



Panta Rhei – Everything Flows
Change in Hydrology and Society
IAHS Scientific Decade 2013-2022
www.iahs.info/pantarhei

Details of the Proposal

Title of the Research Theme

Large-scale Water Projects and Society

Abstract of the research theme

The last century has witnessed the construction of numerous large-scale water projects (e.g. dams) to meet our growing water demands. Although their benefits for our survival and socio-economic development are undeniable, there are also increasing concerns about their negative impacts on our environment and socio-economic fabric of affected people. These have led to serious debates on the role and future of such projects, and there remain questions at fundamental levels, including: (1) Can our societies be sustained without the construction of new large-scale water projects, in the face of projected population growth and worsening hydrologic extremes under climate change? (2) What would be the impacts of existing and new projects on our hydrologic, environmental, and socio-economic systems? and (3) What are the major challenges in undertaking investigations and implementing measures to prevent/mitigate damages due to such projects and how to overcome them? The proposed Research Theme will address these questions.

Panta Rhei research Targets and Science Questions addressed by the Research Theme

Targets:

Target 1 - Understanding

Target 2 – Estimation and prediction

Target 3 – Science in practice

Science Questions:

Science question 2: How do changes in hydrological systems interact with and feedback on natural and social systems driven by hydrological processes?

Science question 3: What are the boundaries of coupled hydrological and societal systems? What are the external drivers and internal system properties of change? How can boundary conditions be defined for the future?

Science question 4: How can we use improved knowledge of coupled hydrological-social systems to improve model predictions, including estimation of prediction uncertainty and assessment of predictability?

Science question 6: How can we support societies to adapt to changing conditions by considering the uncertainties and feedbacks between natural and human-induced hydrologic changes?

Societal impact of the Research Theme

Large-scale water projects play a key role in meeting various water demands around the world: for example, dams supply water for 30–40% of the total irrigated land and generate 20% of the total electricity. However, such projects also cause serious environmental and social problems: for instance, dams have severely fragmented 60% of the world's 230 largest rivers and displaced 40–80 million people. There is already significant controversy about the role and sustainability of large-scale water projects in our societies, and this situation will likely get only worse in the future. This Research Theme will approach this controversy in a balanced manner, through addressing the fundamental hydrologic, environmental, and socio-economic issues related to large-scale water projects. The outcomes will provide important guidelines for large-scale water projects and will greatly advance planning, management, and policy on water and environment as well as socio-economic development, especially in developing and least-developed countries.

Panta Rhei Working Groups referring to the Research Theme

I am proposing a Working Group to address the proposed Research Theme.

Title of the Working Group: Large Dams, Society, and Environment