



United Nations  
Educational, Scientific and  
Cultural Organization

Organisation  
des Nations Unies  
pour l'éducation,  
la science et la culture

Organización  
de las Naciones Unidas  
para la Educación,  
la Ciencia y la Cultura

Организация  
Объединенных Наций по  
вопросам образования,  
науки и культуры

منظمة الأمم المتحدة  
للتربية والعلم والثقافة

联合国教育、  
科学及文化组织

# Floodplain Declaration



# **Declaration on Sustainable Floodplain Management - change of perspective**

*Based on the presentations and discussions at the International Conference on Ecohydrological Processes and Sustainable Floodplain Management: Opportunities and Concepts for Water Hazard Mitigation, and Ecological and Socioeconomic Sustainability in the Face of Global Changes*

*Organized at European Regional Centre for Ecohydrology under the auspices of UNESCO - Int. Inst. Polish Academy of Sciences, 19-23 May 2008, Lodz, Poland.*

## **Introduction:**

In the face of dramatic acceleration of global environmental degradation, and a progressive shortage of water and energy, there is increasing scientific evidence that the Biogeosphere is a self-stabilizing system controlled by feedback mechanisms between climate, water, and biota that has developed during the Earth's evolution. We are now in the Anthropocene period during which 80 % of the Earth's surface has been impacted by human activities. Consequently, the natural homeostatic regulation of hydrological and biogeochemical processes has been dramatically reduced, resulting in a decline in biodiversity and ecosystem services. River valleys and floodplains typically occupy lower elevations in the landscape and thus are highly exposed to cumulative human impacts from the surrounding catchment, yet are also havens for aquatic and terrestrial biodiversity and therefore should be specially protected, restored and managed.

## **Recognition: Properties and values of floodplains**

Floodplains are dynamic wetlands, an integral part of river basins with a high potential for biological productivity, biodiversity, flood mitigation, groundwater recharge, river purification and regulation of exchanges of nutrients between land and water, and other ecosystem services, all maintained by the pulse-regulated hydrology of running waters.

Floodplains are threatened by increasing population and improper management. Development of floodplains without consideration of the specifics of their ecological structure and dynamics thus diminishes biodiversity, reduces benefits to society related to water quality, cultural aesthetic values and – in consequence – causes economic losses.

## **Floodplains and global climate change**

Floodplains are an important component of global environmental security and resilience because of their high compensatory potential to mitigate environmental change due to their capacity for water retention, food production, CO<sub>2</sub> sequestration, production of bio-fuels, and the diversity of habitats that they support.

## **Integrative science for problem solving**

Understanding the functioning of floodplains and their potential for socio-economic benefits, requires integration of recent knowledge of:

- geomorphological and paleohydrological evolution of river valleys,
- hydrological processes and patterns of ecological succession,
- societal interactions and learning alliances,
- climate scenarios,
- strategic forecasts based on integrative modelling and adaptive management

In order to reverse floodplain degradation and increase ecological resilience and economic benefits, a shift in strategy from floodplain exploitation to floodplain sustainable use is necessary. Accordingly we need a change of public perception from sectoral, structural and reactive responses to an integrated, process-regulation-oriented and proactive approach.

## **Methodology for provisioning sustainable ecological services of floodplains**

- Ecohydrological management of floodplains, will require “dual regulation” - a framework for harmonisation of biodiversity conservation with such human needs as flood mitigation, food and energy production, transport and recreation.
- Hydrotechnical infrastructure harmonised on the basis of integrative science and best management practices incorporating catchment scale ecosystem processes, will be a powerful tool for reversing degradation of biodiversity, and enhancing sustainable development and compensation of global changes
- Cultural heritage of the catchment should become an important element for spatial reconnection of floodplains to the adjacent landscape, as well as restoration of links to social, economic and cultural values.
- People’s perception and attitudes to the changing environment can only be shaped by new solutions based on integrative science which depend upon development of programs and methodologies for education and communication.

## **Tools for implementation**

- Policies by national and international institutions for water resources, energy, transportation, and environmental management must elevate the protection of pristine sections of the floodplains and promote sustainable use, and restoration of degraded floodplains on rivers, lakes and coastal zones.
- Land use integrated planning, financial incentives, economic instruments, and environmental regulatory frameworks are essential tools for implementing the ecohydrological standards and criteria. In case of “novel floodplains”, created by secondary succession after human impact, floodplain loss due to essential new development of e.g. transport systems should be mitigated through restoration of at least twice the area of degraded floodplain.
- A network of long-term ecological processes, research sites, responsible institutions, and data bases is needed for improving progress and transfer of knowledge, and transfer and sharing of technology.
- Public participation, facilitated by modern communication approaches, is fundamental to accommodating conflicting interests and uses of floodplains.

## **Recommendations for action plan:**

- Classification of different types of floodplains with special consideration of catchment perspective and ecosystem services;
- Development of methodology to assess rate and type of flood pulses necessary to maintain floodplain functions and structures and to reconcile protection and social needs;
- Formulation of principles for floodplain management, sustainable food and renewable energy production based on integrative science and the relevant science/policy interface.

## **Conclusion:**

The successful reversal of degradation of floodplain ecosystems should become the focus for development of a sound vision of the co-evolution of Ecosphere and Anthroposphere, by engineering harmony between three dynamic and evolving components: catchments, water resources and society, with an emphasis on change from exploitative to participatory environmental consciousness.

Fundamental to this is the continuing integration of highly specialized disciplines of environmental and social sciences into the framework of Ecohydrology - a holistic problem-solving concept.

The implementation of such trans-disciplinary sustainability science, whose important new components are: system approach, foresight methodology and learning alliances, should expand catchment and freshwater resources, ecological and socioeconomic aspects of catchment potential, and improve human health and the quality of life following the UN MDGs.