

03/2015



# Outlook Earth

Research on global change



Interview with German  
Federal Minister  
Johanna Wanka

## Climate change: Time to act

Research on global change under the sign of the Paris Climate Conference

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# Solution-oriented: German climate research

The Climate Change Conference in Paris has an ambitious goal: for the first time, a globally binding climate change mitigation agreement is to be signed. It is designed to supersede the Kyoto Protocol, which expires in 2020, but which was never ratified by many countries. The main finding of the Intergovernmental Panel on Climate Change (IPCC) makes such a decision more urgent than ever: global warming is accelerating, and its main driving force is humankind.

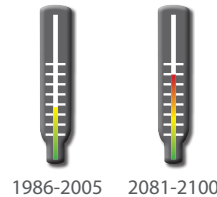
At the 21<sup>st</sup> Climate Summit (COP 21), a modern, fair and contemporary agreement will be negotiated designed to engage all countries to take climate mitigation measures. In addition to climate change mitigation, adaptation, finance, technology and capacity building will also be discussed. The negotiations are the findings of the most recent IPCC report. The results show namely that despite previous mitigation efforts global greenhouse gas emissions have continued to increase as a result of population and economic growth. At the same time, the research results show that very ambitious mitigation measures would allow us to limit global warming to less than 2°C compared to pre-industrial levels.

Climate research plays an important role in achieving these goals – not only for Germany, but also for emerging and developing countries that are particularly affected by climate change. For this reason, the German Federal Ministry of Education and Research (BMBF) promotes national and international climate research projects that are particularly strong when it comes to cooperation between scientists, decision makers and the people affected locally.

Because research serves society, climate research funded by the BMBF aims to close the most relevant knowledge gaps and to highlight possible solutions and scope for action. Research is needed wherever specific decisions on how to deal with climate change are taken.

At the COP 21 in Paris, the German Pavilion will highlight the following topics: forest, adaption/resilience, urbanisation and the German Energy Transition (*Energiewende*). In this issue, we would like to introduce some BMBF-funded research projects on these topics.

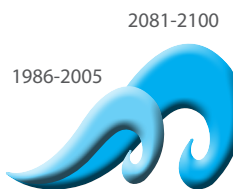
## Increase in global Ø-temperature by 2100:



# 0.3 - 4.8 °C

Source: According to IPCC, Working Group 1, 2013

## Increase in sea level by 2100:



# 26 - 82 cm

Source: According to IPCC, Working Group 1, 2013

## Key risks from climate change in Europe

Key risk	Flooding of settlement areas	Reduced water availability	Heat waves
Effects	Increased economic losses and people affected by flooding in river basins and coasts, driven by increasing urbanisation, increasing sea level, coastal erosion, and peak river discharges	Significant reduction in water availability from river abstraction and from groundwater resources combined with increased water demand (for irrigation, energy and industry etc.) and with reduced water drainage and runoff as a result of increased evaporative demand.	Increased economic losses and people affected by extreme heat events: impacts on health and well-being, labour productivity, crop production, air quality.
Climatic drivers			
Risk and potential for adaptation	<p>Timeframe Long-term (2080-2100)</p> <p>Very low      Medium      Very high</p> <p>2°C      4°C</p> <p>Temperature rise compared to pre-industrial levels</p>	<p>Very low      Medium      Very high</p> <p>2°C      4°C</p>	<p>Very low      Medium      Very high</p> <p>2°C      4°C</p>

Extreme precipitation   Sea level   Drying trend   Warming trend   Extreme temperature

Potential for additional adaptation to reduce risk

Risk level with high adaptation      Risk level with current adaptation

Level of risk and potential for adaptation

Source: According to IPCC, Working Group 2, 2014

# policy

Photo: German Government,  
Steffen Kugler



**“If the *Energiewende* in Germany is a success, other nations will benefit.”**

*Prof. Dr. Johanna Wanka  
German Federal Minister of Research*

## What do you expect from the Climate Change Conference in Paris?

We have all seen and experienced the first signs of climate change; droughts in western USA, melting glaciers in the Alps, polar ice sheets losing mass. I therefore expect all Parties to agree to a reduction of their greenhouse gas emissions. But this alone will not be enough. We also need international collaboration, when we are dealing with the impacts of climate change. In Paris we must agree upon fair commitments for climate mitigation and adaptation. The poorest countries in the world are often particularly vulnerable to the impacts of climate change and require support. For me, these are the key issues for Paris.

