



Northern Territory's Daly River flows year-round and in the dry season provides a critical environmental flow for the region, which would need to be maintained in any plans to use it as an irrigation source. CSIRO

Sustaining our iconic north

At first glance the flooding rains of Australia's north may look appealing to water-hungry populations in the south. But take a closer look at water in the north in the context of the complex and fragile iconic landscapes it supports, and another picture emerges.

Long dry seasons and limited opportunities for storing large volumes of water in northern Australia provide additional challenges to those seeking to expand existing industries or establish new ones in a long-term, sustainable manner.

To enhance future decisions about changing the use of Australia's northern land and water resources, national, state and territory authorities need a better understanding of river and catchment attributes and the risks and benefits associated with irrigation.

A collaborative research project involving scientists from CSIRO and the Cooperative Research Centre for Irrigation Futures is focused on surface water and groundwater systems in Australia's north and their potential to support various forms of irrigation.

The Northern Australia Irrigation Futures (NAIF) research project also involves the Australian, Queensland, Northern Territory and Western Australian

Governments, Land and Water Australia and the National Program for Sustainable Irrigation.

Project leader Dr Keith Bristow says the four-year project has identified an historic opportunity to ensure that management and use of Australia's northern land and water resources takes place within a strategic, ecologically, culturally and economically sustainable framework.

'Unique landscapes, catchments and water systems, as well as highly variable tropical weather patterns have helped create complex and diverse ecosystems in Australia's north,' Dr Bristow says.

'These often-fragile ecosystems require special attention to ensure their integrity is retained if any changes are made to the system.

'With 60–70 per cent of Australia's water runoff discharging from our tropical rivers, there is pressure to extract some of the water for irrigated agriculture and other purposes.

'The aim of this research is to provide new knowledge, tools and processes to support debate and decision making regarding irrigation in northern Australia.'

The project included developing case studies in the lower Burdekin catchment in north Queensland, the Ord catchment

in WA, and the Katherine-Douglas-Daly catchment in the Northern Territory. These case studies allowed the testing of ideas and frameworks, with researchers gaining feedback directly from local communities to help ensure the ideas being developed were practical and likely to be adopted.

The project also investigated the potential for irrigation mosaics, smaller patches of irrigation distributed across the landscape, as an alternative irrigation approach to deliver diversity to existing enterprises and improve social and economic opportunities for rural and remote largely indigenous communities in northern Australia.

NAIF researchers developed computer simulation models to help assess the potential biophysical impacts of various irrigation mosaic arrangements.

But more research is needed to better understand the longer-term ecological, social, economic and biophysical advantages and disadvantages of irrigation.

Dr Bristow says it is not the scientists' role to make decisions about current or potential irrigation in northern Australia.

'These decisions are the responsibility of the relevant governments and communities,' he says.

'Our work aims to support that decision-making, and to help ensure that any development of Australia's northern land and water resources takes place within an ecologically sustainable development framework.'

The project has highlighted the importance of developing a system-wide understanding of irrigation in northern Australia and a shared vision for its future.

'Irrigation must be preceded by catchment-scale water, salt and nutrient management plans to deliver long-term ecologically-sustainable development,' adds Dr Bristow.

'Generating localised short-term benefits from irrigation is relatively easy, but delivering catchment-scale long-term sustainability is the real challenge.'

The work has also demonstrated that while no single framework can hope to ensure sustainability, it is possible to deliver knowledge, tools and processes that can help governments and catchment communities charged with making decisions about these complex issues.

● **Helen Beringen**

More information:
Northern Australia Irrigation Futures,
www.clw.csiro.au/naif/