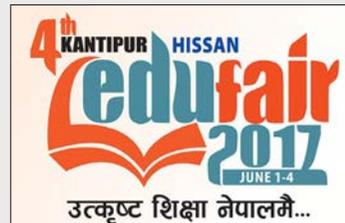


Letter to the EDITOR

COVER ALL YOUTHS

■ The fourth education fair was inaugurated with the motto of 'Excellent Education within Nepal' ('Kantipur Hissan education fair begins at Bhrikutimandap', June 17, Page 3). The recent SEE students will benefit from this fair where they can get advice on available courses, education quality, infrastructure and facilities, and fee structures. It is a platform to help students realise



their goals.

It is believed that Kathmandu still controls resources and holds power, and the HISSAN fair is also found to target students of the Capital. Most colleges are confined to the urban and semi urban areas around Kathmandu, but not all the students who sat for the SEE are able to join colleges in the city. Many students from rural areas are confused about choosing their faculty for the +2 levels. It would be meaningful when this umbrella association covers all youth groups who are seeking knowledge about higher education. This sort of fair should be conducted in different parts of the country to give all rural students knowledge about quality education.

Shobha Adhikari,
Purano Naikap

POLITICAL ACUMEN

■ It is unfortunate to see political parties bargaining for their own interests rather than for the nation's. After the second people's movement, parties wanted

Water management

River basin management approach could increase agricultural and hydropower productivity to improve Nepal's economic status



UTSAV BHATTARAI & SANTOSH NEPAL

As Nepal is going through a phase of economic development, a lot of water resources projects are being planned and constructed. Unfortunately, the country still takes the conventional project-by-project approach to development, which has its limitations. With a river basin approach, many sectors like hydrology, climate, ecosystem, floods and droughts, erosion and sedimentation, hydropower production, irrigation, and upstream and downstream linkages, among others, are considered in their totality.

The Government of Nepal explicitly states—in the Water Resources Strategy (2002), the National Water Plan (2005), and the Nepal Water Resources Policy (which is in the process of being finalised)—that proper harnessing of available water resources through a river basin management approach could increase agricultural and hydropower productivity and improve the economic status of the country.

For such an approach to work, we need solid scientific data and knowledge of the water resources in a given river basin. Current and future scenarios of the basin concerned need to be understood carefully. If the basin's future state can be forecast to a reasonable degree of confidence, the drivers of such changes can be identified and manipulated to bring about positive changes in the development process.