## How does German research policy contribute to this?

Our climate researchers are among the best worldwide. Science helps us understand the causes of climate change and, more importantly, its consequences. Our task now is to find possible solutions for the challenges we expect to arise. Specifically, how to ensure the supply of energy to industrial societies, while significantly reducing our reliance on coal, oil, and gas.

## Could you please elaborate?

For me, it is crucial that research results are communicated to the people who make decisions on how to deal with climate change. This applies to national and international climate policy, as well as to city councils, government agencies, companies and every individual citizen. Politics and society must be in a position to react quickly and flexibly to the challenges posed by climate change. We need innovations that accelerate the transition to a climate-friendly society. These are the objectives of our new framework programme “Research for Sustainable Development”.

## How does Germany assume its global responsibility?

We are funding a number of projects in which scientists from developing countries and countries in transition work together with scientists from Germany in order to develop strategies for coping with climate change. One example I would like to mention are the Science Service Centres on Climate Change and Adapted Land Management in West and Southern Africa, SASSCAL and WASCAL. Africa is particularly affected by climate change and needs robust knowledge in order to make appropriate decisions, for example with regard to land use and water management. From 2010 to 2017, we will therefore be investing up to 100 million Euros in research infrastructure and specific research

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➤ [www.fona.de/en/COP21](http://www.fona.de/en/COP21)

## Additional links

- [www.ipcc.ch](http://www.ipcc.ch)
- [www.de-ipcc.de](http://www.de-ipcc.de)
- [www.cop21paris.org](http://www.cop21paris.org)
- [www.fona.de/de/15907](http://www.fona.de/de/15907)
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projects with African partners. This will also contribute to the training of young scientists. We hope to create opportunities for young scientific talent in their home countries. The long-term funding of these projects aims to support capacity-building and knowledge generation required at the local level. Our activities in the field of sustainable urbanisation are also good examples. Up to 80% of the energy and resources used worldwide are consumed in urban areas, and more than three quarters of global emissions are generated there. For many years, our initiatives "Research for Sustainable Development of the Megacities of Tomorrow" and "Rapid Planning" have been helping to reduce emissions and to support rapidly growing cities in becoming more resilient to the impacts of climate change.

#### Germany is planning the Energy Transition (*Energiewende*). How do scientists contribute to this?

The *Energiewende* is a collaborative project, and must remain collaborative,

if it is to be a success. We will, therefore, systematically bring together research, business and civil society. To this end we developed a new project type, the "Kopernikus Projects". The Kopernikus Projects are our most important research initiatives in the *Energiewende*. The name alone highlights the fact that the task before us will require a paradigm shift. We want to establish a new form of cooperation between all partners that will make the *Energiewende* possible. Scientists have an additional responsibility in this process: They must work closely with companies and involve civil society when designing research projects from the beginning, to ensure that the population is receptive to new energy systems.

Another new aspect of these projects is their long-term orientation. The Kopernikus Projects have an overall duration of up to ten years. This will allow technical developments within these projects from the initial laboratory phase up to large-scale pilot projects. This is a unique approach.

#### What could be the international effects of a successful *Energiewende*?

Effectively addressing climate change is not the only important aspect of the *Energiewende*. In addition, supply reliability must be ensured at acceptable prices. If we succeed in this aim, then other nations will be able to benefit from this, and the *Energiewende* can become a major export success. It could become an international role model for the phase-out of fossil energy production. However, firstly, we have to do our homework in Germany and, in cooperation with our neighbouring states, turn the *Energiewende* into a success. Success stories travel fast, and a successful *German Energiewende* would trigger momentum for change in other major industrialised nations.

