OVERVIEW OF THE WATER ADAPTATION TRAINING SESSION

Description of the basin

The Training Basin comprises of three watershed, namely main, main tributary and tributary watersheds. These watersheds are the sources of water for main river, main tribubary river and tributary river. There are two reservoirs, namely Upper Reservoir (UR) and Lower Reservoir (LR) constructed along Main river.

Aquifer A is the main source of water for irrigated agriculture in Agriculture Area A. The return flow from this irrigated area flows into Main River downstream of the Upper Reservoir. Below the discharge point is an important freshwater ecosystem that is a major fish producing area.

Downstream of the fishery area is where Industry A withdraws its water and disharges its untreated wastewater. Four kilometers downstream is the confluence of the Main River and the Main Tributary River.

The Main Tributary River gets its water from the Main Tributary Watershed and the Tributary watershed. A run-of-the-river hydropower plant is located 5 Kilometers from the confluence of Main Tributary and Tributary rivers. Four Kilometers downstream is the water abstraction for Industry B. Industry B return flow is discharged into the Main Tributary river a few kilometers downstream.

At the confluence of Main River and Main Tributary River is the Lower Reservoir which supplies water to City A. City has a wastewater treatment plant which discharges the treatment water into the Main River approximately 13 kilometers from the Lower Reservoir. Some of the wastewater from City A is discharged at the same point.

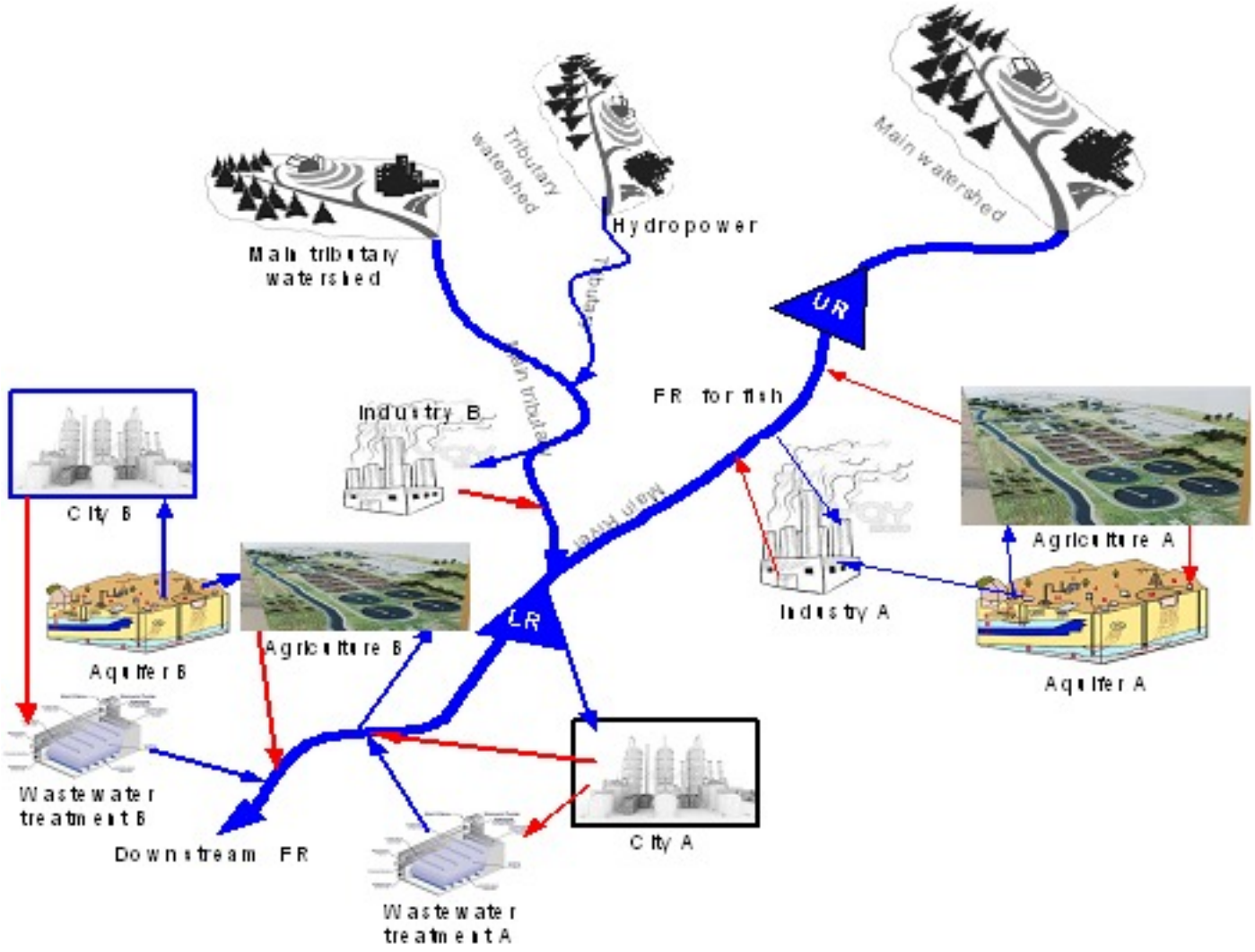


Figure 1 schematic representation of the Training River Basin.

