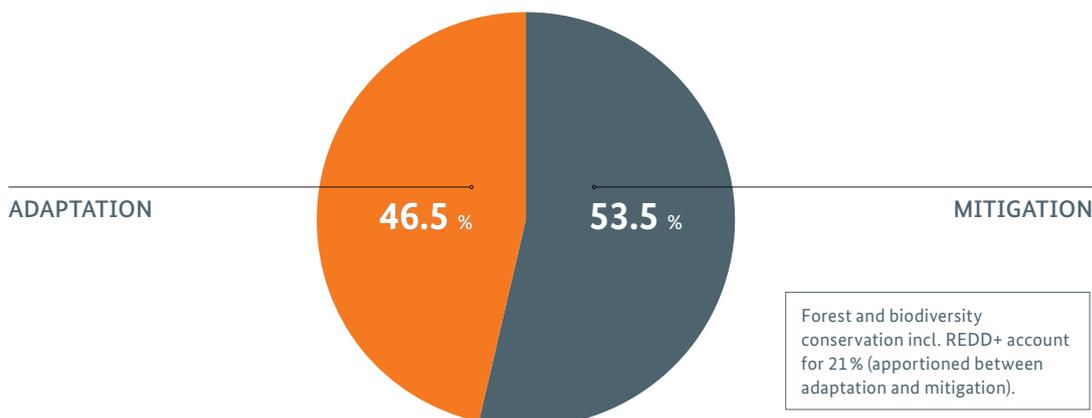
When large-scale change is needed, multilateral organisations are important partners: they implement programmes of significant scale and reach in developing and newly industrialising countries and can coordinate inputs from different donors. In addition, multilateral institutions often play a key part in policy dialogue at national and international level. To complement its bilateral activities in the climate sector, BMZ therefore pursues ambitious multilateral policies. The Ministry is a dedicated partner on the international stage, where it voices Germany’s positions and values in the field of development. Multilateral banks should act as global pioneers, in particular by making global financial flows consistent with low-emission and climate-resilient investment pathways.

BMZ works with the multilateral development banks to help put in place an enabling environment for effective climate policies. This also means the development banks need to take climate change issues into account in all their operations. Among other things, BMZ has successfully campaigned for the International Development Association (IDA), the World Bank’s financing instrument for the poorest countries, to mainstream climate change mitigation and adaptation in its core business.

Germany also makes significant monetary contributions to multilateral climate financing. For example, BMZ is the third-largest donor to the Global Environment Facility (GEF), after Japan and the United States. BMZ has so far paid more than any other donor into the Least Developed Countries Fund, the GEF’s fund for the poorest nations.

Distribution of BMZ’s bilateral climate finance in 2015 by sectors

(percentage points)



Fluctuations in the economy cause year-on-year changes in the breakdown between adaptation and mitigation. In 2014 the share of adaptation in BMZ’s bilateral climate financing was 53.4 %, that of mitigation accordingly 46.6 %.



- ← Plenary of an international GCF donor conference in Berlin.
- ↓ Hydropower for the state of Karnataka in India: dam near the town of Hassan, northeast of Bangalore. Large-scale hydro, with the associated dams, also has a role to play in renewable energy supply.



GREEN CLIMATE FUND

The central instrument for multilateral climate finance is the Green Climate Fund (GCF). BMZ has been contributing to the establishment of the Fund through strategic input, financial support and human resources. The mission of GCF is to bring about a new way of thinking and to facilitate the transition to low-emission, sustainable development. To this end, the Fund supports programmes that promote low-carbon economic development or make a substantial contribution to adaptation to climate change. Furthermore, the Fund will mobilise additional private-sector funding for mitigation and adaptation activities.

Germany has committed 750 million euros for the Fund's initial capitalisation. All of this funding comes from the budget of BMZ. Germany is planning to increase its contribution when the Fund is replenished.

USING CLIMATE FINANCE TO MAXIMUM EFFECT

The funding available for adaptation to climate change and reduction of greenhouse gas emissions is growing constantly. Yet many developing countries are finding it difficult to access international climate finance or to make effective use of such funding. The countries in this position are often the poorest and smallest states with weak government capacity, such as the small island states on which climate change impacts particularly harshly. This challenge is addressed by BMZ's Climate Finance Readiness Programme. It supports countries in building the technical and human resource capacity needed to make better use of international funding.

CLIMATE FINANCE READINESS PROGRAMME

Making funds available is only the first step in effective climate financing. It is also important to ensure that investment flows are effectively and efficiently managed. Partner countries must therefore be equipped to handle the tasks associated with applying for, managing and using the funds.

On behalf of BMZ, the Climate Finance Readiness Programme (CF Ready) helps countries access international funds and make effective use of national and international climate monies, such as contributions from the GCF. The CF Ready programme is administered

by KfW Entwicklungsbank and GIZ. Since 2014 GIZ has been supported financially in this by USAID and the Czech Environment Ministry.

The programme works closely with the secretariats of the major climate funds, such as the GCF and the Adaptation Fund. It currently operates in 15 countries: Bangladesh, Cambodia, Grenada, Jamaica, Morocco, Namibia, Peru, South Africa, St. Kitts and Nevis, St. Lucia, Tajikistan, Tanzania, Uganda, Viet Nam and Zambia. In future even more countries will receive support through KfW.

Energy and climate

More than two-thirds of harmful greenhouse gases are produced in the energy sector by activities such as transport, electricity generation, and heating and cooling for industrial and domestic purposes. This means that in the long term it will only be possible to keep global warming within the agreed limits by converting to low-carbon energy and improving energy efficiency.





← The Bondhu Chula cook stove, in use here in Bangladesh, saves fuel and prevents indoor air pollution.

At the same time, global demand for energy is rising: the International Energy Agency (IEA) predicts that it will increase by nearly one-third by 2040. There are currently more than 1.1 billion people without access to electricity; more than 700 million of them are in Africa. Another 2.9 million people depend on firewood, charcoal, dung or plant residues for cooking and heating.

There is no doubt that the world needs more energy. Energy is an important factor for economic and social development. Without it, industry cannot produce goods and create jobs. Energy is needed to grow and prepare food, heat homes and schools, run hospitals and provide clean drinking water. It underpins global communication and transport. Without energy, development is inconceivable.

Yet developing and newly industrialising countries currently depend in part on the expansion of fossil fuels to meet the rising demand for energy. Alternative opportunities must be created in order to advance the phasing out of fossil fuel use and reconcile the increased demand for energy with the need to mitigate climate change.

Social aspects such as the affordability of energy must also be addressed. Modern forms of energy based on renewables are often cheaper than inefficient single-user solutions such as diesel generators. However, restructuring energy supplies to make them 'greener' may in the short term impose additional costs on consumers. Advancing global development while also taking steps to mitigate climate change requires a sustainable, modern and affordable energy supply based on renewable sources and efficient use.

The 2030 Agenda makes it clear that climate and energy are key issues for the future of humanity. The energy goal (SDG 7) aims to expand renewables, create access to energy for all and increase energy efficiency. The climate goal (SDG 13) also calls for the expansion of renewable energy and greater energy efficiency. Energy is also a key element in the Paris Climate Agreement. In keeping with this, more than 90 per cent of countries have included energy-sector measures in their Nationally Determined Contributions (NDCs). In short: without the energy sector's contribution, the climate goals are unachievable.

SUSTAINABLE ENERGY FOR ALL

BMZ supports the expansion of sustainable energy systems worldwide. The German government is currently supporting energy projects in more than 70 partner countries. In 21 of these countries energy is even a priority area of cooperation. In 2014 and 2015 alone, BMZ spent more than four billion euros on developing sustainable and climate-friendly energy systems in different parts of the world. In terms of funding volume, energy is one of the largest single items in the German development cooperation budget – and its share is continuing to grow.

Germany's contributions focus on integrated approaches that consider the partner country's energy system as a

whole and promote the triple strands of renewable energy, energy efficiency and access to sustainable energy. This matches partner countries' need to increase energy supplies while also reducing greenhouse gas emissions.

Germany draws on its own experience of converting to a climate-friendly energy supply to assist partner countries in making this transition. What technologies have proved their worth? What legal framework should be put in place? What factors are – or are not – conducive to success? The insights Germany has gained can be applied elsewhere. This aspect alone makes it a committed and reliable partner in issues of renewable energy.

For example, German development cooperation is helping India realise its ambitious plans for the expansion of renewables. Through the Indo-German Energy Programme, Germany is advising the Indian partners on issues such as integrating the increased generation capacity from clean energy sources into the national grid. The areas of India with the greatest potential for renewables are at some distance from its industrial and economic centres. The electricity must therefore be transported to where it is needed. To achieve this, India – with German support – is currently establishing 'green corridors' that will supplement the existing energy grids and balance out regional differences.