#### Meeting the two-degree target is becoming challenging. Do we need a more realistic mitigation target?

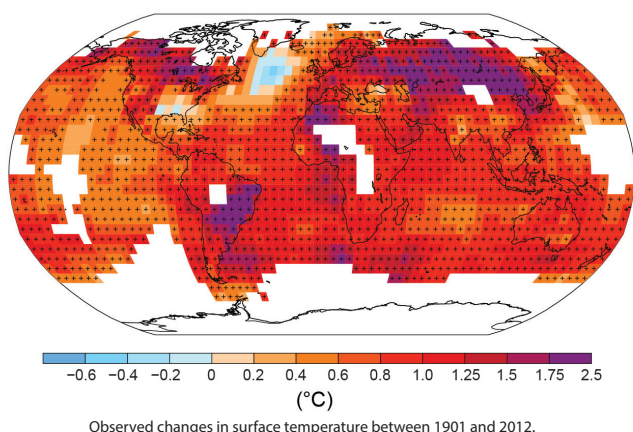
No, we do not. The message from scientists in the latest IPCC report is clear: if we act swiftly and jointly, climate change mitigation and adaptation will remain affordable and most of the impacts of climate change will probably be manageable. The question is not whether we can limit global warming to below two degrees, but how we can implement this objective. Germany is facing up to its responsibility. In Paris we have to reach out to all countries to involve them in joint mitigation action. We are investing in research, because we believe in the future! I have great confidence in the innovative capacity of our society and I believe that together, we will achieve our climate targets.



Photo: DLR-PT, Marina Rižovski-Jansen

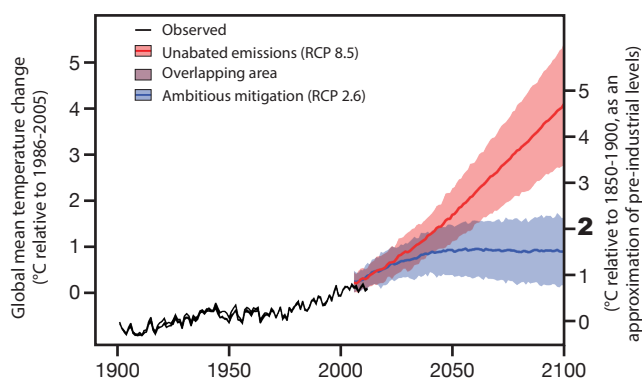
Press conference: WASCAL Council of Ministers, 2015 in Berlin

## The global mean surface temperature increased by 0.85°C between 1901 to 2012



Source: According to IPCC, Working Group 1, 2013

## Development of the global average temperature in different scenarios



## Rising risks with increasing climate change

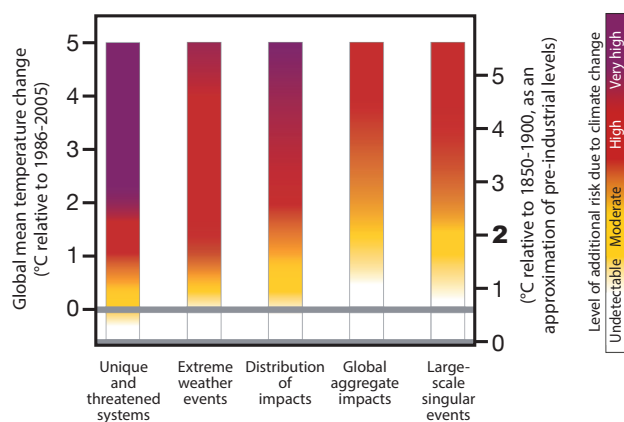


Photo: Lars Grübner, AWI

Prof. Dr. Hans-Otto Pörtner  
Alfred Wegener Institute (AWI) and Co-Chair of IPCC-WG II

Climate change appears to be a slow process; however, when viewed in terms of Earth's history, things are happening rather quickly at the moment. The decisions we are taking today determine the climate on Earth for future generations. In order to be able to take responsibility for such a long period of time, we need excellent research.

Every five to seven years, the Intergovernmental Panel on Climate Change (IPCC) issues reports that assess the scientific knowledge on climate change. Policy makers need an objective source of information about the causes of climate change, its potential impacts on the environment, society and the economy as well as about the options we have to adapt or to mitigate climate change. The reports are an essential basis for decision-making for climate conferences, and after the summit in Paris we will need more information on potential actions we can take in order to adapt to the unavoidable climate change and to slow it down at the same time.

The IPCC informs about the impacts of climate change on all continents, in all ecosystems, human societies and not least its significance for human health. In its most recent report the IPCC increasingly addressed the world's oceans; I was involved in this assessment because of my research activities as an ecophysiologist working at the AWI in Germany.

