Climate Research: A Social Obligation of Us as Scientists

by Prof. Dr. Almut Arneth

The most important big event of the past year for the atmosphere of the earth was the UN Climate Conference at Paris, COP21. In December, heads and delegates of 195 states met to discuss the future of the earth's climate. In addition, a number of stakeholders and scientists attended. I also had the opportunity to travel to the COP21. At two information events, I presented findings obtained by environmental science in the past years with respect to the interaction of atmosphere and biosphere.

The result of the conference is known: On December 12, the states agreed on limiting global warming to less than 2°C, if possible, even to 1.5°C. This is a big success: At last, all states have acknowledged that we have to do something. At last, the will to cooperate appears to be stronger than the necessity of denying facts or blaming others. This breakthrough was celebrated rightly, and I am personally very happy that the earth's climate as we know it today and, hence, our future is given another chance.

For me as a scientist and certainly for many other citizens, however, a number of questions arise from the result of this conference. Questions regarding the feasibility of the two-degree limit, the binding force of decisions, and the verifiability of measures. Questions regarding the role of science in the implementation process. And not least, the precise question as to how we at KIT can contribute to the resulting tasks.

First, the two-degree target: Also from the scientific perspective, it is desirable. But this should not make us too euphoric. The target is extremely ambitious and its feasibility appears to be questionable at first glance. Most models assuming a limitation of global warming to 2°C also postulate the use of technologies for CO_2 removal from exhaust gases and from the atmosphere and/or geoengineering processes. These are still far away from practice or are very critically evaluated by the public.

An important element in this connection is the combination of enhanced use of bioenergy and geological storage of carbon dioxide. The hope is to reach a negative CO_2 balance in the long term. Consumption of fossil fuels will be reduced considerably. As bioenergy plants take up CO_2 from the atmosphere during growth, atmospheric CO_2 is bound in the long term, provided that the CO_2 of the plants is separated from exhaust gases during combustion and stored. Still, it may be doubted whether this is technically and economically feasible and whether the population will accept CO_2 deposits in their vicinity. And where are the areas for the cultivation of energy plants? Conflicts with food supply of a growing global population and nature protection are inevitable.

Professor Dr. Almut Arneth at the COP21 World Climate Conference in Paris. (Photo: IISD) (www.iisd.ca/climate/cop21/enbots/9dec.html)

Nevertheless, we cannot afford to be pessimistic, pessimism is not adequate. I place my hope in the many grass root actors, who take climate protection very seriously. Here, I mainly think of companies and cities. Technology-oriented companies increasingly discover the opportunities associated with a transformation of industry towards the use of regenerative energy sources. In cooperation with science, new technological options will be developed, which are not yet considered by model calculations. Cities work hard to reduce their CO_2 emission. Often, they are mentally and conceptually further ahead than national politics. Here, a lot will be achieved.

Another opportunity lies in the cooperation of science and the public. Presently, national projects to reduce greenhouse gases are of voluntary character. Even if they are implemented fully, we will not reach climate warming by 2°C, but by even 3 or 4°C. Hence, objectives have to be tightened. It is the role of science to continuously accompany the process, to collect facts, and to make them available to the public. For this, we have to communicate understandably and to go where we are heard. For example, to information events in the course of climate conferences or to advising politics and to citizens conferences. Then, I see a chance of increasing public pressure. The declarations of intent of COP21 will then produce their own momentum and force politics to act.

And also we have to act, here on the spot. At KIT, we have considerable know-how in the area of earth systems research as well as in energy research. If we bring this together and link it with the relevant social and economic sciences, then KIT may position itself as a heavyweight in climate change and climate change assessment research. We have the potential to do so, and the social obligation.