

# Reed as a Renewable Resource and Other Aspects of Paludiculture

## FOREWORD

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With the global increase in population and demand for food resources on the one hand and the increasing utilisation of biomass for bio-energy production on the other, the demand for productive land areas is growing. In many regions of the world, vast areas of wetlands exist that are available for production of biomass for energy and raw material without competing with food production. Harvesting of wetland biomass is easily aligned with other demands like climate protection, water and nutrient regulation, nature conservation and recreation. The production of pulp and paper, building materials (walls, roofs, insulation) and energy (biogas, combustion) from common reed (*Phragmites australis*), sedges (*Carex* spp.) and reed canary grass (*Phalaris arundinacea*) has already established a promising opportunity to tap into wetland biomass as a new and sustainable biomass resource.

The first international conference on the utilisation of emergent wetland plants “Reed as a Renewable Resource” (RRR) in Greifswald, Germany (14–16 February 2013) brought together around 160 experts from all over the world to exchange visions, experiences, ideas and information, to identify research demands and to build networks. In the midst of peatland-rich Western-Pomerania, attendees represented research, governance and implementation from the Baltic States to Bangladesh and from Canada to China. The promising potential of reed biomass as a renewable raw material and fuel created a “pioneering spirit” that pervaded the event and the following field excursions. More than 50 oral presentations, 25 posters and various demonstrations covered multiple aspects of the utilisation of reed biomass including ecosystem services, harvesting techniques and logistics, biomass processing and product development as well as legal and economic frameworks. An open-air exhibition of large machinery for harvesting and processing wetland biomass in the Greifswald market square brought “Reed as a Renewable Resource” to the attention of the public. The conference made it clear that we collectively have much more knowledge and experience of the utilisation of wetland plants than

was previously realised within individual countries.

The use of wetland biomass still faces several challenges for the near future. Markets are only partly developed and wetland products need stronger promotion. Also, production and commodity chains must be expanded, and technical equipment for large-scale harvesting and processing requires further optimisation. Moreover, policies and regulations will need to be put in place to satisfy the many demands placed on wetland ecosystems, including the diverse ecosystem services and values that wetlands offer alongside production of biomass. Regulating services like climate protection, nutrient retention and groundwater supply, as well as biodiversity and recreation values, should ideally be remunerated by society. The synergistic positive effects of peatland re-wetting, wet land use and cultivation of wetland biomass should be promoted to stakeholders in government, agriculture, industry and nature conservation alike. Particularly, the co-operation between (wetland) agriculture and nature conservation would need to be intensified to ensure that this aspect receives the attention it deserves. Paving a new path to sustainable and profitable use of wetland biomass furthermore requires the adoption of favourable legal conditions. Biomass cultivation on wetlands must be included in agricultural subsidy schemes, and existing regulations placed on paludiculture (land use of re-wetted peatlands) need more flexibility.

Much has already been achieved at international level. The Ramsar Convention on Wetlands mentions paludiculture as a sustainable option for the production of biofuels (Resolution X.25). With the start of the second commitment period of its Kyoto Protocol, the United Nations Framework Convention on Climate Change (UNFCCC) enables parties to account for greenhouse gas removals arising from re-wetting (Decision 2/CMP.7). To that end, the Intergovernmental Panel on Climate Change (IPCC) has produced new guidelines on National GHG Inventories as well as on reporting of emissions and removals under the Kyoto Protocol. Paludiculture is explicitly mentioned in these guidelines as a land use option for re-wetted areas. Also the UN Food and Agricultural Organisation

(FAO) has acknowledged paludiculture as a sustainable activity to ensure the availability of productive land that would otherwise become useless because of ongoing subsidence and degradation. These global initiatives need to be adopted by national schemes and implemented at regional level to endorse wet agriculture as a cost-effective means to meet the manifold challenges of sustainable land use.

We hope the conference and this Special Volume of *Mires and Peat* will help establish a wise use of wetlands that takes into account the multi-faceted values society places on these ecosystems. While the book of abstracts is available at <http://www.rrr2013.de>, the papers in this special issue provide more depth and detail on some central issues of the utilisation of wetland biomass. Besides a general review of the historical use and potential of common reed (Köbbing), the volume includes articles on novel uses of reed as a building and insulation material (Georgiev *et al.*, Miljan *et al.*) and on the use of reed biomass as fuel (Kask *et al.*, Link *et al.*, Wichtmann *et al.*). Addressing the climate regulation function of re-wetted peatlands, Huth *et al.* provide insights about methane emissions from various reed stands on a re-wetted peatland. Establishment and utilisation of reed is certainly not always the best available option for aligning the various demands of society on wetlands. Focusing on their biodiversity conservation values, Sweers *et al.* show how water buffalo can be effective in suppressing the encroachment of common reed on salt marshes, Dubowski *et al.* summarise new developments in the design of agricultural machinery that aim to reduce the impact of vegetation management on protected wetlands, and Vaičekonytė *et al.* propose the use of thinnings from existing reedbeds in mixed biofuels as a ‘win-win’ solution for wetland biodiversity in North America. Recognising that reed lands provide a range of ecosystem services, Croon considers how they might be saved from reclamation by promoting commercial uses for sustainably harvested reed, whilst Gaudig *et al.* exclude reeds altogether and present long-term project experience on the establishment of *Sphagnum* as a renewable resource for horticulture.

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