CO<sub>2</sub> is the main driver of global temperature increase, and it also dissolves in seawater thus causing ocean acidification. At the same time, the increased warming, stratification and eutrophication of the ocean cause a loss of oxygen to varying degrees depending on region. In cases where warming, acidification and oxygen depletion join forces to form a "deadly trio", marine species are particularly at risk to climate change. As the new Co-Chair of the IPCC Working Group II, my colleagues and I will take an integrated view to achieve a robust and independent assessment of the current state of research. Our work will also respond to the needs of policy-makers to implement climate change mitigation objectives in the context of sustainable development.

# “Doing research *with* Africa, not

Gabin Ananou personally attended the graduation ceremony of the second-year students in Togo this year. As the diplomas were handed out, an important success factor became apparent: “Above all, we want to educate and train local people and ultimately enable them to do research themselves”, he says. “We have come a whole lot closer to achieving this goal.” Ananou is the German contact person for the “Regional Science Service Centres in West and Southern Africa” project. It is a unique initiative in the scientific development cooperation between Africa and Germany. The maxim: Doing research with Africa, not just in Africa. Even though the entire start-up funding has been provided by the BMBF – the research projects are not dictated by Germany. Africa itself is to identify the most important topics for each country. This decision is based on the conviction

**“It is very important to me that we do research *with* Africa, and not just *in* Africa!”**



Wilfried Kraus  
Leiter der BMBF-Unterabteilung  
“Nachhaltigkeit, Klima, Energie”

that regional problems can only be solved through regional research and by returning to traditional knowledge. To this end, scientific structures are to be

created in the regions most affected by climate change. These structures will be designed to give future

local experts and politicians the chance to make their own decisions about which adaptive measures should be taken.

In July 2010 (following a one-year preparatory phase) the BMBF, together with partners from ten countries in West Africa and five countries in southern Africa, began to set up regional centres of excellence, one for climate change and one for sustainable land management, in Africa. While Africa is the continent that produces the lowest levels of harmful emissions, it is expected to suffer disproportionate consequences from rising temperatures and uncertain amounts of precipitation. To date, climate researchers have paid little attention to Africa. To make up for these major research deficits in the long term, the German Federal Government is planning to support the partner countries in the development and implementation of strategies and measures to adapt to climate change. Land use is a particularly important factor because ecosystems safeguard existential and economic livelihoods.

One research focus per country was developed in 2009; Togo, for example, focused on the topic “climate change and civil security”; Ghana focused on “land use” and Mali focused on “agriculture”. Now, five years later, all the necessary structures are in place: for the WASCAL (West African Science Service Centre on Climate Change and Adapted Land Use) project alone, which is carried out with ten West African countries, a new campus with laboratories and lecture halls was built in Ouagadougou, Burkina Faso and an administrative building was constructed in Accra, Ghana.

The research results of all participating countries are collated in the Climate Centre of Excellence in Ouagadougou. Research institutions in Germany, with whom close research cooperations exist, served as role models for the centres. In

addition, ten graduate programmes (six doctoral and four master’s programmes) were set up in West Africa. These are carried out by universities in West Africa in collaboration with the German partner universities. More than 160 young scientists

**“WASCAL provides sustainable support for young scientists.”**



Dr. Laurent Sedogo  
WASCAL Exekutivdirektor

are currently being trained, 60 of which have already completed the WASCAL graduate programme. The doctoral and master’s programmes are primarily dedicated to the impact of climate change on agriculture, biodiversity and water resources, energy supply and the economy. WASCAL is now an excellent example of the development of research capacities in Africa and of a pan-African research cooperation. “We believe this is an excellent model that could be copied around the world”, says Mahama Ayariga, Science Minister of Ghana. A search for other countries wishing to participate is currently underway.

