Supporting river basin planning through the Kamala Basin Initiative

The people of the Kamala Basin in East Nepal have a long history of dealing with too much water in monsoon and limited water in the dry season. Meeting the desire to increase agricultural production, develop local industries and support mining, will need careful planning and sound management. This project aims to support the development of a strategic river basin plan for water resources, something that the Government of Nepal can repeat in other water limited catchments.

The Kamala Basin in south-east Nepal is an important agricultural centre based around the Kamala Irrigation Project built by the Government of Nepal in the 1970s. The flat fertile plains enable growing staples such as rice and wheat for subsistence. However, it is a tough existence, and many working age men are migrating overseas to earn higher incomes. This creates its own challenges and has motivated the Government of Nepal to consider development strategies to improve local livelihoods, including participatory river basin planning.

The Kamala Basin Initiative aims to support river basin planning by quantifying the water available, identifying the future needs for irrigated agriculture, developing scenarios with stakeholders to explore development pathways and improving ecological knowledge for sustainable management.

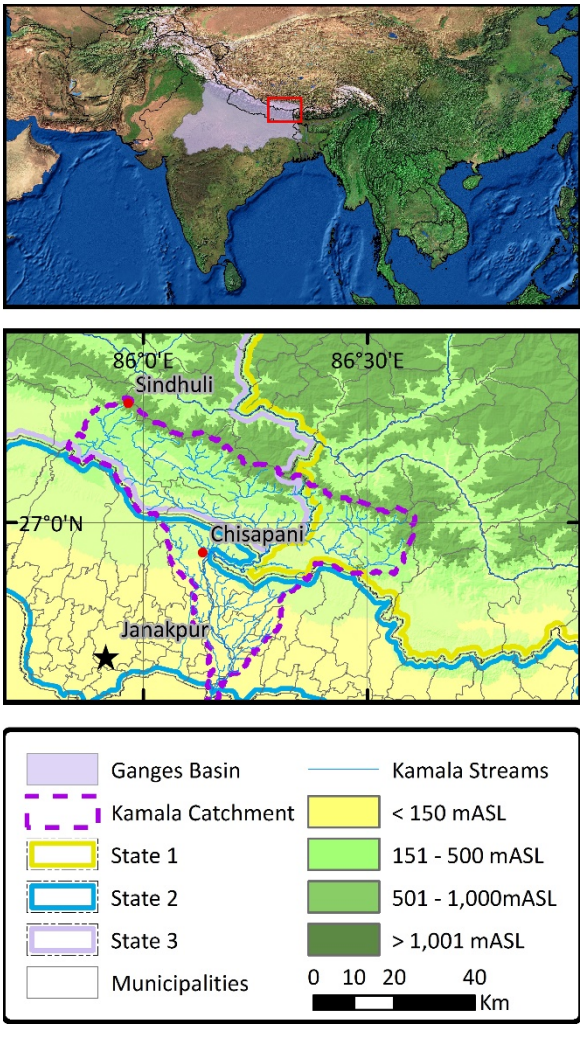


Figure 1 Location of the Kamala Basin

How much water is available?

The Kamala Basin intersects three states in Nepal (at the time of writing the states were still to be named). Rain falling in the Kamala Basin in State 1 and State 3 at around 1000 metres above sea level flows downstream into the agricultural plains of State 2 (Figure 1).

CSIRO is building knowledge about the surface water and has supported revisions to rainfall station locations, developed new gridded rainfall products and refined hydrological models of catchment runoff. Leading to better understanding of the timing and availability of water in major streams, including projected changes to water availability due to climate change.

Working with local modelling experts, CSIRO has improved models of the Kamala Basin hydrology. In addition to providing a quantitative representation of historical and current water resources, this model can be used to explore the likely water-related consequences of future development and climatic scenarios (Figure 2).

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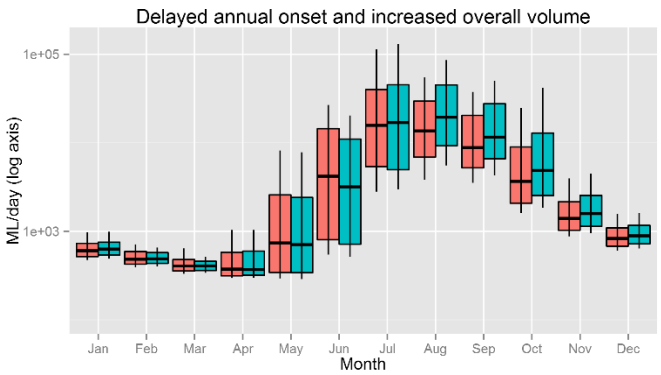


Figure 2 Monthly ranges of water flowing at Chisapani under two climate scenarios (red: current conditions, blue: CSIRO Mk3 current emission trajectory - RCP 8.5). River basin plans must be resilient to climate variability including later onset of monsoon, and an extended and more violent flood season

Water for irrigation

Irrigated agriculture is an important economic and social feature of the Kamala Basin. The predominant crops are rice during the wet season and wheat and maize during winter and the dry season. Production is limited to a maximum of two crops per year supplemented by irrigation to meet water demand.

Water for irrigation is supplied from the Kamala Irrigation Project. On the plains, barrages in the river divert water into a main canal and farmers divert water through secondary and tertiary canals. Further from the river in the downstream Terai plain, if irrigation occurs, farmers irrigate by pumping groundwater.



Figure 3 Multiple stakeholders will be involved in the planning process, such as those that use the water for domestic uses

The CSIRO SDIP project team maintains an up-to-date website for sharing material and news on project activities: <https://research.csiro.au/sdip>

Australian Aid

Sharing the benefits of water

A participatory planning process will be undertaken to identify the water needs, priorities and aspirations of different sectors and stakeholders (Figure 3). Support will be provided in this process for each sector and stakeholder group. Opportunities and risks of proposed developments will be explored through the synthesis of expert knowledge, analysis of biophysical and social data and development of empirical models.

A multi-criteria assessment process will be used to account for differing priorities and objectives and assist stakeholders in understanding crucial decisions, trade-offs and easy wins in the scenario development process. Proposed development actions for water planning will be identified with the aim to maximise the benefits and minimise negatives.



Figure 4 Kamala River: low lying agricultural areas in the midhills

Sustainable futures

Nepali scientists have a deep understanding of how water, moving through rivers and wetlands, supports ecological species (e.g. birds, fish, macro-invertebrates). CSIRO is working with young scientists to systematise and develop this knowledge of the river flow-ecology relationship. This knowledge will assist in identifying actions required to restore the Kamala River and associated ecosystems (Figure 4).

Partners

The Kamala Basin Initiative is undertaken as a multi-stakeholder partnership between the Government of Nepal and the Government of Australia. The implementing partners include CSIRO and WECS, Nepal via the consulting service from Nepal-based partners PEI (Policy Entrepreneurs Inc.) and JVS (Jalsrot Vikas Sanstha).

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FOR FURTHER INFORMATION

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