German development cooperation is also supporting the expansion of renewables in South Africa. Through the ambitious Renewable Energy Independent Power Producer Procurement Programme it is helping to improve the enabling environment. In addition, BMZ has committed 300 million euros to expanding the country's electricity grids and is advising the national energy supplier ESKOM on the restructuring of its energy mix. South Africa now has 1,800 megawatts of renewable electricity generation capacity linked to the grid.

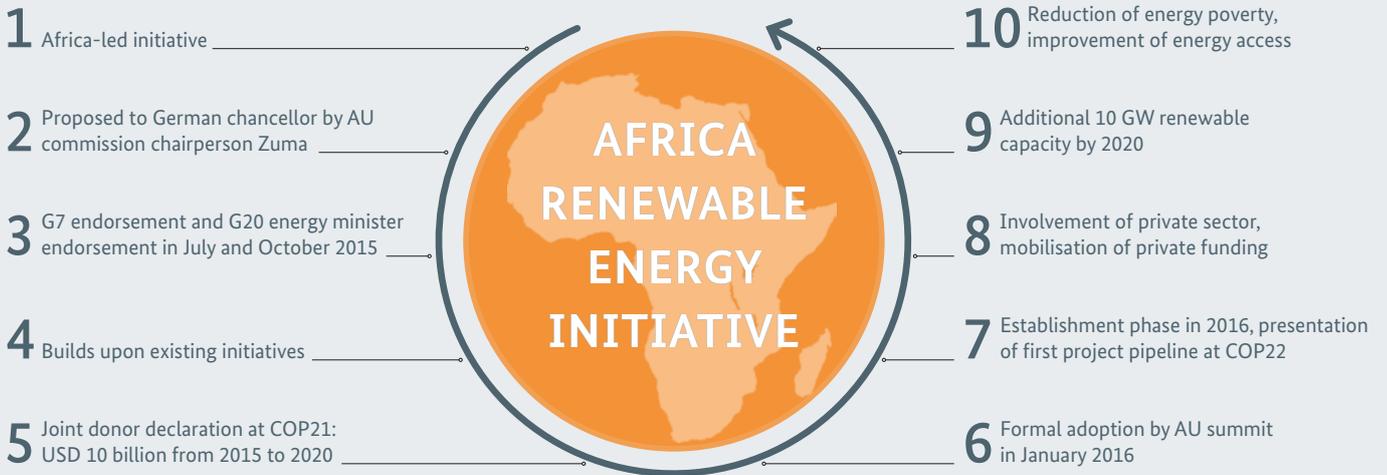
Even when it comes to energy access in rural parts of the world, the focus lies on electricity from renewable sources. This is the case, for example, in the remote West Nile region of Uganda, where, with German support, a small hydropower plant now meets the entire electricity needs of more than 60,000 people and many businesses. Construction of a second plant is planned. The electricity is transported via a new island grid. This improves the living conditions of local people and enables the local economy to develop without adverse impacts on the climate.



- ↑ Burkina Faso: two men making a fuel-efficient stove.
- ← Providing more than 800 million euros in interest-reduced loans, Germany is the main sponsor of the world's largest solar power plant in Morocco.

Up to 10 gigawatts of additional renewable capacity by 2020

AFRICA RENEWABLE ENERGY INITIATIVE

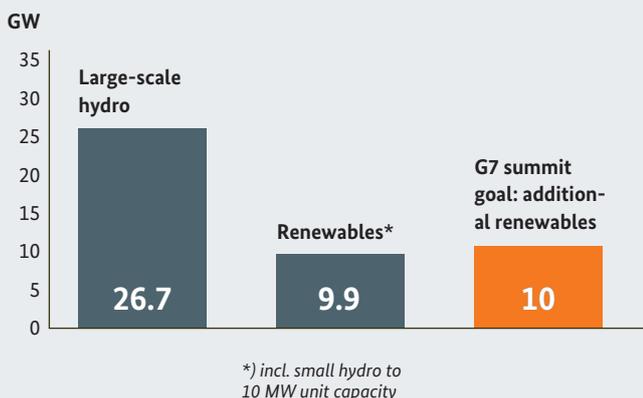


Together with other industrialised countries, Germany also supports the Africa Renewable Energy Initiative (AREI), which was initiated with the African partners at the G7 Summit in Germany in the summer of 2015 and founded at the World Climate Conference in Paris.

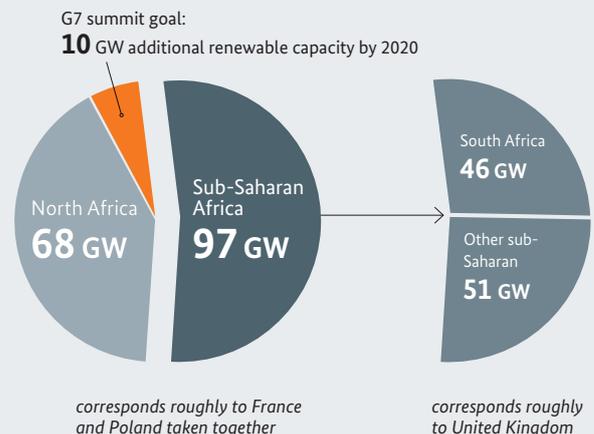
The AREI is an entirely African-led initiative that aims to install an additional ten gigawatts of renewable energy capacity by 2020. It is hoped that by 2030 Africa will have 300 gigawatts of renewable energy.

At the World Climate Conference in Paris, the G7, Sweden, the Netherlands and the EU Commission pledged ten billion US dollars to support AREI through existing bilateral and multilateral cooperation channels during the period to 2020. Germany is providing three billion euros of this – the largest contribution to AREI of any industrialised country. Germany is investing in the expansion of renewables, transmission and distribution, and technical cooperation on sustainable energy systems in Africa. It is currently supporting energy projects in more than 20 African countries through bilateral cooperation.

Total installed renewable power generation capacity in Africa in 2015



Installed power generation capacity (GW) in Africa in 2012





↑ Traditional three-stone hearths cause major energy losses. Biogas, energy-efficient stoves and solar cookers reduce both health impacts and resource consumption. Claire Namukasa blows into an open fire in Rakai district, Kagoma village, Uganda, while in her hut a modern RocketLorena stove is being built.

BILATERAL COMMITMENT – FACILITATING NATIONAL TRANSFORMATION PROCESSES

At bilateral level BMZ helps its partners create favourable conditions for a sustainable, future-oriented energy system and open up the market for renewable energy and energy efficiency products. German development cooperation provides advice on new laws, strategies, feed-in tariffs, tax rates and subsidy reforms. It assists with the establishment of energy agencies and trains local experts. It raises awareness through education campaigns and supports the dialogue between government representatives, business and civil society.

To enable the market for renewable energy to get going, BMZ provides many countries not only with know-how but also with capital. For example, credit lines for climate-friendly products are set up via national development banks. The purposes for which these are being used include energy-efficient domestic appliances in Mexico and energy-saving new buildings in India and various countries in Eastern Europe. Because banks in many countries still hesitate to provide loans for renewable energies or energy efficiency projects, such credit lines can do much to encourage further expansion.

One of the largest solar parks in the world is currently being built at Ouarzazate in Morocco; when completed it will supply green electricity to some 1.3 million people. Germany is providing reduced-interest loans totalling more than 800 million euros and is thus the largest supporter of the project. Further funds are being made available by the Clean Technology Fund (CTF), the African Development Bank and other donors.

MULTILATERAL COMMITMENT – WORKING TOGETHER FOR A SUSTAINABLE ENERGY FUTURE

At multilateral level, too, Germany works to support sustainable, climate-friendly energy systems. It focuses in particular on collaboration with international partners and initiatives such as the International Renewable Energy Agency (IRENA), the renewable energy policy network REN21, the Sustainable Energy for All (SE4All) initiative and the World Bank.

At European level the Africa-EU Energy Partnership (AEEP) provides an institutionalised platform for policy dialogue and cooperation between Africa and the EU. It enables European and African countries to work together to address challenges in the energy sector.

Cooperation in action I

ENERGISING DEVELOPMENT – ACCESS TO ENERGY FOR MILLIONS

Energising Development (EnDev), a programme operated by various international donors, is the largest global programme supported by German development cooperation. It is regarded as the world's most successful programme for promoting pro-poor access to energy supplies. Furthermore, it is having a demonstrably positive impact on the climate. BMZ is the leading donor and together with the Netherlands, Norway, Australia, the UK, Switzerland and Sweden it aims to provide at least 20 million people with access to modern, climate-friendly and affordable energy by 2019. EnDev is currently active in 26 countries, with an emphasis on the least-developed African nations.