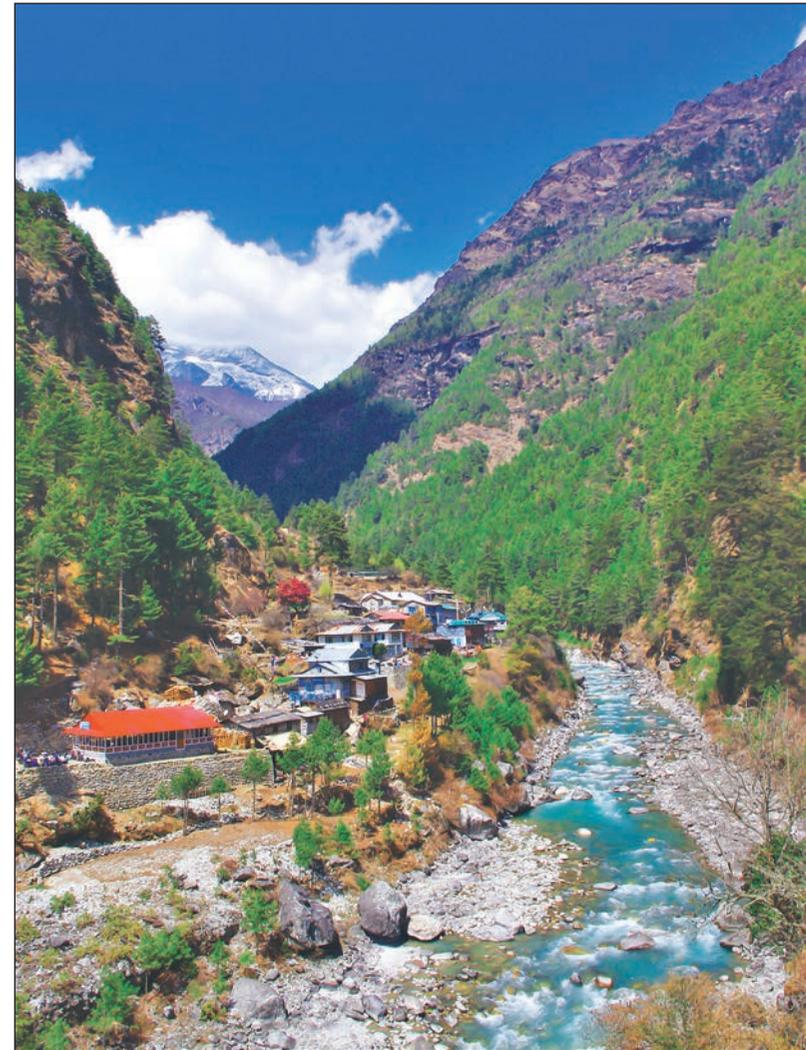
A watershed model

In this context, an assessment of the implications on the quantity and

quality of water due to current and future development is extremely important, and this is where watershed models are crucial. A watershed model is a simplified conceptual representation of various water-related natural and anthropogenic phenomena. Examples include the hydrological cycle, which can be approximated with a hydrological model; river flow dynamics, which can be represented by a hydraulic/hydrodynamic model; groundwater systems, which can be modelled with a groundwater model; basin level planning, which can be done using a water planning model; and hydropower production and energy planning, which can be characterised by a hydropower model. Watershed models vary in their basic forms and structures, and functionalities and capabilities, depending on the availability of data and their uses.

Understanding hydrological regime, water supply and demand scenarios, and associated changes is key to the assessment of water availability to support strategic planning for a given basin's development. Watershed modelling with a river basin approach helps collective decision making and coordination among key water sectors. The Koshi Basin Programme, an initiative at the International Centre for Integrated Mountain Development (ICIMOD), conducted a study from 2012 to 2016 with the International Water Management Institute (IWMI), with the aim of arriving at such an understanding. The study was conducted in several locations on the transboundary Koshi River Basin, and was modelled using a popular hydrological model, Soil and Water Assessment Tool (SWAT), and a basin level planning model, Water Evaluation and Planning system (WEAP).

Results obtained from the SWAT model show that the spatial variation of precipitation, evapotranspiration and available water within the Koshi



■ Dudh Koshi River has been widely used for hydropower, irrigation and livelihood purposes PC Santosh Nepal.

Basin is significant. There are large temporal variations in water balance components. Results of the study depict higher precipitation and water availability in the southern part of the basin compared to the northern portion. Water is available in surplus

during the monsoon with characteristic flooding in the Tarai in Nepal and Bihar in India.

On the other hand, there is acute shortage of water in many parts of the basin during the dry period. Further, seasonal and inter-annual

variability in water availability are expected to amplify in future climate scenarios. More than 50 percent of the basin is projected to see an increase in precipitation and consequently, the availability of water. The middle part of the basin (hills) is most affected while the uppermost part of the basin (mountains) is the least affected.

Holistic river basin concept

WEAP results also confirm that, at the annual scale, the Koshi River Basin is not a water-deficit basin. Agricultural demands rank highest, followed by domestic and industrial demands. Results further show that the construction of all 11 hydropower projects proposed by the Japan International Cooperation Agency (JICA) in the mid-80s can increase hydropower productivity and aid socio-economic development in Nepal. If these projects are operated to their fullest potential, about 30,000GW hours of hydropower could be generated annually in the basin. This is about 17 times the total energy Nepal imported from India in the fiscal year 2015-16, and will lead to the possibility of exporting surplus energy.

A holistic river basin concept based on strong scientific data and knowledge backed by research is necessary for the sustainable and speedy development of the water resources sector of Nepal. In this context, watershed models can be extremely useful in providing meaningful information about water availability, hydropower generation, supply-demand scenarios, extreme events such as floods and droughts, and collective decision making, as has been done for the Koshi River Basin.

Bhattarai is a Water Resources Modeler at Water Modeling Solutions Pvt Ltd; Nepal is a Water and Climate Specialist at International Centre for Integrated Mountain Development (ICIMOD)