IWRM Action Hub

CASE STUDY

China: Yangtze River Basin Climate Change Adaptation and Vulnerability

Summary

The Yangtze River Basin has been severely affected by climate change. To address this, the Yangtze River Basin Climate Change Vulnerability and Adaptation Report has been drafted to evaluate the impact on representative ecosystems and water resources, and pinpoint adaptation strategies. The experience has demonstrated that good adaptation measures should consider not only climate itself, but also other factors, such as economy, technology, as well as social and cultural norms.

Background

The Yangtze River Basin (YRB) is commonly referred to as the cradle of the Chinese civilization. It covers an area of 1.8 million km^2, encompassing about one fifth of China's total territory, one third of the nation's total population, and one quarter of its total arable land. The YRB is also a major economic zone, contributing 41% of GDP, 35% of the nation's total grain production and 31% of its forest area in 2007. The river basin is also a home to many rare and endangered species, such as the giant panda, Yangtze River Dolphin, and Yangtze Sturgeon.

However, climate change is now having an enormous impact on the river basin management. The YRB has experienced warmer temperatures over the past few decades. According to climate model projections, temperatures in the YRB will continue to rise during the first half of the 21st century, with precipitation staying flat. Extreme climate events, such as flooding, drought, heat waves and disastrous snowstorms, will become more frequent in the 21st century and especially in the last two decades. the future warmer climate will accelerate the melting of the glaciers decreasing the glacier area significantly increasing the runoff during the same period.

Besides this, the changing climate will have greater influences other sectors, such as agriculture, forestry, and the environment. Climate change alone will reduce grain (rice, corn, and wheat) production in the YRB as well as will make coastal cities like Shanghai more vulnerable to sea level raises, extreme climate events, as well as natural and human-induced disasters.

In addition, climate change will alter the composition of forest species, which may exacerbate the loss of biodiversity. Long-term human activities in the basin are also having a devastating impact on species movement/migration due to the increased fragmentation and isolation of forests.

Actions taken

One of the biggest issues for the governor and experts are determining how to assess a river basin's vulnerability and ability to adapt to climate change. WWF, together with over 20 experts from the Chinese Academy of Sciences (CAS), China Meteorological Administration and Fudan University have

drafted the Yangtze River Basin Climate Change Vulnerability and Adaptation Report in 2009.

This report evaluates the impact of climate change on representative ecosystems and water resources in the Yangtze River basin, pinpoint adaptation strategies, and provide support to decision makers. WWF's field office also investigated the relationship between water level change and biodiversity loss in Poyang Lake, China's largest freshwater lake, and also worked with experts in nature reserves to look for adaptation strategies that keep the lake's assets in balance.

It is the first ever climate change vulnerability assessment on the Yangtze River Basin which provides substantial strategic plans and management measures recommendations to help Yangtze River basin to socioeconomic and ecological systems respond and adapt to climate change under the dramatic threats of climate change. The report have recommended the strategic plans and management measures that should be taken for different sectors and ecosystems to adapt to climate change in the 21st century.

Outcomes

There are measures to be implemented by national river basin level managing authorities, thus it serves a roadmap for climate change adaptation.

Key recommendations of this report include:

- Build capacities to deal with climate change by improving economic status, living conditions and public facilities,
- Promote Integrated River Basin Management,
- Adjust cropping systems, breed new strains and improve crop management practices to adapt to new climate,
- Protect natural forests from logging by establishing a new ecological compensation system in the YRB,
- Protect the permafrost and biodiversity from human disturbances, Include wetlands in the integrated river basin management plans, and
- Adjust and optimize the economic structure by promoting low-carbon development in urban

areas in the YRB.

Lessons Learned

Good adaptation measures and practices should consider not only climate itself, but also other specific factors, such as economy, technology, as well as social and cultural norms.

Experiences gained from this report could be applied and used and evaluate the river who are under the threat of climate change.

Given the complexities and uncertainties associated with climate change, adaptation should firstly consider a "no-regrets" strategy, which does not require additional cost.

A "free-ride" strategy should be considered, where adaptation to climate change is a by-product of other socioeconomic activities.

Synthesizing previous experiences and lessons on climate change adaptation is extremely important to the success of future actions.

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