EnDev promotes the expansion of renewable energy in rural areas and the upscaling of efficient and climate-friendly energy technology for use in households, social institutions and small enterprises. It develops private-sector markets in this field. This market-based approach not only reduces CO₂ emissions but also supports the local economy, creates jobs, generates income and reduces the health risks that – especially for disadvantaged groups – are often associated with traditional forms of energy. EnDev's measures reduce carbon emissions by more than 1.7 million tonnes per year – equivalent to the emissions of a city the size of Leverkusen or the reduction achieved by planting more than four million trees per year. In addition, efficient stoves reduce smoke particles and other short-lived climate pollutants. By reducing the demand for firewood, improved stoves also contribute to forest conservation.

↓ Solar-powered irrigation systems in Kenya.



Cooperation in action II

GEOHERMAL POWER IN EAST AFRICA – CLIMATE-FRIENDLY ENERGY FROM THE EARTH

The future of electricity generation in East Africa lies in the earth – because the potential for generating power from geothermal sources along the East African Rift Valley is enormous. Despite this, less than 20 per cent of the population have access to electricity.

Kenya and Ethiopia are currently the only countries in the region using geothermal resources to generate electricity. Exploratory drilling is expensive. Even after extensive preliminary geological investigations, the risk of failing to find a suitable resource is high. Many investors therefore shy away from geothermal power, despite the fact that – once tapped – it is a constant and low-cost source of energy.

It is for this reason that German development cooperation has set up a Geothermal Risk Mitigation Facility (GRMF), which now also receives financial support from the EU and the UK. This fund finances geological analysis of geothermal fields and exploratory drilling, thus reducing the financial risk to investors. Public and private geothermal power developers from eleven East African countries can apply for co-financing from the GRMF. The first developers started exploratory drilling this year. There is considerable interest in the scheme: the fourth application round started in June 2016 and has again attracted a large number of applicants.

↓ Geothermal power is a reliable, affordable and long-term source of energy for East Africa.



Cities and climate

In the mid-twentieth century just one person in three lived in a town or city. Today urban centres are home to half of the world's population, and by 2050 more than two-thirds of humanity are expected to live in an urban setting. There can be no doubt that this is the age of the city.



THE AGE OF THE CITY

But towns and cities drive global warming. They are already responsible for about 70 per cent of energy consumption and energy-related greenhouse gas emissions. Without a radical change of course, urban CO₂ emissions will only increase – not simply on account of urban population growth but also because of the higher concentration of activities in cities. Heavy traffic, widespread building construction and extensive urban sprawl, high energy needs and huge quantities of solid waste and sewage are all features of urban life.

However, cities are not only drivers of climate change but also victims of it. They are often located in exposed positions on coast, rivers, deltas or mountain slopes. At a time of climate change this makes them vulnerable: economic damage is likely to be particularly extensive and the poorer inhabitants are often entirely defenceless against extreme weather. Sustainable urban planning, investment in resilient infrastructure and the provision of urban green spaces can make a valuable contribution and significantly mitigate the adverse impacts of extreme events.

On account of their density, cities are also an ideal starting point in the battle against climate change: they can save resources on a huge scale and become a modelling ground for aspects of sustainability such as space-saving, compact and polycentric urban structures, low-emission transport facilities, energy-efficient buildings and regulated waste disposal systems.

Global climate goals can only be achieved by paying attention to cities, yet cities are also exposed to major risks as a result of climate change – these were among the issues discussed at the third United Nations Conference on Housing and Sustainable Urban Development (HABITAT III), which was held in Quito, Ecuador, in October 2016. At this conference the international community set out targets for sustainable urban development in a New Urban Agenda. As the eighth Secretary-General of the United Nations, Ban Ki-moon, pointed out, it is already clear that ‘cities are where the battle for sustainable development will be won or lost’. At the summit, BMZ described its transformative initiative for urban mobility as a first step towards realisation of this vision. With its partners, Germany is working to improve urban living conditions by promoting sustainable and affordable transport.



- ↑ Through the establishment of a rapid bus transit system, the inhabitants of Johannesburg's townships can now reach the town centre more safely and affordably.
- Road scene in San Jose, Costa Rica. The city is the country's political, economic and social centre, and its transport and telecommunications hub.



GERMANY'S COMMITMENT – SUSTAINABLE AND CLIMATE-SMART URBAN DEVELOPMENT

For BMZ, sustainable and climate-smart urban development means focusing on integrated approaches that emphasise cross-sectoral and multi-stakeholder solutions. For example, at national and municipal level German development cooperation promotes the development and implementation of urban development strategies that consider all aspects of mitigation and resilience in the face of climate change.

It stresses the need for climate-smart and resilient infrastructure in urban areas: three-quarters of German financial cooperation in the field of adaptation and more than half of German financial cooperation in the field of mitigation is focused on cities. In technical cooperation, too, around one-fifth of the volume of current climate change adaptation and mitigation projects is targeted at cities.



↑ Bangladesh: At a building site, a worker heats the bitumen needed to make asphalt for road construction.

→ India: Day labourers on a building site.



Cooperation in action I

ABATING EMISSIONS IN INDONESIAN CITIES

German development cooperation advises Indonesian cities on drawing up climate action plans. Successes in cutting greenhouse gas emissions through environmentally friendly waste disposal, energy-efficient conversion of street lighting or the expansion of the public transport system in individual cities are designed to serve as models for other cities.

For example, in Malang in Eastern Java a model street has been equipped with new street lighting that uses 60 per cent less electricity than the previous system. The initiative, which involves the lighting company OSRAM, also demonstrates how development partnerships with the private sector in the field of climate change mitigation can work. In addition, BMZ is supporting a programme to introduce a low-carbon solid waste management system in Indonesia, because most of the country's 400 landfill sites have hitherto been unregulated and are thus major sources of greenhouse gases. Financial support for the construction of landfill sites, sorting plants and composting facilities can reduce waste-related emissions by some 50 per cent.



↑ A joint effort: Projects to upgrade infrastructure and maintain roads also involve the local population in Bangladesh.



↑ Cutting CO₂ emissions and enhancing residential quality: EcoCasas in Mexico

Cooperation in action II

CLIMATE-SMART URBAN DEVELOPMENT IN KHULNA

Climate change poses particular problems for Bangladesh: one-fifth of the country could be left permanently under water as sea levels rise. On top of that, Bangladesh is already the most densely populated country in the world. The need to adapt is illustrated by the city of Khulna, which is home to 1.5 million people. Khulna lies on the banks of the Bhairab and Rupsha rivers in south-western Bangladesh, at a height of just two to four metres above sea level. On account of its exposed position the city is prone to severe flooding during the monsoon season. Because roads in Bangladesh frequently double as dams, they play a key part in flood protection. Germany is helping Khulna pave its roads and install drainage systems, with the result that parts of the city are no longer flooded for weeks at a time. Slum areas benefit particularly from this, because the improved roads mean that they are permanently connected to the transport grid; the inhabitants not only enjoy better protection from floods but have access to new economic opportunities.

