

Understanding Water Availability and Demand in the Koshi Basin Using Water Resources Assessment Tools: WEAP and SWAT

Hands-on Training Workshop

Venue: Kanchenjunga Hall, ICIMOD

29 February – 4 March, 2016



Introduction and Background

A river basin has common biophysical, economic, social and cultural attributes that facilitates relations among those who live in them because of the commonality of shared resource utilization and emergent issues. Water resources assessment tools are needed to promote meaningful interaction and reconciliation of the interests of the various actors at a river basin scale to maximize benefits, such as irrigation and hydropower, while minimizing adverse events, such as floods and landslides.

The International Centre for Integrated Mountain Development (ICIMOD), with the support from the Department of Foreign Affairs and Trade (DFAT), Government of Australia, is facilitating a regionally coordinated Koshi Basin Programme (KBP) to generate knowledge base of water resources in the Koshi basin to ensure water security and resilient livelihoods. In collaboration with International Water Management Institute (IWMI), the program has developed water resources assessment tools using Water Evaluation and Planning (WEAP) system and Soil and Water Assessment Tool (SWAT) to evaluate water availability and demand in the Koshi river basin.

A five-day training program is proposed to inform the stakeholders about the capabilities of these tools to assess water availability and demand to support Koshi basin management. Participants will receive hands-on training on WEAP and develop working knowledge of SWAT applied to the Koshi basin. A detailed training manual and data for practice will be provided during the training course.

Objectives

The objective of the training is to inform the relevant stakeholders of China, India and Nepal about the available tools which could be helpful for the purpose of water resources planning at the basin and sub-basin levels in the Koshi River basin. Specific objectives are to provide:

- Share knowledge on how water resource assessment tools can be used to determine water demand and availability at the basin and sub-basin level;



- Basic level training on water resources assessment tools: WEAP and SWAT models;
- Hands-on training of the WEAP system and discussion of outputs from its application in the Koshi basin; and
- Demonstration of the SWAT and discussion of outputs from its application in the Koshi Basin.

Outputs

After successful completion of the participants will:

- Have a general understanding of how water resources assessment tools can be used to determine water demand and availability at the basin and sub-basin levels
- Understand and use the WEAP tool for the Koshi Basin
- Make changes and build additional scenarios on the WEAP system
- Have a general understanding of the SWAT and its application on the Koshi basin

Target Audience

This training is targeted at mid-level practitioners to policy/planning level professionals directly or indirectly related to water management activities at the basin/sub-basin level.

Schedule Overview

Day/Time	Session	
DAY 1: Opening and Overview		
9:00	Registration	Mr Govinda Shrestha
9:30	<p>Opening Session</p> <p>Welcome Speech</p> <p>Opening Remarks</p> <p>Remarks</p> <p>Introduction and potential of water resource assessment tools: WEAP and SWAT</p>	<p>Dr Arun Bhakta Shrestha, Programme Manager, River Basins, ICIMOD</p> <p>Mr Basanta Shrestha Director Strategic Cooperation, ICIMOD</p> <p>Mr Rama Nanda Prasad Yadav Director General, Department of Irrigation</p> <p>Dr Shahriar Md. Wahid, Programme Coordinator, Koshi Basin</p>
10:25	Group Photo	
10:30	Tea Break	
11:00	<p>Introduction</p> <ul style="list-style-type: none"> Brief introduction of the resource persons Overview of the training Introduction of participants and expectations 	Dr Santosh Nepal
11:30	<p>Introduction to WEAP</p> <ul style="list-style-type: none"> History, development of WEAP, licensing procedures Accessing help, tutorials and supporting documents Data requirements 	Mr Utsav Bhattarai
12:30	Lunch	
13:30	<p>WEAP Capabilities and Limitations</p> <ul style="list-style-type: none"> Capabilities of WEAP Limitations 	Mr Utsav Bhattarai and Ms Harshana Shrestha
14:30	Tea Break	
15:00	Application of WEAP on local water management : a case study from Sindhuli	Ms Harshana Shrestha, Dr Santosh Nepal and Dr Nilhari Neupane
15:45	<p>WEAP application and scenario building</p> <ul style="list-style-type: none"> Application of WEAP through case studies Discussion on potential of scenario building in WEAP 	Mr Utsav Bhattarai
16:45	Adjourn for the day	

