

Development of an Integrated River Basin Strategy in the Yangtze River Basin (*)

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The Yangtze, the largest river of China, descends 7500m from the pristine Tibetan Plateau to the East China Sea over the course of its 6300 km journey (Fig. 1). The unique system of forests, rivers and lakes form the Chinese Eden of Biodiversity. The mighty river with an area of 1.8 million square km has been extensively modified for thousands of years.



While the basin is recognized as being among the most significant ecosystems in the world, the region is severely degraded due to that deforestation, soil erosion, shrinking of lakes, floods and pollution have posed the Yangtze with a series of challenges for its sustainability. Besides the increasing threats of rapid population growth, industrial and agricultural development as well as urbanization, the management of the Yangtze River in China is very complicated and involves various central government sectors, provincial and municipal governments. However, there are underway two major gaps of which are the lack of a systematic comprehensive river basin plan, which should, from the perspective of national strategic development, set the river basin conservation objectives and call for action by all related parties, and the lack of effective collaboration and cooperation mechanisms among various governmental departments due to the current sector-oriented river basin management, and a high degree of centralization.

The parallel of two sets of planning and implementing systems causes inconsistency and conflicts on the ground. There is an urgent need to establish an Integrated River Basin Management (IRBM) Strategy in the Yangtze Basin, which should cover the common vision, objectives, goals and targets to handle firmly some regional and local challenges leading to reduced ecosystem functioning and loss of life and property such as;

Figure 1. Geographical location of Yangtze River Basin of China

- Lack of both integrated and sectoral based land use planning at regional and landscape scales
- Construction of dams and dykes that cut off natural links between the River & Its Flood Plains (including thousands of lakes)
- Wetland clearance for farmlands, urbanization and industry
- Unsustainable fishing
- Water pollution and eutrophication
- Sedimentation and flooding

The IRBM Strategy employs as well some tools such as SWOT Analysis to reveal positive and negative aspects of each wetland zone at regional level and to address a myriad of actual questions through defining some technical pursuits or implementation explicitly as follows;

| Wetland Zone | Threats | Outcomes | Opportunities/Potential solutions |
|-------------------------|---|--|--|
| Upstream of 3 Gorge Dam | Livestock production (1) Global warming (2) Deforestation (3) Agriculture/industry (4) | Over-grazing (1) Changed hydrology regimes (2), (3) Soil erosion (1), (3), (4) Water pollution(1), (4) Wetland loss and degradation (1), (2), (3), (4) Loss of biodiversity and ecosystem services (1), (2), (3), (4) | (1) Livestock and grassland management (2) Afforestation and/or landscape reclamation (3) Standards/compliance (emission control) (4) Land use planning |
| Flood Plain | Hydrological infrastructures (1) Industries (2) Urbanization (3) Agriculture (4) | Changed hydrology regimes (1), (3) Water pollution and eutrophication (2) Wetland loss and degradation (1), (3), (4) Loss of biodiversity and ecosystem services (1), (3), (4) | (1) Reconnection of rivers and lakes (2) Dam management (3) Wetland restoration (4) Land use planning |
| Estuary Area | Industry (1) Urbanization (2) Agriculture (3) Fishery (4) Navigation (5) | Water pollution and eutrophication (1), (2), (3), (4), (5) Wetland loss and degradation (2), (3), (4) Loss of biodiversity and ecosystem services (2), (3), (4), (5) Changed hydrology regimes (2), (3), (5) | (1) Enforcement of environmental standards (2) Reconnection of rivers and lakes (3) Land use planning (4) Fisheries Management Plan (5) Fish passageways (6) Protection zones |

It should be made in a systematic process, the main procedures include establishment of Task Force, provision of data and information, engagement of key stakeholders, capacity building/training, consultation process, draft vision and goals and objectives, identification of resources required, planning, legislation, institutional setting, and finalization of the strategy.

Some indicators can be used to evaluate the success of any IRBM strategy, including the increased wetlands, improved water quality, reduced flood frequency and loss, and restored/maintained biodiversity, social and economic viability. The strategy should be reviewed every 3-5 years by taking into account of partners' feedback, impact assessment, new opportunities and challenges, update/new information as adaptive management of the strategy.

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