Cooperation in action III

GREEN HOUSING IN MEXICO – LIVING BETTER AND SAVING ENERGY

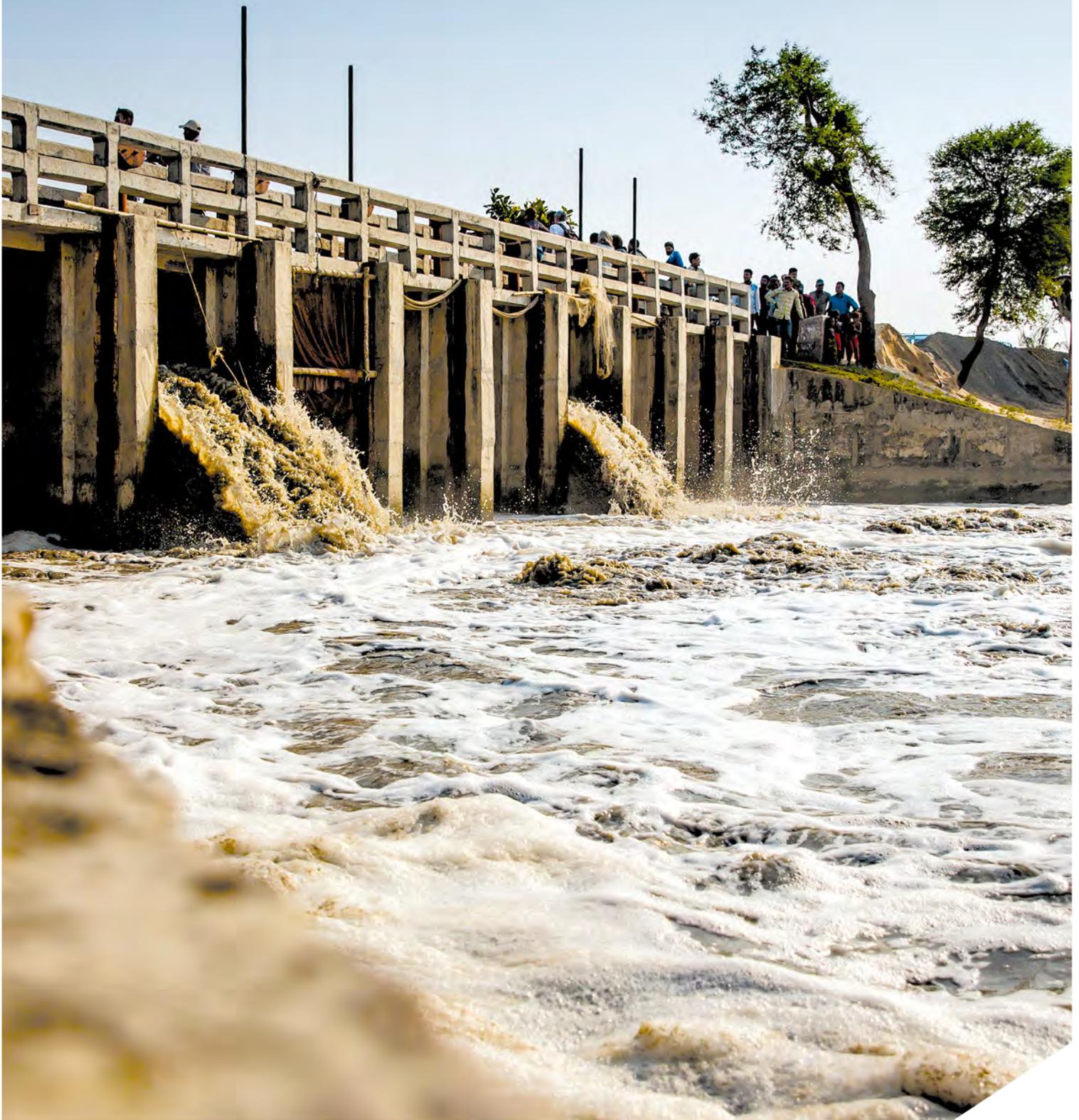
Half a million new housing units are built in Mexico every year; eight per cent of the population work in the construction industry. Energy consumption is rising steadily, with private households accounting for around 17 per cent of total usage.

This makes energy-efficient housing construction absolutely vital. The Mexican social housing development bank launched the EcoCasa programme, which it is implementing with the Inter-American Development Bank and German development cooperation. For the first time a variety of international funds – including the Clean Technology Fund (CTF) and the European Commission's Latin American Investment Facility – are putting up funding in a combined approach. Germany is providing low-interest loans of 80 million euros as well as investment subsidies.

The programme will run for seven years until 2020 and will mobilise about half a billion US dollars of private investment, which will be used to build more than 38,000 energy-efficient homes and 600 passive houses. These 'eco homes' use on average about 20 per cent less energy than conventional buildings. In consequence EcoCasa will save around one million tonnes of carbon dioxide emissions over the entire lifecycle of the houses. It is also improving the lives of many Mexicans who can now enjoy better-quality housing.

Water and climate

In water we see climate change in action. Whether drought or flood – both have adverse consequences for people and for nature. Yet water is essential for our existence and fundamental to all economic development. Above all, it is vital in agriculture, which is currently responsible for about 70 per cent of all water use.



Feeding a growing number of people will require even more water – or more efficient use of existing supplies. The demand for water is expected to increase by 40 per cent by 2030. Around 80 per cent of all sewage is discharged into the environment without treatment. Countries such as Viet Nam and Bangladesh regularly have to contend with floods, and heavy rainfall is a recurring problem in parts of Central America and Asia. Droughts and floods, water shortages and water surpluses: these contrasting phenomena are already a familiar experience in many regions of the world. Climate change will exacerbate incidents of both types, because adverse weather events are likely to become both more frequent and more extreme. The World Economic Forum now ranks water crises among the five most impactful global risks.

Extreme weather has a disproportionate effect on the poor, who often live in high-risk locations on steep slopes, along river banks or in areas vulnerable to drought. The water supply in Asia and Latin America depends partly upon sources in high mountain and glacier areas; the discharge patterns of such sources will change substantially.

According to the United Nations, by 2025 1.8 billion people will be living in countries or regions facing absolute water scarcity – with all this entails for their lives, for agriculture and for the world food supply.

It is not only the case that water-related events highlight the consequences of climate change; the use of water is itself an energy-intensive process that releases greenhouse gases. Using water efficiently – which includes reducing distribution and energy losses – is therefore another important element of climate change mitigation.

Furthermore, if effluents and faeces are managed inappropriately, this causes the release of the extremely climate-damaging greenhouse gases methane (CH₄) and nitrous oxide (N₂O).

→ Good water supply and sanitation are among the priorities of Germany's cooperation in Jordan's water sector.

GERMANY'S COMMITMENT – MANAGING WATER RESOURCES SUSTAINABLY

Even with changed climatic conditions, people everywhere should have constant access to a good water supply and sanitation facilities, and water resources should be managed sustainably. This is therefore one of the priorities of German development cooperation. A key requirement is that societies adapt to the effects of climate change – in other words, that they learn to cope better with floods, droughts and variations in the availability of water. Better planning of infrastructure to make it more climate-resilient is also essential.

In keeping with its priorities, Germany is one of the largest bilateral donors in the water sector; in Africa it is in fact the largest. BMZ supports projects and programmes with overall contributions that average between 350 and 400 million euros per year.

The annual costs of adaptation to climate change are estimated at up to 170 billion US dollars. This presupposes, though, that average global warming is kept to 2°C, if possible 1.5°C; if it is not, the costs will escalate. Much of the required investment is water-related: it is needed for dykes, various forms of water storage such as retention basins, protected freshwater ecosystems and groundwater recharge, wells, water channels and pipelines, and awareness-raising measures.

The challenges in the water sector are so immense that public funds alone are not sufficient. The German government therefore attaches great importance to cooperation with the private sector, in part as a way of mobilising larger sums of money for investment.



Integrated water resources management

Some time ago Germany adopted the principle of integrated water resources management, which is based on a coordinated approach to the different dimensions of water use and the various interests involved. It acknowledges the rights of affected communities as well as those of the local economy; ecological aspects are also considered.

However, this alone is insufficient to provide protection against the adverse consequences of climate change. How far will the water table fall? Is the reservoir the right size? Has the bridge been built high enough? Many outcomes cannot be forecast precisely. BMZ encourages ‘no-regret’ measures that yield benefits even in the absence of climate change by, for example, increasing water efficiency generally.

It also supports countries in their efforts to set up information and analysis systems and develop water-use plans that take account of climate change. For example, it is assisting the countries of the Arab League, Burundi, Uganda and Zambia, all of which are likely to face significant changes in rainfall and temperature.

The water – energy – food security nexus

Demand for food, water and energy is set to rise sharply in the coming decades; the pressure on ecosystems will increase. This is largely on account of world population growth, rising living standards and climate change.

In the light of this, German development policy is increasing its focus on the interactions or ‘nexus’ between the closely related sectors of water, energy and agriculture. For without water there can be no agriculture and no energy; without energy groundwater cannot be pumped and agricultural yields fall. The aim is to use resources as efficiently as possible and in ways that benefit multiple sectors, so that everyone has access to water, food and energy. For example, the pressure on freshwater resources can be reduced by reusing treated wastewater in agriculture or by using adapted irrigation methods such as drip irrigation. The end result is improved adaptation to climate change.

↓ Women working in the water to harvest seagrass in Tanzania.



- The water-agriculture nexus is one of the key themes of the water portfolio in Jordan.
- ↘ Water supply via cistern in Thulla, Yemen.



Cooperation in action I

ACTING TOGETHER TO MITIGATE WATER RISKS

Ensuring the fair and sustainable use of water is a challenging task that involves coordinating a number of different interests. To promote this, BMZ and the UK are supporting the International Water Stewardship Programme (formerly the African Water Stewardship Initiative). Ethiopia, Uganda, South Africa, Kenya, Tanzania, Zambia, Grenada and Saint Lucia are currently participating in the programme.

To reconcile divergent interests before conflict arises or water reserves are over-exploited, the programme involves a variety of groups including state agencies, representatives of civil society and private enterprises. These stakeholders work together to identify water risks, develop strategies to tackle them and implement appropriate measures, with the programme acting as an 'honest broker' between different interest groups. This generates trust among all participants and makes successful collaboration more likely.