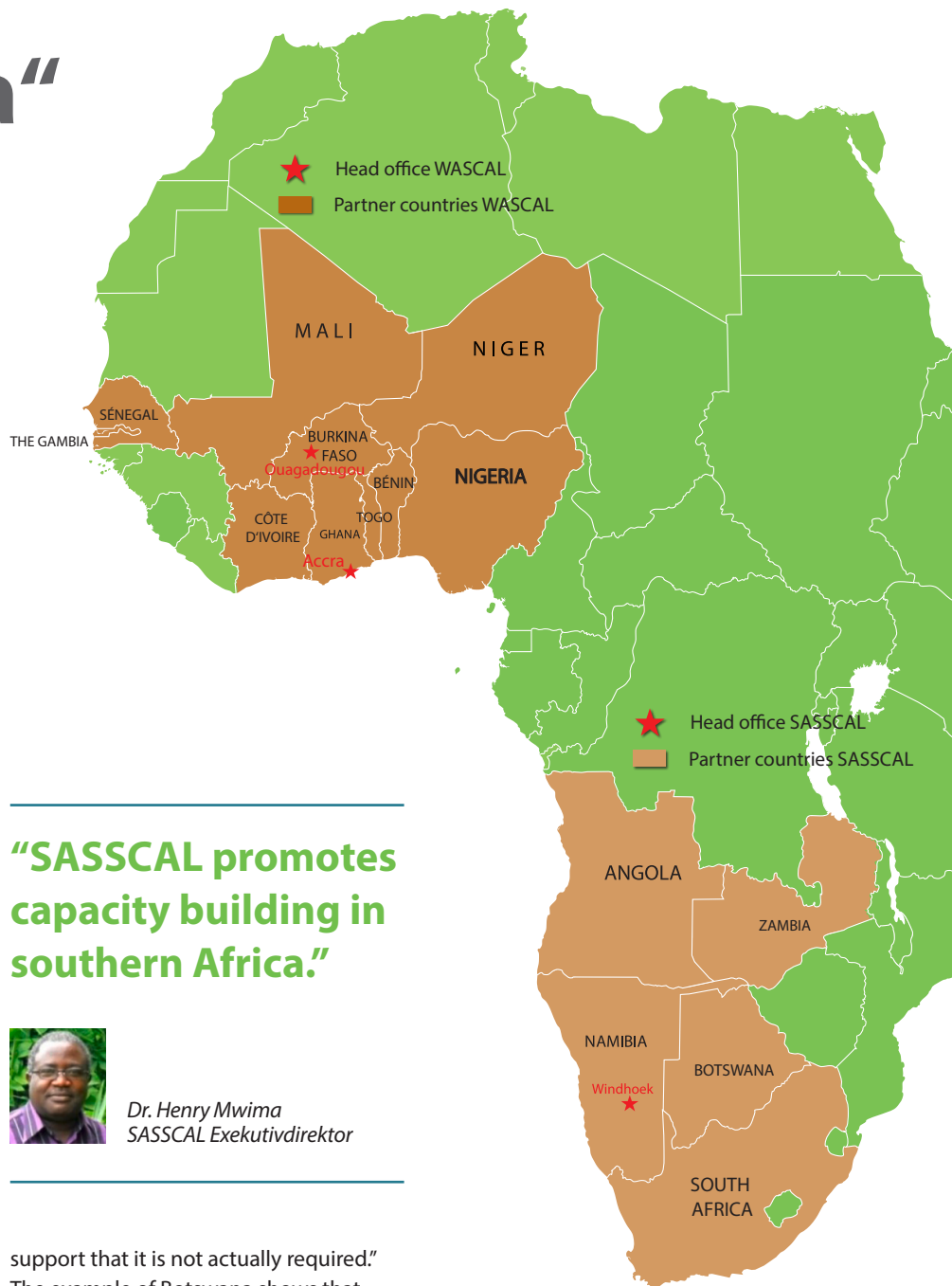
In southern Africa, the German Federal Ministry of Research is funding the second Centre of Excellence, SASSCAL (Southern African Science Service Centre for Climate Change and Adaptive Land Management), a collaboration between Germany and five partner countries: The head office is in Windhoek, Namibia and regional research, education and service



# just in Africa“

structures are being constructed in Angola, Botswana, Zambia and South Africa. This institution is also a response to the challenges of global change and stands for innovation and knowledge exchange. The centre is designed to accelerate the implementation of climate-adapted agriculture and to enable sustainable economic development under the conditions of climate change. Furthermore, the development of science and research infrastructure capacities is designed to make an important contribution on the part of Africa to international climate policy processes, for example within the Intergovernmental Panel on Climate Change (IPCC) and during international climate negotiations. As a result, there is a good chance that the voice of Africa on climate change – e.g. with regard to its damage potential – will be heard more strongly in the future. The German Federal Ministry of Research has provided WASCAL and SASSCAL with funds to the sum of 50 million Euros each for a period of five years. “We are now entering the consolidation phase”, says Ananou. Starting in 2016 the partners will take on more responsibilities, including financial ones. The funds from Germany will slowly be reduced, and the costs will be covered by the respective countries. “They either make their own contributions or they have to raise the funds elsewhere.” One possibility would be for the Economic Community of West African States (ECOWAS), West Africa’s equivalent to the EU, to get involved structurally. The project organiser DLR only provides indirect help in the search for funding: “While we do establish contact with the EU, the countries have to put in their own efforts”, says Gabin Ananou.

