

Building knowledge and capacity to support integrated water resource management in Pakistan

The Australian government through its Sustainable Development Investment Portfolio (SDIP) is helping Pakistan to build modern water management and assessment tools for the Indus Basin. Impacts on water, food and energy security from future climate, population increase, and infrastructure development on water resource availability are considered. Water availability predictions are provided for the coming cropping season. These predictions are used as part of modelling storage operations, river flow, water sharing and irrigation delivery. The modelling framework considers the interaction between river and groundwater resources. The implementation of Australian water management technologies and associated capacity building is supporting a productive and water secure Pakistan.

Background

Pakistan is totally reliant on the surface and groundwater resources of the Indus Basin to support food, energy and economic security. Pakistan faces some significant challenges with very low per capita water availability and a rapidly growing population. The challenges are exacerbated by unsustainable use of groundwater, changes in the seasonality and amounts of rainfall, and limited storage (30 days of use). On this basis the Indus is one of the most vulnerable river basins in Asia.

Pakistan and Australia have a long history of working together and the similarities between the Indus and the Murray-Darling Basin provide a foundation for a water partnership. Building on this foundation, the Australian Government is helping Pakistan implement Australian water resource management technologies, and building local capacity in integrated water resource management and impact assessment. The project is led by CSIRO as part of a 12 year program funded by the Australian Department of Foreign Affairs and Trade.



Pakistan's reliance on the Indus as seen from space: Pakistan's irrigation system is sustained by the river and groundwater resources of the Indus Basin

A new generation of water management tools provides a defensible and agreed understanding of the water resources of Pakistan. They provide a means of assessing the impacts and trade-offs of external drivers and management interventions on the nation, provinces and the broader water dependent community.



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A new generation of water management tools

Several key tools are being developed to assess water availability, sharing and delivery:

- Climate and rainfall-runoff models are used to assess the volume of water available for use in Pakistan
- Seasonal flow forecasting tools are used to predict water availability for the coming cropping season
- River system models support decision making in the sharing and timely delivery of water
- Groundwater models support decision – making in sustainable groundwater use as part of an integrated groundwater and surface water system
- Water quality assessments, support managing the delivery of safe and secure drinking water.

Impact assessment

Water management tools are linked within a framework to explore water related development scenarios for Pakistan. Scenarios of interest include:

- Climate change: assessing the impact of changes in volume and timing of river flows entering the irrigated plains of Pakistan
- Population growth: assessing the impacts on energy and food security into the future as a finite water resource is shared amongst a greater number of people. With a focus on impacts on the poor and vulnerable
- Infrastructure development: assessing the trade-offs between different development options. Understanding what this mean for the different provinces, local and downstream communities.

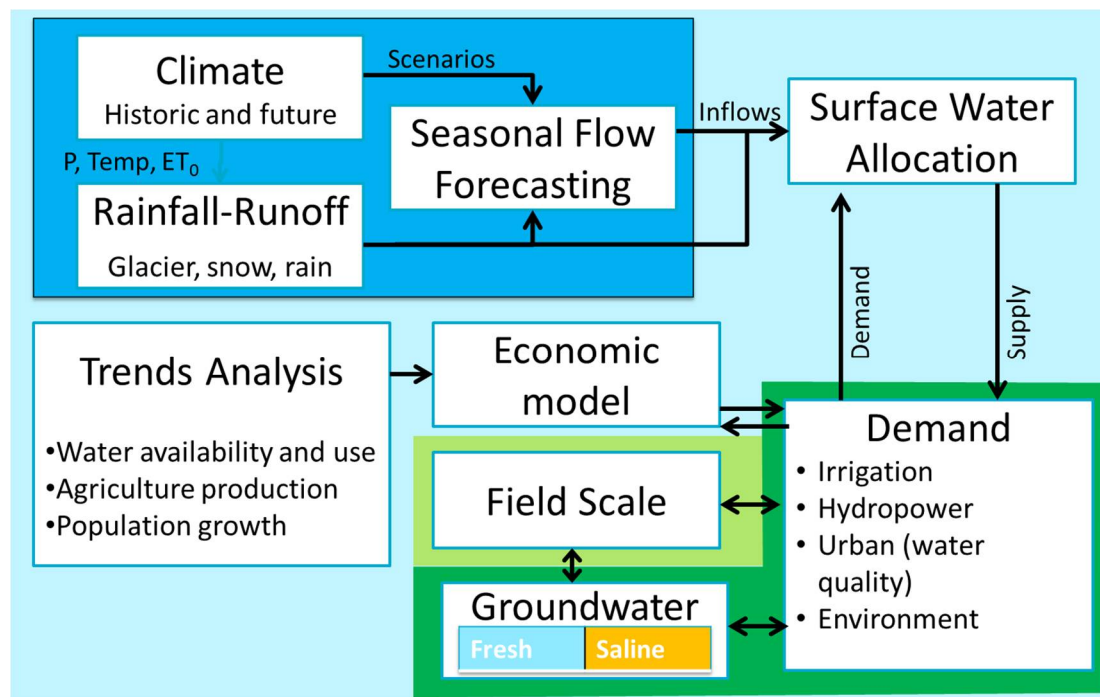


Figure 1 Indus Integrated Modelling Framework - linking field, irrigation district and basin scales

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