Some 23 public institutions, 22 private businesses, ten NGOs and various community groups are already involved in this constructive approach to problem-solving. The private sector also contributes financially. For example, Coca Cola is funding projects in Tanzania and Uganda that will ensure that the Mlalakua and Rwizi rivers are better protected against the consequences of climate change. BMZ is contributing around six million euros to the programme, which will benefit more than one million people directly by 2018 and another seven million indirectly.

Cooperation in action II

FINDING ALTERNATIVES, BOOSTING EFFICIENCY

Rapid economic growth and swiftly expanding populations in recent decades have had an adverse impact on water resources in the countries of North Africa and the Middle East. The problems are particularly acute in Jordan, one of the world's most arid countries, where climate change and an influx of refugees are adding to the pressure on water resources. Agriculture is responsible for well over half of the country's water use.

German development cooperation is therefore advising Jordan on reducing water losses and establishing alternative sources of water for farmers. One option is to use treated wastewater. Today Jordan's farmers use treated wastewater to meet more than one-fifth of their needs – and this is set to increase, with Jordan planning to double the use of such water in the coming years. This eases the pressure on the country's overburdened freshwater reserves and improves water supplies for almost 700,000 people. Suppliers of drinking water are also being helped to make their operations more effective and efficient. This reduces water losses and promotes more efficient resource management. Campaigns and initiatives in schools and mosques, and training courses for water sector staff all encourage more careful use of water. German development cooperation is also piloting systems that will promote better wastewater management.

Germany is helping Jordan improve energy efficiency in the water sector: the Jordanian water sector is the country's largest single power user, accounting for 15 per cent of electricity consumption. Modernised pumping stations in selected districts have already reduced energy consumption there by one-third. There are plans for the entire country to adopt the same methods. The example of Jordan shows that integrated solutions based on the nexus approach can deliver positive results.

Agriculture and climate

Agriculture and climate change are connected in two important ways. Firstly, rural areas are particularly vulnerable to the effects of climate change: when water becomes scarcer, torrential rainfall becomes more frequent or crops fail to flourish under changed climatic conditions, this has repercussions on harvests and yields.





← Women in Tanzania at their market stalls.

According to a recent United Nations estimate the world's population is expected to increase from 7.3 billion in 2015 to 9.7 billion in 2050. Most of this growth will occur in developing and newly industrialising countries, which at the end of the century will be home to an estimated 87 per cent of the global population. Even today about 795 million people go hungry. Another two billion people are malnourished. They suffer from 'hidden hunger': their diet contains sufficient calories but insufficient nutrients. To enable the planet to feed nearly ten billion people by the middle of the century, global food production will have to be increased by about 60 per cent.

Climate change is making this challenge even greater. In Africa, in particular, falls in productivity are to be expected, e.g. 5% for maize and 17% for grain. Most ecosystems are already so disturbed by human influences that their response to climate change is highly sensitive. The combination of extreme climate situations (heat waves, droughts, floods, forest fires, severe storms) coupled with long-term developments (rising temperatures, changed precipitation patterns, etc.) is already having an impact in various regions of the world on harvest yields and on food production.

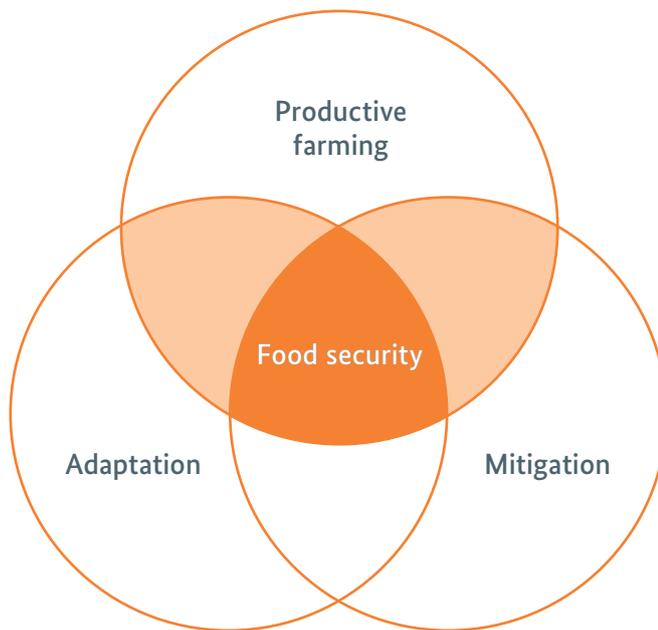
At the same time agriculture also contributes to greenhouse gas emissions – for example, when forests are cleared to create farmland. Agriculture is in fact by far the largest driver of deforestation. Cattle farming and certain production methods, such as paddy cultivation of rice, also release greenhouse gases – in this case methane. Excessive use of mineral fertilisers, heavy tillage and the conversion of grassland into cropland are other practices that are detrimental to the climate. Agriculture is thus part of the problem, but also part of the solution.

FOSTERING CLIMATE-SMART AGRICULTURE

To achieve this, it is essential that climate policy and food security goals are compatible. More than 90 per cent of countries mention the agricultural sector in their Nationally Determined Contributions (NDCs) under the Paris Agreement. Ninety-four per cent of developing countries have formulated NDCs that involve adapting agriculture to the consequences of climate change, primarily in crop and animal farming and forestry. Some seventy per cent of developing countries have identified measures for reducing greenhouse gas emissions in agriculture. Agriculture therefore plays a key role both in adaptation to climate change and in climate change mitigation.

In keeping with this, BMZ sets out not only to boost productivity but also to promote the adaptation of agriculture to climate change and – where appropriate and possible – the reduction of agricultural greenhouse gas emissions. The term 'climate-smart agriculture' is used to describe approaches that aim to increase productivity – for example by growing drought-resistant, early-maturing crops and using efficient irrigation methods – without converting additional (forested) land.

Climate-Smart Agriculture (CSA)



What we are doing

Success in this area can only be achieved if it is based on adequate data about the consequences of climate change for agriculture. BMZ therefore supports the international agricultural research centres of the Consultative Group for International Agricultural Research (CGIAR) in their research into the effects of climate change on agriculture.

In addition, German development cooperation helps political decision-makers adapt their policy planning and management to take account of the changes faced by rural areas as a result of climate change; it also assists them with access to climate financing. Developing capacities for implementing climate-smart agriculture plays a central role at all levels from policy-making to the individual smallholding. For example, BMZ is supporting the smallholder adaptation programme of the International Fund for Agricultural Development (IFAD), which covers all the above-mentioned action areas, with a contribution of 13 million euros.

Raising yields while mitigating climate change

In addition, German development cooperation is involved in efforts to maintain and increase harvests in countries such as Ethiopia – where agriculture generates half the country's gross domestic product but where some farmers continue to use inefficient cropping practices. With money from the Global Environment Facility (GEF) and financial support from BMZ, the World Bank is promoting a sustainable land management programme in Ethiopia. Measures such as erosion control, changed crop rotation and more efficient water use have already enabled more than 200,000 hectares of degraded land to be returned to agricultural use. This increases production, secures harvests even in arid years and thus boosts farmers' incomes. All in all, it is making rural households more resilient to the impacts of climate change.

A similar goal is being pursued by a project in Mali, where small-scale dams are being built to make better use of the rainfall that has become so unpredictable. This has enabled smallholders to produce several harvests a year and thus withstand climate change. The extensive experience of German development cooperation has now been incorporated into a national small-scale irrigation programme in which the government and various donors are collaborating.

Finally, Germany is also working to improve the marketing of agricultural products, for example through cooperatives or by connecting productive but remote farming regions to the road network and local and regional markets, thereby making it easier for farmers to transport their rice and vegetable products to the nearest market. This not only generates additional income but facilitates access to a better and more varied diet. Overall BMZ aims to promote comprehensive and climate-smart development of smallholder farming – from the field to the plate.

Cooperation in action I

INDIA – LEARNING TO COPE WITH CLIMATE CHANGE IMPACTS

In many rural parts of India, the adverse impacts of climate change are already a harsh reality rather than a mere threat. The monsoon is arriving later; rainfall is becoming more irregular. Heavy rainfall and droughts are increasing.

German development cooperation is operating a programme in the Indian states of Telangana, Andhra Pradesh, Odisha and Chhattisgarh to mitigate the consequences of climate change by combining sustainable soil conservation techniques with more efficient water use. The programme's activities include rehabilitating degraded soils, controlling erosion, constructing water storage systems, modifying fertiliser use and improving crop rotation. For example, fruit trees that are better able to cope with the irregular rainfall are being planted on slopes where erosion is a potential problem.

Farmers cannot influence the quantity or frequency of rainfall, but they are learning to live with the changed circumstances and to manage the consequences of climate change more successfully. This is reflected in their income: as a result of the measures they are earning between 20 and 50 per cent more.