DAY 2: Hands-on exercise on WEAP

9:30	Recap from Day 1	All participants
10:00	Getting to know WEAP <ul style="list-style-type: none"> • WEAP installation • Familiarizing with the WEAP graphical user interface • Setting up (dummy data) • Understanding the terminologies, calculation procedures and reporting formats 	Mr Utsav Bhattarai Ms Harshana Shrestha
11:00	Tea Break	
11:30	Building a model on WEAP at Dudh Koshi sub-catchment <ul style="list-style-type: none"> • Creating a new WEAP project • Adding supply and demand to the WEAP project (eg. irrigation and hydropower) 	Mr Utsav Bhattarai and Ms Harshana Shrestha
12:30	Lunch	
13:30	Running the Dudh Koshi WEAP model <ul style="list-style-type: none"> • Running the model • Viewing and understanding outputs • Exporting outputs in different formats 	Mr Utsav Bhattarai and Ms Harshana Shrestha
15:00	Tea break	
15:30	Making changes to the model <ul style="list-style-type: none"> • Background for possible changes • Making further additions • Running the model with changes • Viewing, understanding and exporting outputs • Comparing the changes with the base model 	Mr Utsav Bhattarai and Ms Harshana Shrestha
16:45	Adjourn for the day	

Day 3: Application of WEAP in the Koshi Basin

9:30	Recap from Day 2	All participants
10:00	Demonstration of the Koshi Basin WEAP model <ul style="list-style-type: none"> • Walking through the base Koshi WEAP model 	Mr Utsav Bhattarai
11:15	Tea Break	
11:45	Continued... <ul style="list-style-type: none"> • Understanding the inputs 	Mr Utsav Bhattarai
12:30	Lunch	
13:30	Continued... <ul style="list-style-type: none"> • Running and viewing the model output for Koshi Basin 	Mr Utsav Bhattarai
15:00	Tea break	
15:30	Changing the model and understanding outputs <ul style="list-style-type: none"> • Viewing and understanding the outputs • Discussion 	Mr Utsav Bhattarai
16:45	Adjourn for the day	

Day 4: Different scenarios for the WEAP system in the Koshi Basin

9:30	Recap from Day 3	
10:00	Understanding different water demand scenarios <ul style="list-style-type: none"> Background of the different scenarios modeled for the Koshi Basin Understanding how these scenarios have been built into the model 	Dr Shahriar Wahid and Mr Utsav Bhattarai
11:00	Tea Break	
11:30	<u>Interactive discussion</u> on the different scenarios <ul style="list-style-type: none"> Identifying other possible supply/demand scenarios for the Koshi Basin 	All participants
12:30	Lunch	
13:30	Analyzing scenarios for application in WEAP <ul style="list-style-type: none"> Analyzing whether the identified possible scenarios can be modeled in WEAP Notes on how the selected scenarios can be built on the existing model 	Mr Utsav Bhattarai and Dr Santosh Nepal
15:00	Tea break	
15:30	Hands on exercise of applying one new scenario in the WEAP system in Dudh Koshi catchment	Mr Utsav Bhattarai and Ms Harshana Shrestha
16:45	Adjourn for the day	

Day 5: Demonstration of hydrological modeling in SWAT

9:30	Recap from Day 4	
10:00	Basic concepts of hydrological modelling system	Dr Santosh Nepal
10:20	Introduction to SWAT <ul style="list-style-type: none"> Capabilities and limitations SWAT resources (software download, support documents, google groups) Brief explanation of the structure of SWAT Data requirements in SWAT (types and formats) Hydrological processes and different modules in SWAT 	Mr Sonu Khanal Dr Santosh Nepal Mr Utsav Bhattarai
10:45	Tea Break	
11:15	Demonstration of SWAT application <ul style="list-style-type: none"> Familiarizing with SWAT environment, menus and toolbars Demonstration of creating a complete SWAT project for a sample area (using dummy data) Running the model Viewing outputs Calibration and Validation Understanding the Koshi Basin SWAT model 	Mr Utsav Bhattarai and Mr Sonu Khanal
12:30	Certificate distribution	Dr Arun B. Shrestha
12:45	Vote of Thanks	Dr Santosh Nepal
13:00	Lunch	