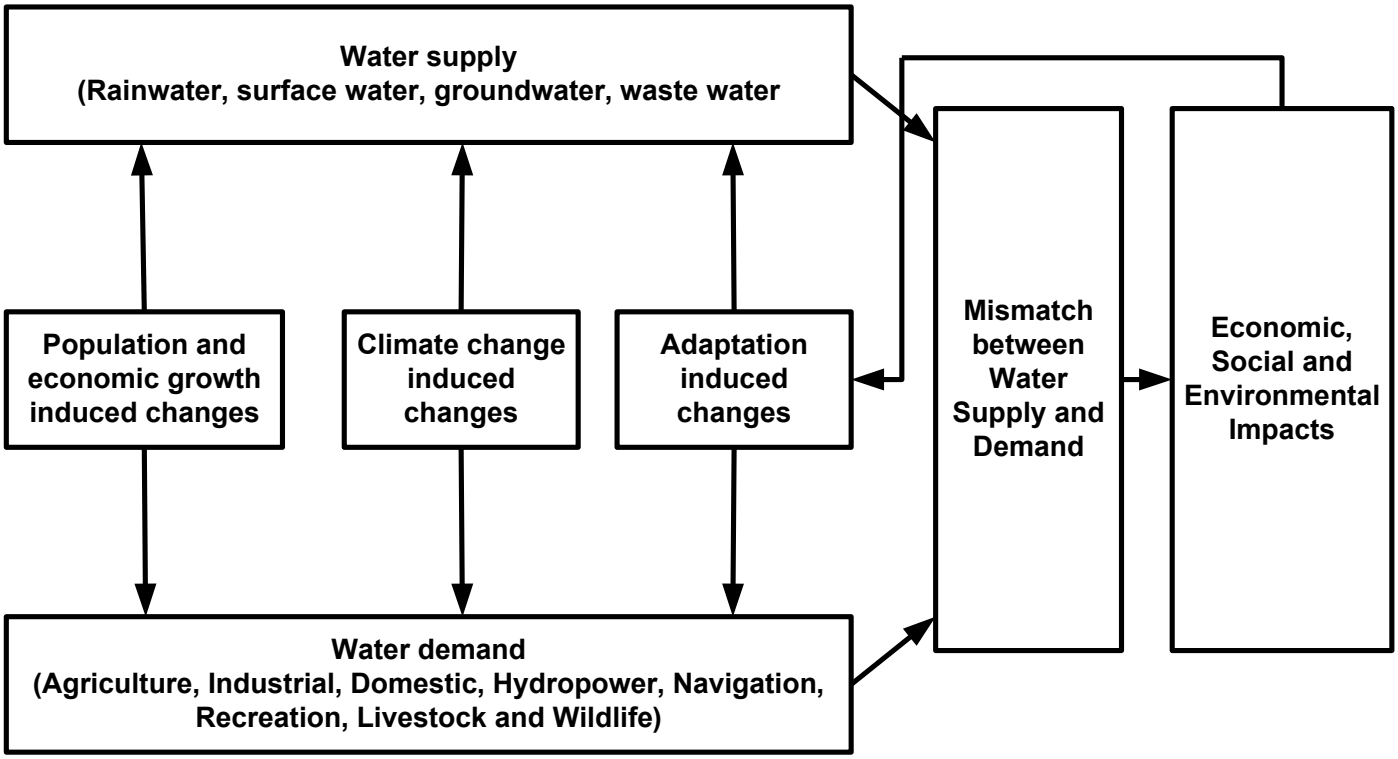
Three Kilometers downstream of the wastewater discharge point is the abstraction point for irrigated area B. Irrigated area B also gets additional water from Aquifer B which also supplies water to City B. Irrigation return flow from Agriculture area B is discharged into Main river 25 km downstream of the Lower reservoir.

Wastewater from City B is treated by wastewater treatment B before being discharged into the Main River 10 Kilometers before it reaches the sea. Downstream of the discharge point is a downstream flow requirement monitoring point which seeks to attain environmental flow requirements in the river delta area.

The Framework of Analysis

Using the analytical framework shown below, the exercise will seek to answer the following questions:

1. How will climate change alter water demand and supply?
2. How will population growth and economic development alter water demand and development (dam construction, and water supply)?
3. What are the water demand projections?
4. What are the water supply projections?
5. What will be the resulting mismatch between water demand and supply?
6. What adaptation measures are likely to be used to reduce the mismatch between water demand and supply? - Demand management strategies such as reallocation of water, reducing demand and water supply management strategies such as water storage, flood control, augmenting supply from other water sources
7. What will be the mismatch between water demand and supply after the adaptation measures are implemented?