↑ Banking for the poor – for many people a small loan is the first step towards having their own herd.

Cooperation in action II

BENIN – NOVEL CROPPING METHODS UNDER CLIMATE CHANGE

Until recently, farmers in the north of Benin could rely on receiving sufficient rainfall. Additional artificial irrigation was not needed. Only 0.5 per cent of agricultural land, located in floodplains, was cultivated with the help of small-scale irrigation methods.

But according to climate forecasts, precipitation in the region is likely to become increasingly irregular, with drier periods alternating with very heavy rainfall. This increased variability impacts adversely on the availability of water and hence on agricultural yields; food security throughout the region is therefore at risk.

To counter this threat, Benin – with the support of BMZ – is working to improve the management of water and soil resources, for example by introducing simple irrigation systems and techniques, and to make the population aware of the changes that they face. All these measures are designed to help agriculture in northern Benin adapt to climate change.

↓ Discussion round on climate change with the village people, Materi community, Benin.



Forests and climate

Forests are veritable treasure troves of nature. They provide food, water, raw materials for building and other purposes, fuel and medicinal plants – as well as living space for millions of people. And they are home to about 75 per cent of all known plant and animal species. The ‘lungs of the world’, as forests are sometimes known, produce oxygen, bind carbon dioxide and thus have a major influence on the Earth’s climate. They store water and help regulate temperature and rainfall. In short, forests are vital to the survival of the human race.



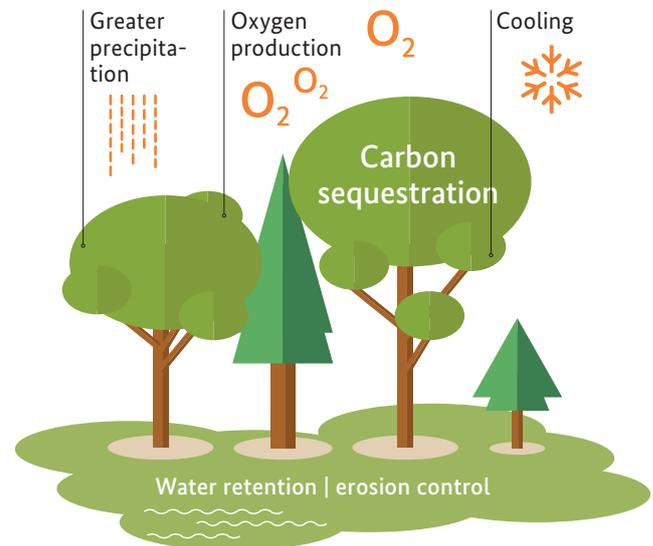
Yet some seven million hectares of forest – an area the size of Bavaria – are lost every year. Much of this deforestation occurs in the tropics. Thanks to the efforts of the international community, the rate of forest loss has slowed since the 1990s, but given the importance of forests for the environment and the climate it is still cause for concern.

According to the Intergovernmental Panel on Climate Change (IPCC), around 11 per cent of greenhouse gas emissions arise from forest loss. Climate change mitigation and forest conservation must therefore go hand in hand. Global warming cannot be limited to 1.5°C or even 2°C unless forest loss is halted.

GERMANY'S COMMITMENT – COMBINING FOREST CONSERVATION WITH SUSTAINABLE USE

BMZ has long been committed to international forest protection and conservation endeavours and is among the largest donors in this field. It focuses in particular on strategies for combining forest conservation with sustainable use. Logging and over-exploitation of natural resources are usually driven by economic factors. In the long term, it will be impossible to preserve forests unless other forms of forest use and alternative sources of income for the rural population are identified. Through financial and technical cooperation, BMZ is currently providing over 1.5 billion euros for more than 200 forest initiatives in more than 30 countries and ten regions. Support currently focuses on sustainable forest use coupled with climate change mitigation and biodiversity conservation. It will be extended in future to other strategic areas including REDD+ (Reducing Emissions from Deforestation and Forest Degradation), Forest Landscape Restoration (FLR) and deforestation-free supply chains.

The functions of forests for the climate



Compensation for forest conservation

The international community has for some years pursued the REDD+ approach, which links forest and biodiversity conservation with climate change mitigation. The principle behind REDD+ is that governments and local communities are rewarded for preventing deforestation and for verifiable emissions reductions. Afforestation and better forest management are also rewarded, because they improve the forest's carbon storage function. The activities supported by Germany range from small individual projects to national programmes.

However, no money is paid out until concrete services have been performed – in the form of measurably reduced deforestation. This requires a monitoring or accounting system, and Germany is helping many countries to introduce such a system, for example through the Forest Carbon Partnership Facility (FCPF), which numbers BMZ among its three largest donors. The FCPF is helping almost 50 countries lay the foundations for REDD+ and through its carbon fund it can make payments for verified emissions reductions as a result of prevented deforestation. The Facility operates as a learning platform and a pioneer of global quality standards; it also paves the way for possible REDD+ financing through the Green Climate Fund (CGF).

The German government is among the most important donors to REDD+ and has already invested significantly more than five hundred million euros in the scheme. It

← Eucalyptus seedlings in a village tree nursery in Madagascar. The seedlings of *Eucalyptus camaldulensis* need nothing other than rain, grow rapidly, are resistant and are undemanding upon soil quality.

currently supports bilateral projects and programmes that promote the conservation and sustainable use of forests in a number of countries including Brazil, Indonesia and Cameroon. Viet Nam is another country in which German development cooperation is active. Vietnamese farmers who replant woodland or use the forest sustainably receive USD 250 per hectare, which is paid into a ‘green’ savings account. More than 100,000 families are participating in the programme and several hundred thousand hectares have now been reforested.

For pioneer countries, BMZ has refined and upgraded the REDD+ approach. Through the REDD Early Movers (REM) scheme it supports countries that forge ahead and take sustainable forest conservation seriously; it has so far provided almost 60 million euros from the BMZ budget for this purpose. The programme assists REDD+ pioneers that have already taken financial and political steps to link forest conservation and climate change mitigation. It will in future be extended to other countries in Latin America and Asia.

Restoring forests

Alongside the conservation of existing forests, the rehabilitation of deforested or degraded forests and wooded landscapes (Forest Landscape Restoration – FLR) plays a significant part in reducing global greenhouse gas emissions. The African Forest Landscape Restoration Initiative (AFR100) was launched at the 2015 Paris Climate Conference by BMZ, the New Partnership for Africa’s Development (NEPAD) and the World Resources Institute (WRI). The initiative aims to

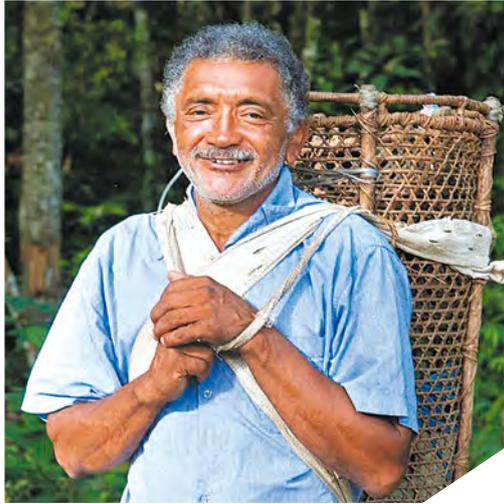
restore 100 million hectares of forest in Africa by 2030. So far 13 African countries have announced their intention to join the scheme: between them the Central African Republic, the Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mozambique, Niger, Rwanda, Togo and Uganda plan to restore more than 46 million hectares of forested land.

The initiative is supported by international donors such as the World Bank, the private sector and NGOs. The AFR100 partners have undertaken to provide more than 1 billion US dollars in development funds and 545 million US dollars in private financing.

In addition, AFR100 is an element in important international agreements on the restoration of forest landscapes. In 2011 the international community pledged in the Bonn Challenge to restore 150 million hectares of degraded forest by 2020. In the New York Declaration on Forests of 2014 this target was extended to 350 million hectares – an area roughly the size of India – by 2030. It was also agreed in New York that global deforestation should be halved by 2020 and completely halted by 2030. The German government explicitly supports both agreements.

↓ Mangrove afforestation in Costa Rica.





↑ Village elder Mauro Barbosa de Oliveira works for the COMARU cooperative in the community of São Francisco do Iratapuru in the Amazon region, Brazil.



↑ Traditional longhouse in Setulang village, North Kalimantan, Indonesia.

Cooperation in action I

REDD EARLY MOVERS IN BRAZIL – REWARDING FOREST CONSERVATION PIONEERS

The Brazilian state of Acre is leading the way as an Early Mover in the REDD+ programme, the international forest conservation scheme that was launched in 2005.