First, however, there will be another consultation: are the countries satisfied with the research results so far or would they prefer setting other priorities? “These priorities must be addressed in order to invest funds appropriately and avoid situations in which we provide



## “SASSCAL promotes capacity building in southern Africa.”



Dr. Henry Mwima  
SASSCAL Exekutivdirektor

support that it is not actually required.” The example of Botswana shows that sometimes significant course changes can be expected.” Experts believe there is a strong demand for research into health issues – not only on the topic of forestry, as has been the case so far. “We simply have to respect this”, says Ananou.

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[www.sasscal.org](http://www.sasscal.org)  
[www.wascal.org](http://www.wascal.org)

## ATTO: Tall Tower Observatory in the Amazon rainforest

While the Amazon rainforest is one of the most sensitive ecosystems on Earth, the “green ocean” also plays an important role in the stabilisation of the Earth’s climate. As the largest continuous forest area in the world, the Amazon stores a significant amount of CO<sub>2</sub>. Due to the evaporation of water, this vast forest also has a significant impact on the world’s water cycle. New data must be collected in order to better understand the significance of the forest for the climate and to be able to assess potential risks. To this end, German-Brazilian cooperation constructed the world’s largest observatory tower in the heart of the Amazon region.

The world’s tallest climate measurement tower is situated in a remote location, far away from human impacts. After six years of planning and construction, the 325-metre high Amazonian Tall Tower Observatory (ATTO) was inaugurated this August by representatives from Brazil and Germany.

Researchers call it a dream come true: Its height alone means that the tower is able to deliver data on greenhouse gas fluctuations and on the interactions between land surface and atmosphere that have not been collected to date. It will now be possible, according to Jürgen Kesselmeier, “to examine the transport and fluctuation of air masses through the forest over a distance of many hundred kilometres”. Jürgen Kesselmeier is a project manager at the Max Planck Institute for Chemistry, which will operate the tower jointly with the Max Planck Institute for Biochemistry, the Brazilian National Institute for Amazon Research (INPA) and the Amazon State University (UEA).

Part of the technology is still missing, but the plan is for ATTO to be fully functional by 2016. That’s when the data will start being collected and evaluated. The scientists’ initial aim is to better understand the formation and elimination of greenhouse gases like carbon dioxide, methane and nitrous oxide. So far, researchers do not know enough about the role the rainforest plays in the formation of aerosol particles and thus the formation of clouds. Kesselmeier calls it a “web of secrets” that may be unravelled. Since the measurements will be performed in higher layers of air with



*View from the ATTO over the rainforest*



*325 metres high*

a more continuous collection of data, more reliable information about the development of the atmosphere can be expected. This will permit more detailed weather forecasts and climate predictions. At the same time, this data can be used as a basis for environmental policy regulations to promote a sustainable development of the Amazon and other rainforests around the world. Details about the influence of the Amazon region on global events can now be more thoroughly analysed and ultimately even appreciated: “We want to understand the forest, in order to ultimately help and protect it”, says Jürgen Kesselmeier.

ATTO will be integrated into an existing network of smaller measurement towers run by the Max Planck Society and the Brazilian National Institute for Amazon Research. The costs for the construction of the tower and for the first five years of operation will be around 8.4 million Euro.

Germany and Brazil will co-finance the project in equal parts. The tower is planned to be in use for 30 years.



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### Links

[www.mpg.de/atto](http://www.mpg.de/atto)  
[www.fona.de/de/19809](http://www.fona.de/de/19809)

## Rapid Planning: Cities of the future

Liveable and competitive cities need functioning infrastructures. Urban populations are, however, rising so rapidly that many local administrations are unable to provide adequate systems for the provision of electricity, water, sewerage etc. Cities in emerging and developing countries are particularly affected by these challenges, as they are often already under-supplied. The research project Rapid Planning will now develop instruments that allow rapidly growing urban centres to offer potential solutions for improved management within a short period of time.

