

Conclusion of the results of the presentations and discussions of session 2: Science for Sustainability: Challenges

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Careful, continuous, cautious, and a consistency between growth, use and output - with these key terms the mining engineer Hans Carl von Carlowitz described in his famous path breaking book in 1713 the future challenges of a sustainable forestry providing wood and environmental goods to the region of Southern Saxony in Germany. With this holistic, integrated view and a main focus of production itself, but also on efficient energy consumption, innovative, ecology sound and economically viable technologies, and last but not least searching for alternatives in resources and energy he formulated the theoretical basis for a long-term strategy. Nowadays internationally accepted and a key principle in human acting and economic activities the integrative focus on the three key pillars of sustainability - the economy, the ecology and socio-cultural fundamentals – gives us consistent orientation along through the current challenges both in economy and science.

During the opening ceremony of the first conference “Science for Sustainability – the potential for German-Brazilian cooperation on sustainability” both the German Minister for Education and Research Schavan and Minister for Science and Technology Rezende – stressed the importance and future challenges to cooperate stronger in the fields of water, resources, and climate change. And, during his introductory speech, Mr. Zickler further accentuated to strengthen the technology transfer including education and advanced training.

Disciplines and thematic topics involved during the statements and presentations within the session covered ecological and environmental services incl. C sequestration, land use, biotechnology, ocean bed dynamics with special focus on gas hydrates and methane and environmental economy. To consider, to assess and especially quantify ecological and environmental services clear and accepted conceptual models have to be developed in interactive panels with a strong contribution of local, regional or national stakeholders (contr. S. Chapman). Still increasing pressure on land use intensity and on natural ecosystems like forest or natural grasslands challenge science to find out ways to conciliate sustainable use of natural resources with well-being of local population, by reducing rural and urban poverty and by overcoming the conflicts between the demand for land and territorial occupation model differentiated to scales and functions of the different landscapes and regions involved (contr. N.E. Santos Beltrao). Within the framework of production and conversion of food, fiber and raw material, a stronger contribution from biotechnological disciplines is necessary (contr. C.E. Young). In terms of alternative energy resources not only terrestrial potentials with their strong competition interactions, but also marine resources have to be considered to solve the great energy demand in the future. Marine gas hydrates offer a chance to gain access for new gas reservoirs and CO₂ storage sites (contr. J. Bialas).

Beside the natural and technological potentials the socio-economic background and drivers need high attention as integrative part of ecological and technological research from the very early beginning on. Research for sustainability needs to be tackled in a framework on an integrated and systemic approach for understanding conflicts, to provide concepts for optimal and or rational solutions of resource conflicts, and has to consider a sound design of appropriate governance and incentive structures in order to ensure that societal developments perform in a sustainable way (contr. E. Gawel). And finally, strong emphasis

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has to be given to an efficient technology transfer including education and advanced training. Especially for the latter, modern, efficient and attractive methodologies considering the decreasing half-life period of knowledge and to reach diverse target groups are of crucial.

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