The Acre state government has steadily developed the institutions and instruments needed to protect its forests and implement REDD+ and has enshrined them in state legislation. Its activities have been successful and deforestation has been declining since 2006. Acre has now cut the rate of deforestation by 60 per cent and in 2015 it was responsible for only around four per cent of the logging that took place in the Brazilian Amazon.

The REDD Early Movers programme makes payments to pioneers such as Acre for verified emissions reductions. The German government's Energy and Climate Fund is making 25 million euros available for this purpose. Successfully avoided deforestation is recorded and paid for via a detailed accounting system.

The majority of payments are made direct to smallholders, local forest communities and indigenous peoples; the remainder is invested in government measures to conserve forests and reduce deforestation. Local people are therefore among the beneficiaries of this particular form of benefit-sharing.

Cooperation in action II

INDONESIA – TOWARDS A BETTER UNDERSTANDING OF 'GREEN' FORESTRY

Indonesia has some of the largest rainforests in the world. However, about a million hectares are destroyed each year, mainly in order to extend oil palm plantations.

One of the aims of the FORCLIME (Forests and Climate Change) programme that is being implemented by German development cooperation and the Indonesian Ministry of Environment and Forestry is to help create the political and institutional conditions for a change of attitude.

In addition to training the staff of forest agencies, it plans to set up forestry offices based on the German model. These offices would be put in charge of a particular area of forest and involve local people in managing it sustainably. Support is also being provided to private forestry businesses to enable them to manage the forests in accordance with international certification standards. FORCLIME aims to promote understanding of the role of forests in a green economy.

Indonesia now has 120 new forest offices with responsibility for 16 million hectares of forest. All state forests are due to be incorporated into the forest office system by 2020. In addition, forestry authorities in three districts are working with the local population on the running of pilot REDD+ projects covering some 380,000 hectares of forest. With funding of more than 81 million euros, FORCLIME is one of the largest externally financed forest conservation and biodiversity programmes in Indonesia.

Climate risk management

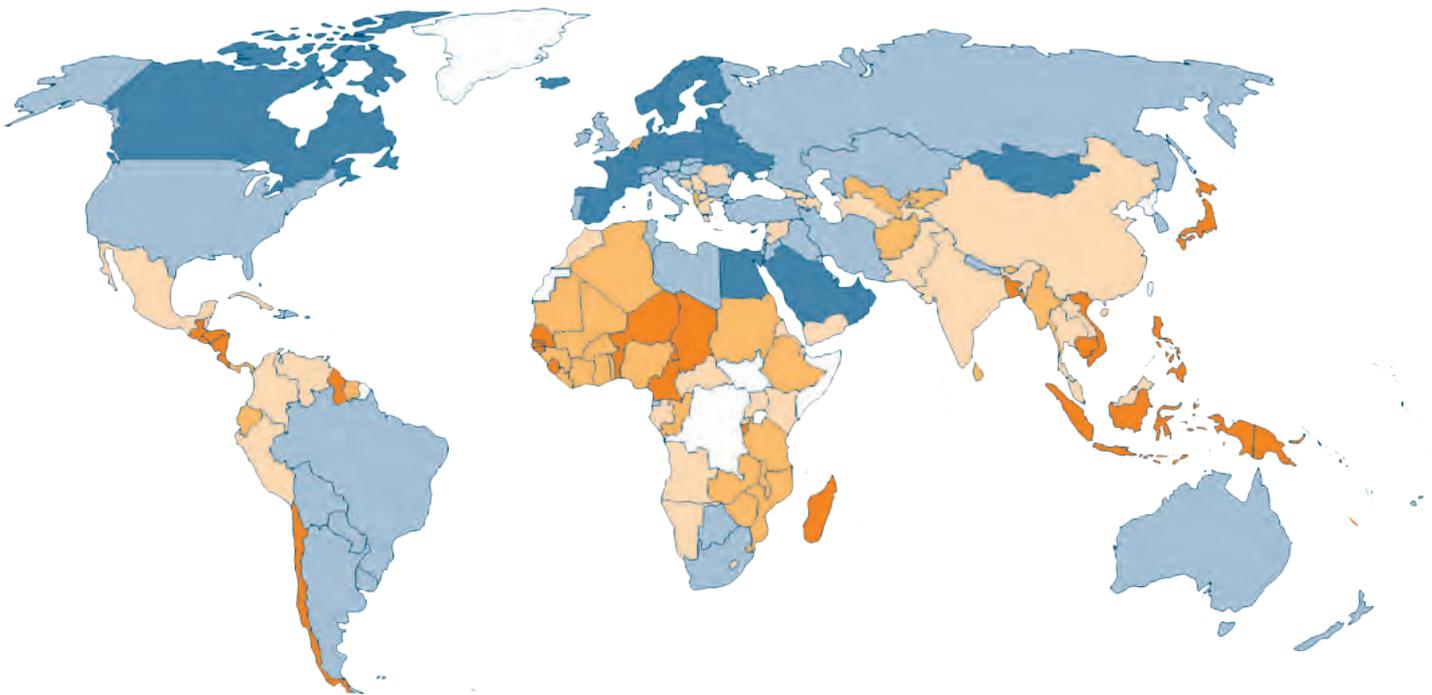
The annual climate-related losses caused by natural disasters and other events quadrupled from 1992 to 2014 to a current level of some 100 billion US dollars. This sum does not yet contain impacts that can not be measured directly in economic terms, such as the loss of human lives or of cultural assets. Developing and newly industrialising countries are particularly exposed. Climatic changes are threatening to nullify development progress.



German development has been committed actively to climate risk management for some time now. This includes conducting climate risk analyses of potential economic losses and of endangered infrastructure. Preventive measures are equally important, such as new zoning codes, early warning systems and emergency response plans.

Even the best preparations will not fully preclude damage caused by extreme weather events and the gradual changes such as increasing water scarcity or flooded coastal areas. Comprehensive climate risk management therefore encompasses emergency response: this can take the form of climate risk insurance that covers the remaining risks to the people affected, such as loss of livestock or damage to buildings.

OUR CHALLENGE: Natural disaster risks worldwide

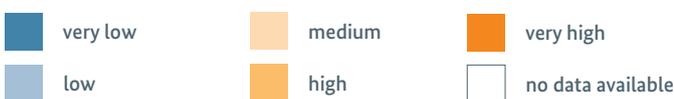


LOW COVERAGE BY CLIMATE RISK INSURANCE

Increase in storms, droughts, floods and sea-level rise

Developing countries are particularly vulnerable – damage there totals 8.1 billion US dollars annually

People’s livelihood base (mainly agriculture, fisheries, water supply) and infrastructure are at risk





InsuResilience

INSURESILIENCE – THE G7 CLIMATE RISK INSURANCE INITIATIVE

What is the initiative about?

Meeting in Elmau, Germany, in June 2015, the G7 followed a proposal by the German Federal Government to launch the InsuResilience initiative. The goal is that an additional 400 million poor, vulnerable people in developing countries gain access to insurance cover against climate risks by 2020. Implementation of InsuResilience on the ground involves close partnership between G7 states and the developing countries. When the initiative was launched, only some 100 million people in the developing world had insurance against climate-related risks. Civil society, the insurance industry and development banks are further partners.

At the subsequent climate negotiations in Paris, the G7 states pledged a rapid action package to the amount of 420 million US dollars for InsuResilience as a first step.

BMZ contributed 150 million euros to that sum. With this rapid action package, up to 180 million poor, particularly vulnerable people can gain insurance cover against climate risks via InsuResilience.