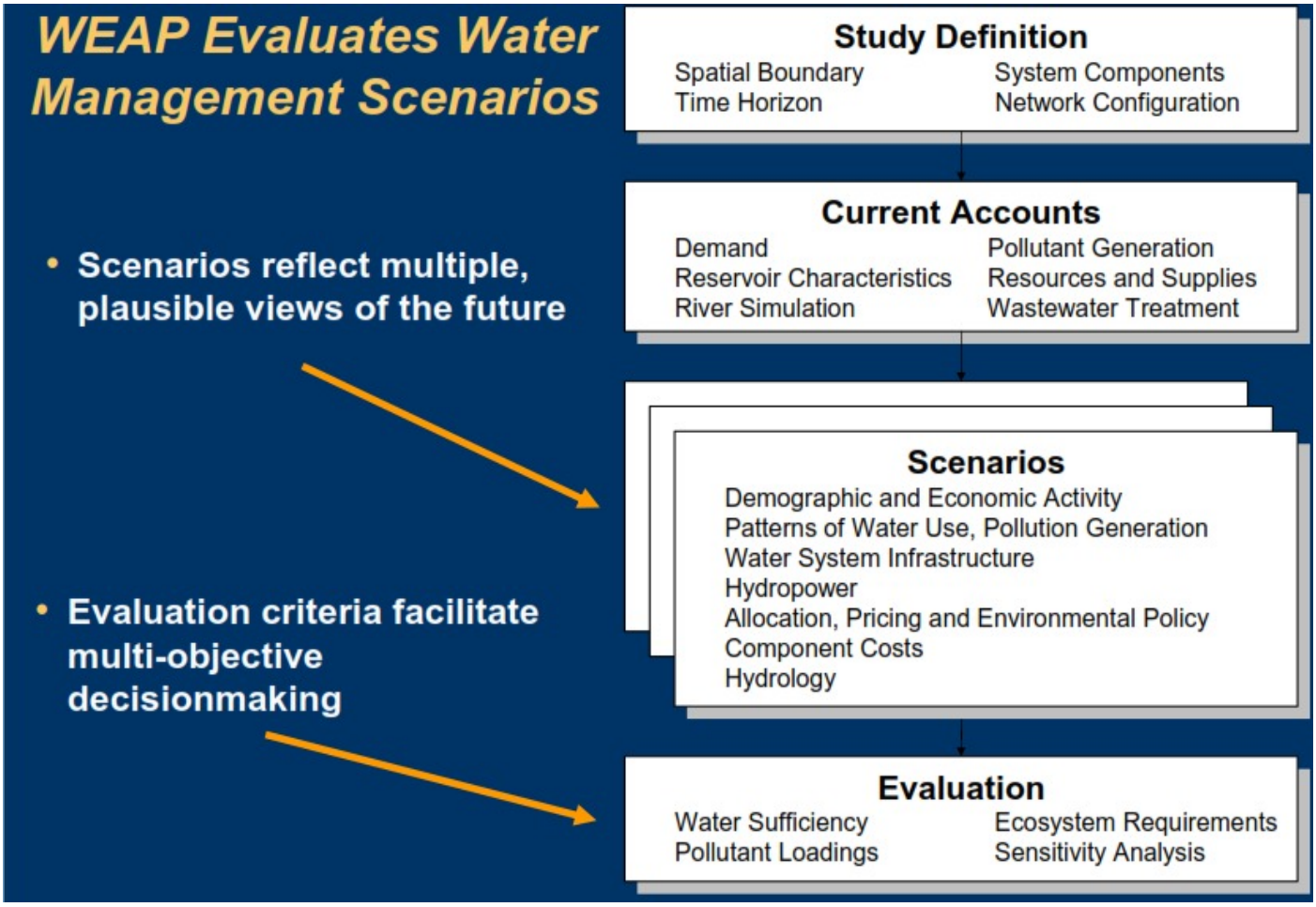


The WEAP Model

WEAP is a practical integrated model for water development, based on water demand of various uses. It combines a simple GIS-based physical model of water supply and availability, demography, and changes in water demand of various uses. Through practical tools it enables to bring water demand planning and allocation on equal footage to water supply, both in space and over time.

WEAP can simulate a broad range of natural and engineered components of water systems, including rainfall runoff, baseflow, and groundwater recharge from precipitation; sectoral demand analyses; water conservation; water rights and allocation priorities, reservoir operations; hydropower generation; pollution tracking and water quality; vulnerability assessments; and ecosystem requirements. Different scenarios can be generated to explore potential future effects of changes in runoff, streamflow and water supply (e.g. through climate change, land use change, implementation of water recycling) and water demand (e.g. population growth, irrigation, economic development).

For more information, see www.weap21.org



The Data Requirements

The data required to address water adaptation to climate change issues includes:

1. Key assumptions that includes drivers of change, monthly variation and elasticity
2. Demand site data which includes water use, loss and reuse, demand management, water quality, cost and priority setting.
3. Hydrology which includes rainfall, surface and groundwater
4. Supply and resources which captures the supply and demand at various points along the network.
5. Water quality which includes pollutants and wastewater treatment
6. Scenario analysis data which includes climate change projects, hydrological consequences, adaptation measures and their impacts.

The data sets for this exercise are contained in the

Excel sheet - TrainingRiverAsiaDataset.xls