

MARS fact sheet #11

Storylines: writing the future for effective water management – Consensus World

The future is uncertain. Depending on both human actions and the scale of climatic changes, we can expect any number of potential changes in freshwater ecosystems between now and 2060. In response to this uncertainty, MARS scientists and stakeholders have collaboratively developed a range of different scenarios, each based on climate and socioeconomic predictions.

Using these scenarios, three ‘storylines’ were written to explore the potential future impacts of multiple stressors on the ecosystems and basin regions studied by MARS. Two time horizons are used for scenarios: 2030 (to inform the update of the Water Framework Directive in 2027) and 2060 (to show the impacts of climate change).

This scenario methodology has been used by many organisations to present unpredictable futures, including UNEP and the IPCC. Traditionally, these scenarios have been simple, linear predictions, with sequential and predictable relationships between socio-economic actions and climatic and environmental outcomes.

In recent years, however, scientists have pointed out that the interactions between humans and the environment are more complex than such a sequential approach gives credit for, and a more responsive methodology is used here, in which emissions and socio-economic scenarios are developed in parallel.



Wind energy at a lake (photo: Conor Dupre-Neary, Flickr.com, CC licence)

Analytical priority is given to changes in emissions and greenhouse gas concentrations over time (termed ‘Representative Concentration Pathways’). Scenarios can then be created based on these emission pathways alongside parallel (and plausible) ‘Socio-Economic Pathways’ and policy scenarios.

Scenarios and water management

As water management is usually site-specific, global data and predictions currently tells us little about water management in the future. Projections and data do tell us, however, about aggregate global demand and availability.

The storylines designed by MARS scientists use this data and create further predictions around potential changes such as technologies for irrigation, changes in river discharges, changes in pesticide use (and thus pollution), technologies like dikes and dams, water use in industry and energy production, and use of surface and groundwater.

Consensus World

The Consensus World storyline is based on a scenario where future development follows similar patterns to the recent past: the economy grows well in some countries and poorly in others, and inequality between rich and poor countries continues.

Despite this disparity, the world tends towards being relatively politically stable (Shared Socio-Economic Pathway 2).

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This occurs alongside a stabilising and relatively low level of climatic change (Representative Concentration Pathway 4.5).

The Consensus World storyline features a future world with the following features:

Economy

In the Consensus World, the global economy and world population are growing at a rate similar to today. Governments worldwide aim to achieve both economic growth and sustainable and efficient use of resources. Investments tend to be low-risk, and technology improves over time, but without any fundamental breakthroughs. While the economies of some countries grow, others perform poorly and global poverty is not eradicated.

Energy

Energy is produced using a mixture of renewable and fossil fuel sources in the Consensus World. Between now and 2030, fossil fuel dependence decreases slowly, but this does not impact on the growth of renewables. The use of bio-energy crops increases significantly. The reproduction rate levels off in the second half of the century, so pressures on energy resources are not increased too significantly by population growth. Regulations are in place to save energy and reduce emissions.

Environment

In Consensus World, there is public and political interest in environmental conservation. This is largely in line with existing regulations, though these have been extended and strengthened over time. Greening measures that are currently being proposed within the EU are being implemented.

As now, global and national institutions are making some progress towards sustainable development goals, but this progress is slow. The environment continues to be degraded over time, but there are some improvements.

Resource and energy use declines. Continued poverty in some countries and areas means that many people are left vulnerable to environmental change.

Policies

Current European environmental policies (such as the EU strategy on Adaptation to Climate Change, the EU Biodiversity Strategy, the Habitats and Birds Directives, the Directive on Industrial Emissions, the Regulation on European Pollutants, Floods Directive, Directive on Environmental Quality Standards and Dangerous Substances and the Water Framework Directive) are continued beyond 2020 in an improved and more integrated manner. The objectives and targets are well designed and their achievement is realistic.

Water Management Strategies

European water management strategies are designed in line with the continuing suite of strong regulations. Moderate economic growth means that cheap solutions that are sustainable over the moderate to long-term are the preferred choice, but there is a trend towards solutions that are more sensitive to ecosystem health, and green environmental solutions that work sympathetically with natural processes and functions.

Links

Shared Socio-Economic Pathways:

<http://tinyurl.com/jcuhq4h>

Representative Concentration Pathways:

<http://tinyurl.com/hrnlx9s>