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Editorial

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At a time when food security and competition between land for food and land for biofuels is in the public eye, and legislation is placing ever increasing demands on the way we manage the environment, it is pertinent to consider the effect on our water resources and the way we manage them. The UN *Millennium Ecosystem Assessment*[1] predicted that by 2050 we would need to

(*a*) increase food production by more than 50% as the global population increases by 50% to 9 billion
(*b*) secure additional fresh-water resources to meet a 30% to 60% increase in demand, mainly linked to higher agricultural demand
(*c*) do these things within the context of climate change, the effects of which appear ever more likely to be both chaotic and underestimated
(*d*) maintain the underpinning biodiversity and ecosystem functioning on which all else relies.

The *Millennium Ecosystem Assessment* further identified water supply and water quality amongst the ecosystem services under greatest pressure globally. Many governments are now moving towards an ecosystems approach to environmental management,[2] requiring us to look at the impacts of any actions on a wide range of environmental functions. Thus, for example, land use or management change may have an impact on food production, water resource, water quality, flooding, biodiversity and soil processes, amongst others, and needs to be considered in light of all of these. There will always be trade offs that have to be made, but there is a need to provide scientifically robust information to decision makers.

There are many challenges for climate scientists, hydrologists and water engineers if we are to provide such information to governments. Prime amongst these are

(*a*) the use of information from global climate models in regional or catchment-scale impact assessments
(*b*) the development, testing and demonstration of robust integrated catchment models that allow us to assess the impacts of proposed changes, such as those being developed under the Water Framework Directive *Programme of Measures*
(*c*) the more efficient and effective use of water in irrigation to maximise food production whilst minimising unwanted side-effects such as salinisation of soils
(*d*) the development of effective monitoring strategies to improve process understanding, to increase confidence in the predicted outcomes of management change and to allow effective monitoring of change.

REFERENCES

1. See http://www.millenniumassessment.org/en/index.aspx (last accessed April 2008).
2. See for example http://www.defra.gov.uk/wildlife-countryside/natres/eco-actionp.htm (last accessed April 2008).