In 1950 two thirds of humankind lived in rural areas, in 2050 two thirds of the world population will be city dwellers. This rapid growth presents local administrations with great challenges. Many cities in emerging and developing countries in particular lack supply and disposal infrastructures. Climate change, rising energy needs and the increasing scarcity of resources exacerbate the problem. "This can only be overcome if people do not limit themselves to their area of competence", says Dieter Steinbach. "However, even in public administration in Germany, cross-departmental cooperation is not easy."

The geographer Steinbach is coordinator of the Rapid Planning project, which has been developing tools for trans-sectoral planning since 2014. The project is designed to give rapidly growing cities the tools they need to speedily implement sustainable and resource efficient management. "We rely on synergies that arise when you interlink the various infrastructure sectors such as water, waste, wastewater, energy and urban agriculture". What such cooperation looks like in detail will be researched in the following cities: Asyut in Egypt, Kigali in Rwanda, Da Nang in Vietnam and Frankfurt am Main in Germany. The method is to be applied in different natural and cultural environments with their corresponding dynamics and seeks to encourage regional resource management.

The focus currently lies on collecting data. The go-ahead has just been given for the fieldwork in Asyut. Waste generation data, among others, will be allocated as precisely as possible in relation to various factors: what influence do such factors



Photo: CC Tour Mana Ali

*Asyut, Egypt*



Photo: CC Bùi Thùy Đào Nguyễn

*Da Nang, Vietnam*

as district, income and lifestyle have on waste generation? "Data collection is the basis of our work, but we have already started a number of concrete projects in the local communities", says Steinbach; these projects include the enhancement of a district in Kigali, which had so far not been connected to a sewage treatment plant. "Of course everybody there wants a water toilet", Steinbach tells us. But the resources aren't available. That's why we are on the lookout for a realistic solution in cooperation with various sectors. Composting toilets, for example, are an option worth discussing. "While this is not exactly what people want, it would be an improvement." It is also important, Steinbach believes, for the local decision-makers to be pragmatic and willing to compromise. In Da Nang a riverbank management system is currently being developed. Previous investments made to prevent the risk of flooding are to be protected, i.e. new utilisation concepts are to be developed and the maintenance of the equipment is to be safeguarded in



Photo: CC Färner

*Frankfurt, Germany*



Photo: CC Paul Scott

*Kigali, Rwanda*

the long term despite a small budget. "The most important thing, however, is to enable people to cooperate beyond their own area of competence." Frankfurt is to serve as a reference city where workshops are held, and assessments are made about which of the tried-and-tested technologies and methods can be transferred. Finally, the transfer of knowledge into practice will be tested as part of the project.



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### Links

[www.fona.de/de/19980](http://www.fona.de/de/19980)  
[www.rapid-planning.net/](http://www.rapid-planning.net/)

## COMTESS: A safe future for Germany's coasts

Climate change on the North Sea and Baltic Sea coast: accelerated sea-level rise, an increased frequency of storm surges and more winter rainfall are expected. In order to develop more effective coastal protection measures that can be applied cross-nationally; the COMTESS project uses scenarios to examine the impact of climate change on conventional and innovative infrastructures. Thereby, the research group performs and assesses ecological, economic and sociological analyses.



Photo: Michael Kleyer

*Polder with sheep grazing area in Zeeland, Netherlands.*



Photo: Martin Maier

*Extensive pasturing of flood-prone coastal areas in Denmark.*



Photo: Martin Maier

*Rehydration of the "Grenztalmoor Region" in Western Pomerania.*

"Only those who live on the coast can properly understand the fear of the North Sea", says Prof. Michael Kleyer, landscape ecologist at the University of Oldenburg. People's attitudes there, he believes, are shaped by the occurrence of historic storm surges, which is one of the reasons why the population has been closely involved in the COMTESS joint research project, the coordinator continues. The initial question is, how can the land along the North and Baltic Sea coast be used sustainably while sea levels rise and the frequency and intensity of storm surges is increasing, especially since more rainfall is predicted for the winter and less for the summer. This is even more significant, because this will make inland drainage even more difficult than it currently already is. The researchers developed three scenarios, which are now being run using data from the IPCC: researchers are investigating how current utilisation, i.e.

dairy cattle farming and grassland management, can be sustained. Nowadays, the excess water is flushed into the

sea through sluices or it gets pumped out. There is no doubt, however, that the groundwater level cannot be regulated in the long term without pumping costs rising enormously. An alternative solution would be to not flush the water into the sea immediately, but rather to store it temporarily in polders. This allows fresh water to be retained that could be used during dry periods. A third possibility would be to plant reed in the polder area to encourage peat formation. These plants in turn could be used to generate bio-energy.

