

Editorial

Water is not only a basic human need but also is an essential component for the proper functioning of ecosystems. Human survival and environmental conservation depend on water. For physical, technological, economic, environmental and health reasons, the amount of water that is available for use at any time at any specific location is limited. The main issue of water management is thus how to ensure that enough water of the right quality and quantity is available for various human and ecosystem uses, cost-effectively and reliably on a long-term basis.

Past experiences indicate that poverty eradication in the developing world simply is not possible without proper development and management of the limited water resources available on a sustainable basis. Food production and large-scale electricity generation are not possible without water, and water is also a prerequisite for industrial development. Human and ecosystem health are also directly dependent on the availability of the right quality of water in appropriate quantities in a timely manner. It is now evident that water and socioeconomic development of the developing world are closely interrelated: one affects the other, and is in turn affected by the other.

The inter-linkages between water management, poverty alleviation and socioeconomic development can be better appreciated and understood by examining the case of Gujarat, one of the most progressive states of India, which has been suffering from perennial water scarcity, where non-availability of clean and safe drinking water has raised serious threats to the existence of about 20 million people and millions of animals. Economic and industrial development of the region is now being constrained because of lack of sufficient quantities of water. Prolonged water scarcity is contributing to environmental and ecosystem degradation.

The water scarcity conditions in Gujarat have become increasingly serious with the passage of time. If the current trends continue, during the next 25 years—even with the occurrence of normal monsoons—the state would face serious water shortages of around 7000 MCM per year. Groundwater in northern Gujarat is now mostly available at an average depth of 200 to 300 m. The groundwater levels have been steadily declining in this region as water is continually being pumped to meet the domestic, agricultural and industrial needs, and because the natural recharge rates regularly fall short of high water abstraction rates. Since water has to be pumped from greater depths, the real economic cost of this process is steadily increasing. Also, the qualities of water at lower depths often leave much to be desired because of high degrees of contamination with undesirable elements.

The quality of drinking water has already become a serious concern in the state. Of 18 028 villages, around 2800 have high fluoride concentration, around

800 suffer from high nitrate contamination, and another 1000 have excessive salinity. In North Gujarat and Saurashtra (south-western Gujarat), the incidences of dental and skeletal fluorosis and kidney diseases are already very high, resulting in early ageing and permanent disability. All these are contributing to untold human suffering through ill health, higher medical bills and reduction in economic activities. Children are the worst sufferers, with deformed teeth and bones, which have already become a common sight in many rural areas. With such serious health and economic handicaps, the future prospects for a decent life for these children are not bright. Unless the present trends are drastically reversed within a short period of time, the future, however it is looked at and from whichever direction, appears to be gloomy.

The social consequences of this water scarcity are also equally undesirable. For example, women in the scarcity areas have to undergo the daily drudgery of fetching water from long distances, sometimes up to 8 km. Lack of access to safe drinking water, time lost in collecting whatever quality of water is available, effects of head-loading on women's and female children's health, and the overall burden of women's household responsibilities all have adverse impacts on their health, and also on general family welfare. This is steadily being reflected in their dwindling income-earning ability. The real issue, then, is how sustainable development can be a reality under such acute water-scarcity conditions, where the economic potential and income-generating capabilities of people are seriously constrained. In many urban areas of northern and southern Gujarat, water availability for domestic uses even for one hour each day has now become a luxury. Water conflicts are becoming increasingly common between various uses, and between rural and urban populations because of serious shortages of available water.

The difference in the availability of water in the different regions of the state has already had serious adverse impacts on the socioeconomic development of the water-deficit regions. Such intra-state regional imbalances have caused social, cultural and political disruptions, which are detrimental to the harmony and development of the state as a whole. If the problem is not resolved in the near future, these disruptions are likely to worsen. It is no coincidence or surprise that the literacy rates in the water-deficit districts are much lower than the overall state average. In contrast, in the water-surplus districts, the literacy rates are higher than the state average. This difference may be attributed, *inter alia*, to the daily struggle to obtain enough water in water-deficient areas, which means education of children no longer remains a priority for the parents since their survival needs become more critical and urgent. The low level of economic activities in the water-deficit areas is reflected in lower employment rates, which in turn have adverse impacts on the educational levels of children, especially girls, as well as on family nutrition, health and welfare. These deficit areas continue to remain economically and industrially backward, and poverty becomes more endemic, especially in contrast with the water-surplus districts, which are becoming increasingly more industrialized, leading to more employment generation, higher levels of economic activities, and better lifestyles for the people. Thus, the water-scarce areas are becoming increasingly more marginalized and underprivileged.

Perennial water shortages have led to migration of hundreds of thousands of people, dislocating them economically, educationally, socially and culturally

from their roots. Migration of people and animals over long distances in search of water and pasture has now become a regular event. Accordingly, any attempt to formulate development plans for various disadvantaged regions must take into account the fact that all people have the right to life, shelter, food, health, education, employment and a clean environment. If this is not possible, all the rights enshrined in the Universal Declaration of Human Rights, International Covenant on Economic, Social and Cultural Rights and the UN Declaration on Right to Development will become paper exercises only. It is clear that sustainable development in an arid state like Gujarat is simply not feasible if the issue of safe water availability cannot be solved on a long-term basis.

A major component of the sustainable development of the entire state thus requires transfer of water from the water-surplus southern region to the water-deficient region in the north. This will be made possible through the Sardar Sarovar project, which is discussed in considerable detail in this issue. A comprehensive water policy formulated for the state includes not only a plan for large-scale water transfer but also use of small-scale infrastructures for rainwater harvesting, over 10 000 of which have been constructed in the last year alone.

This Special Issue deals with the different components of water development and management for the state of Gujarat. It provides insights on the much discussed Sardar Sarovar Project, including macro aspects of its costs and benefits, as well as objective analyses of its social, economic and environmental consequences. Important topical issues such as resettlement and NGO involvement are also discussed in detail. The Issue also analyses the linkages between large dams, sustainable development and the environment from the perspective of the developing countries. In addition, after some six years of deliberation, the Supreme Court of India gave its landmark judgment on the Narmada Dam in mid-October 2000. The highest court of the country listened to all the submissions from governments (central and states), hundreds of institutions, NGOs and experts, both for and against the project. It basically approved the project as is, and said "Every endeavour shall be made to see that the project is completed as expeditiously as possible".

This Special Issue contains analyses and conclusions from numerous in-depth studies that have not been easily available earlier. Very few people know, for example, that contrary to what is widely believed, this is one of the most studied projects in the developing world from both the social and environmental viewpoints. Furthermore, the current resettlement policies of the state of Gujarat are one of the most generous in the developing world. Many NGOs are actively assisting the Government of Gujarat to implement the resettlement policies, and the main anti-project NGO, Narmada Bachao Andolan (NBA), has never carried out any development project at the community level.

Efficient development and management of water resources in an arid state like Gujarat is complex, and it will become even more complex in the future. This Special Issue analyses the present status of water development in the State, as well as plans for the future. We firmly believe that the Sardar Sarovar project is a means to an end, the end being improvement in the standard of living and quality of life of millions of people in the very arid region of the state. Because of all these facts, not surprisingly, in 1994 *TIME* magazine identified the Narmada Valley development, of which Sardar Sarovar is a part, as one of the

eight wonders of the modern world abuilding. It is now our turn to make this project a reality.

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