

Global water problems are becoming more serious

Since the latter half of the 20th century, rapid population growth and expanding human activities have given rise to a variety of serious water problems at the global, regional, and local levels. These problems include global climate changes due to increases in carbon dioxide and other greenhouse gases, water shortages due to imbalances between water demand and supply, water pollution and ecosystem deterioration due to increases in urban and industrial wastewater, and increased potential for flood damage caused by improper land use.

The expression, "the 21st century will be an age of water," embodies both the concern that water issues may cause international conflicts and the hope that these same issues will promote international cooperation.

Significance of scientific approaches in understanding the global water cycle

Except for fossil water, all water on the planet Earth circulates throughout the atmosphere, geosphere and hydrosphere. All life on earth is dependent upon the water circulating through these systems.

Expanding human activities have greatly impacted this water cycle, resulting in growing number of global water problems and life-threatening hazards, including the more frequent occurrence of floods and droughts.

To solve these water problems, we must promote science-based research efforts to clarify the structural relationship between the water cycle and human activities, as well as establish a sound and sustainable relationship between them.

As used in this text, the term "global water cycle" covers not only variations and changes in the water cycle caused by global climate variations and changes, but also the water issues that these variations and changes induce at the regional and local levels.

Steps toward resolving water issues in Asia

Asia has a number of water cycle variations and water problems that are remarkably different from those in Europe and North America. These dramatic differences are related to climatic conditions associated with the Asian

monsoon and with land conditions formed by unique plate tectonic dynamics. Water utilization, flood disaster mitigation measures and environmental conservation are all water issues that are unique to the Asian monsoon. Issues arising from the geographical characteristics of the region include large seasonal and annual variations in precipitation, agriculture (primarily paddy cultivation), and the urbanization of alluvial flood plains. There is also a wide variety of regional experience and knowledge in dealing with specific water issues.

Rapid growth since the latter half of the previous century has made Asia the most densely populated region in the world. Asia is currently home to about 60% of the present world population of 6 billion. The Asian population is still growing and is projected to reach about 5.3 billion by the middle of this century. This growth will worsen Asia's water problems.

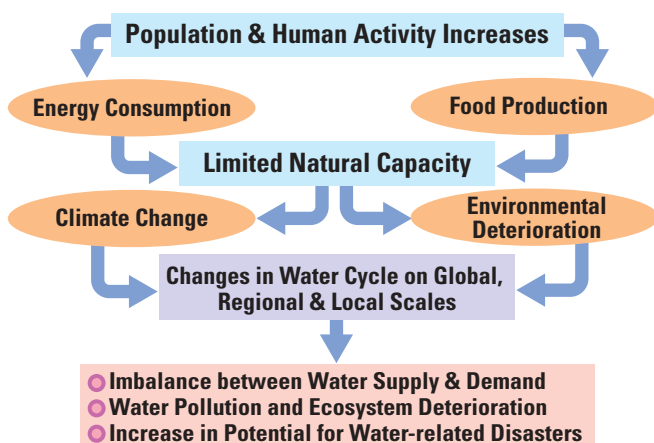
Japan is located in monsoon Asia. Because it has already undergone very rapid population growth, its experiences with water and population issues may be useful to other Asian countries that are facing similar issues.

Water issues are some of the most important policy challenges in Japan

The Second Basic Plan for Science and Technology (2001-2005), which was enacted in March 2001 by the Cabinet of the Japanese Government, describes a policy that emphasizes research and development (R&D) from national and social standpoints. In addition to the basic science areas, the plan focuses on four prioritized fields: life sciences, information technologies, the environment, and nanotechnology. In September 2001, the Council for Science and Technology Policy (CSTP), which was formed under the Cabinet Office, adopted a plan called "Promotion Strategies in Prioritized Fields," which was proposed by the "Expert Panel on Promotion Strategies in Prioritized Fields," a smaller body within the CSTP.

Regarding the environment, several topics were recognized as being critical. These include establishing scenario-driven R&D, forming a comprehensive and interdisciplinary framework, merging social and human sciences, and providing projection and/or early warning information. In order to promote these topics, five research initiatives were established, one of which was the Global Water Cycle Research Initiative (GWCRI). This initiative was launched in April 2003.

Development of Global Water Problems



Projection of World Population

