

# Research: Global co-operation for locally optimised solutions

Sustainable bioeconomic production means that biomass is processed, refined and transformed directly where it grows. At the same time, one of the main objectives of the bioeconomy is to tackle global challenges. Germany's Federal Ministry of Education and Research is therefore promoting, in addition to national and European initiatives, projects in countries outside Europe that are designed, in partnership with local actors, to find locally optimised solutions.

Rural regions hold the key to structural change in the direction of a bio-based economy. On the one hand, rural regions are critically important in terms of growing sufficient biomass to supply the population with food and regenerative raw materials. On the other, the bioeconomy offers the rural regions opportunities to establish new industries, thereby creating new income and stabilising food markets. To support the vision of a sustainable bio-based economic system, Germany's Federal Ministry of Education and Research (BMBF) fosters carefully targeted research activities. To this end, it has launched a number of funding initiatives under the German government's "National Research Strategy BioEconomy 2030".

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## ■ The BMBF research strategy

Securing food supplies worldwide has top priority in a sustainable bioeconomy. To ensure that enough food will be produced in future we must not only raise agricultural output but also avoid post-harvest losses, which demands consideration of the entire value chain – from breeder to consumer. It is of paramount importance that increases in agricultural output are achieved sustainably, in other words in line with

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**Dr. Henk van Liempt**  
Head of the Bioeconomy Division  
Federal Ministry of Education and Research (BMBF)  
Berlin, Germany  
[henkvan.liempt@bmbf.bund.de](mailto:henkvan.liempt@bmbf.bund.de)

the imperatives of environmental protection, climate change mitigation, resource availability and biodiversity conservation. The sustainability aspect is of particular concern to rural areas where it is vital to safeguard natural resources.

The quantity of food is, however, only one side of the food security question. Consumers also expect quality: food that is healthy, safe and affordable. Eating habits are being shaped by shifting demographics and economic conditions, especially in developing and industrialising countries with fast-changing lifestyles and living conditions. A healthy diet assumes that healthy and safe food is produced and meets individual's expectations.

In addition to supplying the population with sufficient and healthy food, the rural areas should also be providing renewable raw materials for industrial use and for energy generation. We can make bio-based products that not only alleviate pressures on the environment, nature and the climate but also help to reduce our dependency on fossil fuels. To overcome potential conflicts between the use of plants for food and their use as a raw material for industry, the research is now, for example, looking into ways of exploiting the inedible components of plants as a source of raw materials. One solution might be what is called a multiple or cascading use of biomass (see article on pages 28–29). Again, consideration must be given here to treating natural resources like soil, water and nutrients in a sustainable manner.

A bioeconomy can only be implemented with the active participation of society and with due regard to all aspects of the industrial transformation that it entails. In the BMBF's action plan ("Wegweiser Bioökonomie") for the second half of its research strategy, the ministry has therefore drawn up four guidelines. First, we need to build greater expertise in the systemic approach to bioeconomy, one that integrates the natural, engineering and social sciences. Second, the BMBF wants to establish an open culture of communication and responsibility and foster a participatory discourse, bringing together actors from the spheres of research, industry, society and government. Third, the bioeconomy strategy needs stronger roots in industry, and to this end we are trying to create the intelligent spaces for innovation needed to develop bio-based products, methods and services. And last, but not least, thought must be given to incentives for more people to enter the field and meet the need for specialists and skilled human resources in a bio-based economy.

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## ■ Bioeconomy as a global concept

The bioeconomy is a response to the major global challenges of the 21<sup>st</sup> century – the need to feed the world's expanding population in conditions of accelerated climate change and disappearing natural resources and the need to move away from our dependency on fossil fuels. Hence, the bioeconomy can only be realised within a global context and through international co-operation.

*Co-operation with research institutions from different regions across Africa is an integral part of the GlobE research initiative.*



Photo: J. Boethling

tion. Collaboration on research and development is vital if we are to exploit the synergies that exist, especially between the industrialised world and the developing and emerging economies. These partners from both parts of the world can contribute their specific potentials, resulting in opportunities for complementing expertise and sharing know-how. This is why our bioeconomy research strategy is a national research strategy with a strong international orientation.

**GlobE – food security through sustainable agriculture in Africa.** In view of these requirements, the BMBF has initiated a research initiative entitled “GlobE – Securing the Global Food Supply”. Starting from an analysis of regional needs in Africa, “GlobE” projects identify and tackle research topics at all levels of the food production system. The integration of and co-operation with research institutions from the different regions across Africa is an essential aspect of the initiative. This collaboration allows us to determine regional requirements and address the existing challenges on the basis of a shared understanding and a needs-oriented approach. Thanks to this funding programme we are able to build bridges between developing and industrialised countries, between traditional cultivation techniques and highly developed crop systems, without displacing the knowledge and expertise of the developing countries. On the contrary, our idea is to foster reciprocal scientific exchange to the benefit of both the African and the German partners.

Global food security requires us to support efforts in the various regions

of the world to establish an efficient and sustainable agricultural system in places where food supplies are most vulnerable. This applies above all to parts of the African continent. Due to a range of factors there are rural areas in many African countries where yields are often too low for viable and sustainable farming. Some of the core issues for research conducted under this funding initiative therefore include developing appropriate cultivation methods, reducing harvest and post-harvest losses and creating greater resilience of agricultural production in the response to particular stresses.

**Bioeconomy International – research collaborations between equal partners.**

“Bioökonomie International” is a broader-based initiative. It involves close collaboration with partners from non-European countries who work with us on an equal footing. These research and development projects address central issues of the overall bioeconomy strategy. Partnerships with the South have been forged in Asian countries, such as Malaysia and Vietnam, as well as in Argentina, Chile and Brazil in South America. Each partner has special competencies, resources and infrastructures to contribute, so important cross-national synergies can be generated. To sim-

plify procedures for potential project partners, the BMBF is working closely with education and research ministries in some of the partner countries. The “Bioökonomie International” scheme can, in principle, fund projects from any fields within the BMBF’s bioeconomy research strategy, but we tend to set priorities, in agreement with individual countries, that match their specific potential and needs. For instance, co-operation with Argentina is primarily focused on the areas of sustainable agriculture and biomass production, while in the case of Brazil research into the industrial exploitation of regenerative raw materials is particularly important.

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■ **Looking to the future**

The extent to which the strategic objectives and the individual funding initiatives of the government’s research strategy will make the desired contribution to a bio-based and sustainable economy will be analysed at the end of the funding period by external evaluation. The knowledge and experience gained from the research and the wider social dialogue will provide the foundations for a future funding programme that will help secure sustainable and bio-based growth in Germany.