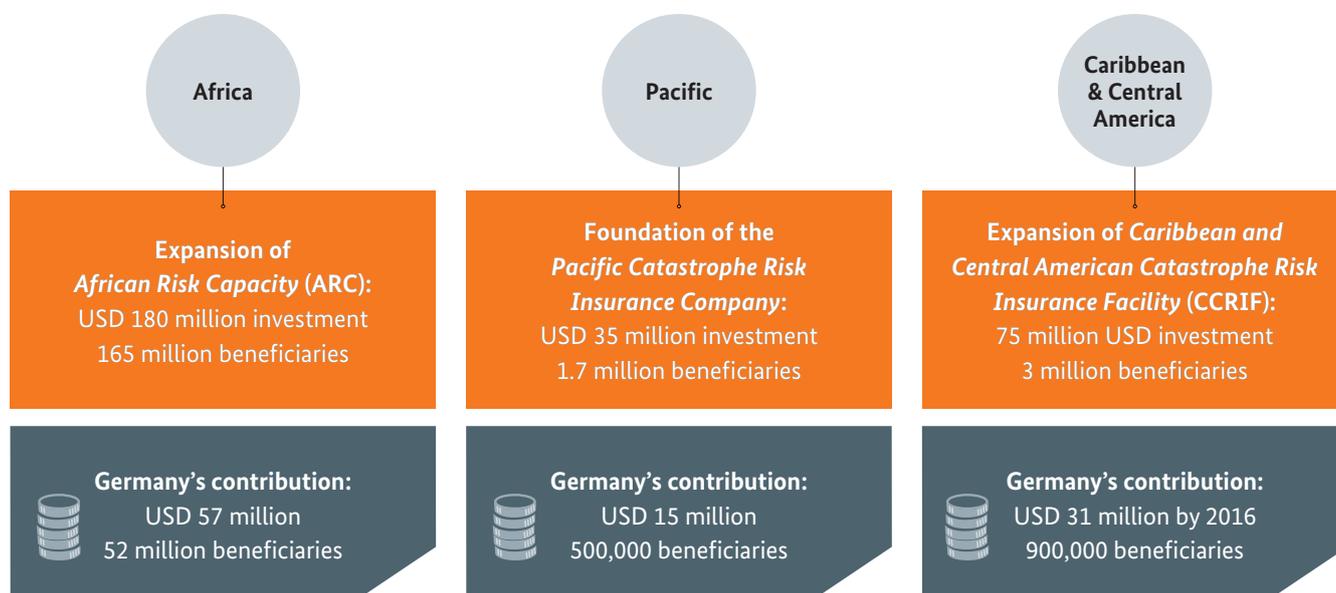
Why is a G7 climate risk insurance initiative needed?

The added value of insurance instruments stems from their capacity to buffer the adverse effects of extreme weather events: in the community of the insured, climate risks are spread across many shoulders even before potential damage occurs. In direct insurance schemes, households are insured individually against risks such as harvest loss. In indirect insurance schemes, banks or states come together in risk pools.

Climate risk insurance instruments help to close a global equity gap: in the event of damage, the people affected are no longer petitioners but claimants entitled to compensation for losses incurred. This safeguards the livelihoods of many people which are at risk from climate change.

What are the results so far?

The initiative's ambitious goal is to be achieved mainly by expanding already established indirect risk insurance facilities, together with new indirect and direct insurance schemes in vulnerable regions. InsuResilience builds upon experience and successful approaches in Africa, Latin America and the Caribbean. Furthermore, climate insurance arrangements are integrated within national or regional climate risk management strategies and are supplemented by targeted measures to develop insurance markets in the regions stated: for instance, African Risk Capacity (ARC) was founded on behalf of BMZ and the United Kingdom's Department for International Development (DFID). This is an indirect insurance facility in which African states join together in a risk pool in order to safeguard against drought. It is a special feature of ARC that each government prepares an emergency response plan in which it defines in advance how insurance payments are to be deployed in the event of disaster. If a disaster occurs, assistance to the benefit of the people affected can be provided rapidly, be it for relief action or reconstruction.



ARC has been expanded greatly with support from Insu-Resilience: to supplement the existing drought insurance, new insurance products providing cover against floods and severe storms are under development. Furthermore, ARC is gaining new member states: Mali, Malawi and Gambia joined in 2016. Further countries are negotiating their entry. The first insured event occurred in 2015, when 1.3 million people affected by drought in Niger, Mauritania and Senegal received insurance benefits such as food and animal fodder to an overall value of 26 million US dollars. This made it possible to save some 500,000 heads of livestock. Overall, ARC aims to insure some 150 million poor and vulnerable people against climate risks by 2020.

In the Pacific region, G7 members Germany, the United Kingdom, the USA and Japan have joined with the Pacific island states and the World Bank to found a new ‘Pacific Catastrophe Risk Insurance Company’ (PCRAFI). PCRAFI offers insurance products to cover tropical cyclones and earthquakes. Five island states are already policyholders: Cook Islands, Vanuatu, Tonga, Marshall Islands and Samoa. Many further countries are expected to join in the near future.

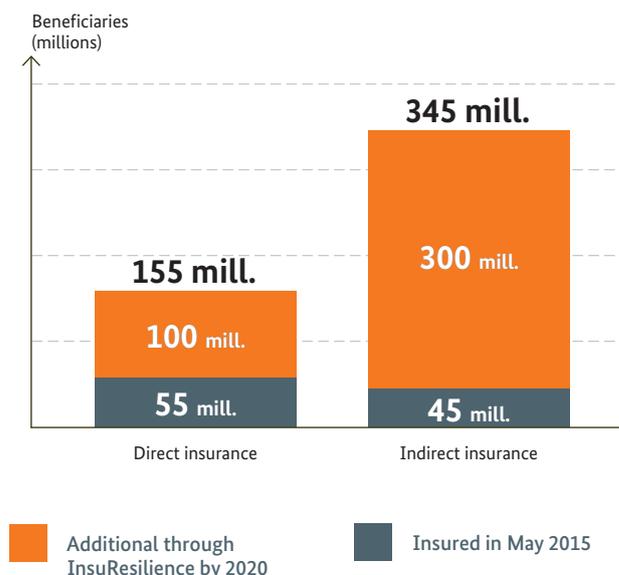
The Caribbean Catastrophe Risk Insurance Facility (CCRIF) is now being expanded to Central America. Nicaragua was the first Central American country to join, in 2016. CCRIF’s portfolio of insurance solutions is being expanded: there are now also policies covering heavy rains.



↑ Dried soil in Yangon, Myanmar.

OUR RESPONSE

To insure by 2020 an additional 400 million poor and particularly vulnerable people in developing countries against climate risks



The G7 partners are currently considering innovative climate risk insurance instruments involving new stakeholders such as humanitarian organisations, microfinance institutions, local governments and NGOs. Options to broaden the geographic scope of the initiative are also under discussion.

The InsuResilience Secretariat in Bonn became operational in August 2016. The Secretariat assists the G7 partners in all the activities that implementation of the initiative entails, such as project development, monitoring and evaluation.

Cooperation in action

DISASTER RISK MANAGEMENT IN BANGLADESH – SHELTER FROM THE STORM

Few countries are so threatened by the consequences of climate change as Bangladesh. The coastal regions are particularly vulnerable. In the first instance, they suffer as a result of gradual sea-level rise and the concomitant worsening salination of farmland. Secondly, they are hit regularly by extreme weather events such as cyclones – in 2007, for example, Cyclone Sidr destroyed the harvests, livelihoods and vital infrastructure of more than two million families.

The multilateral Pilot Programme for Climate Resilience (PPCR), which is supported by BMZ, is undertaking extensive precautionary measures to better protect coastal areas and their inhabitants from extreme weather events. Some two dozen stormproof shelters are being built or upgraded to bring them up to a standard that makes them fit for the impacts of climate change; dedicated shelters offer space for domestic animals at risk. More than 500 km of roads are being upgraded so that they are still passable when storms and floods hit. At the same time the programme is training people on the ground to plan, build and maintain infrastructure so that it can withstand changing climatic conditions and extreme weather conditions.



↑↑ This ferry on the Bhairab river, a branch of the Ganges delta, provides a link to the town of Khulna, Bangladesh.

↑ Monsoon season means flood season: in Dhaka, Bangladesh, the sewerage is completely overloaded by the strong monsoon rain.

Implementing BMZ's ten-point action plan for marine conservation and sustainable fisheries

NEW INITIATIVE TO PROTECT MANGROVES, NATURE'S 'JACK OF ALL TRADES'

Intact mangrove forests are effective in buffering storm surges and tsunami waves. A 100m deep strip of mangrove forest already suffices to dissipate 90 per cent of the force of such waves. Mangroves sequester up to four times more carbon than tropical rainforest. Furthermore, they are nutrient-rich breeding grounds for fish and other organisms, which makes them vital to biodiversity conservation worldwide and to food security in partner countries. Mangrove forests cover approximately 15 million square kilometres along tropical coasts, but logging is threatening to destroy them in many regions of the world.

In cooperation with WWF, IUCN and other internationally recognised NGOs, BMZ will promote a new mangrove conservation initiative from 2017 onwards. First the currently fragmented knowledge about mangrove conservation will be compiled. This will identify practices which have proven effective to manage mangrove forests, which will then be piloted. Studies and events will raise awareness among decision-makers in partner governments and the donor community of the importance of the many services provided by mangroves for people and nature.



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ADDRESSES OF THE BMZ OFFICES

→ BMZ Bonn

Dahlmannstraße 4

53113 Bonn

Germany

Phone +49 (0) 228 99 535 - 0

Fax +49 (0) 228 99 535 - 3500

→ BMZ Berlin im Europahaus

Stresemannstraße 94

10963 Berlin

Germany

Phone +49 (0) 30 18 535 - 0

Fax +49 (0) 30 18 535 - 2501

CONTACT INFORMATION

poststelle@bmz.bund.de

www.bmz.de



Visit us at
www.bmz.de/en