It was important to the scientists to make land users aware of this issue and to ask them to provide their own suggestions. "The result of this survey was a mix of the solutions that the researchers presented", says Kleyer. Now we need to determine which of these approaches is the best. To assess this, researchers use rain and temperature forecasts (which are available until 2100) to calculate which vegetation can be expected to grow on the 5000 individual plots within the assessed time period – always depending on groundwater level. In a second step, they will think about which adaptive measures

offer which opportunities to the citizens. Under the term "ecosystem service" the researchers prioritise the different returns for the population: for example food production compared to water management compared to carbon capture and storage. "Because the discussion was open from the outset, many experts in public positions could be made familiar with these problems", Kleyer explains. This is not to be underestimated, because these are the experts that play a significant role in the upcoming political decision-making processes. Furthermore, a travelling exhibition has been planned, which will continue to provide the public with comprehensive information about the changes.

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## Kopernikus Projects: Large-scale energy transition

The Federal Ministry of Education and Research's (BMBF) Kopernikus Projects constitute its largest energy transition research initiative. With social aspects in mind, new energy systems and concepts are developed to be used for large-scale technological applications. Both the project's maximum funding period of ten years and the planned funding amount of 400 million Euros reflect its prominence.

"As part of a comprehensive participation process with representatives from academia, industry and civil society, we identified key research issues for the Kopernikus Projects", Karl-Eugen Huthmacher, responsible head of department at the BMBF, emphasises. "This new research format ensures that key issues are addressed, the results find a broad acceptance in society and are successfully put into practice." The energy transition (*Energiewende*) presents Germany with major technological and social challenges. The BMBF launched the Kopernikus Projects because the reorganisation of the energy system is such a challenging task. The term stands for the energy system paradigm shift that we need. The Kopernikus Projects are part of the most important BMBF research initiative on the energy transition.

The projects are dedicated to four key issues of the energy transition:

1. The development of power grids that are adapted to a high share of renewable energies;
2. The storage of excess renewable energy through its transformation into other energy sources such as hydrogen;
3. The realignment of industrial processes towards a fluctuating energy supply;
4. And the optimisation of the interaction of various sectors of the energy system (electricity, heat, mobility) to safeguard supply reliability, economic efficiency and climate compatibility as well as social compatibility under real-life conditions.

High hopes are associated with the new funding concept: by 2025, according to



Foto: ThinkstockPhotos

*The Kopernikus Projects lay the foundations for the energy system of the future.*

the BMBF, the four Kopernikus Projects will have paved the way for a technologically advanced and economically viable energy system. It is important for society to support the results and for the expectations and needs of the citizens to be met. For this reason, representatives from civil society and social scientists have been involved in the projects from the start.

The Kopernikus Projects have an unusually long time frame of up to ten years. This is designed to ensure the close integration of research from the basics to application, and from the initial testing to the market launch. If possible, the energy transition will also be successfully exported. The BMBF will be providing up to 120 million Euro for the first funding

phase that will run until 2018. By 2025 a further 280 million Euro will be provided. The first projects are set to begin in the spring of 2016.



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### Link

[www.fona.de/de/20419](http://www.fona.de/de/20419)

## Upcoming Events

30 <sup>th</sup> Nov – 11 <sup>th</sup> Dec 2015   Paris, France	<b>UNFCCC Climate Change Conference COP 21</b>
3 <sup>th</sup> Dec 2015   Paris, France	<b>COP 21: BMBF Side Event</b> "Science-based Climate Policy: From Research to Decision Making" <i>German Pavilion, Hall 2B, Conference Centre, Le Bourget</i>
8 <sup>th</sup> Dec 2015   Paris, France	<b>COP 21: BMBF Side Event</b> "Strengthening Africa's Competence in Combating Climate Change: African-German Cooperation in Education and Research" <i>German Pavilion, Hall 2B, Conference Centre, Le Bourget</i>
9 <sup>th</sup> Dec 2015   Paris, France	<b>COP 21: Side Event of the BMBF-Funding Priority</b> "The Economics of Climate Change" <i>EU Pavilion, Hall 2B, Conference Centre, Le Bourget</i>



For more information:  
[www.fona.de/en/COP21](http://www.fona.de/en/COP21)

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Science Year 2015

City of the Future

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