

# Adaptation Activities In India

BY RAJASREE RAY

INDIA IS NO STRANGER TO CLIMATE and weather induced vulnerability. Given her extreme climate sub-zones and volatile weather, these objectives have been embedded into the policy matrix for decades. Drought, flood and income proofing have been part of the objectives of many infrastructure projects and social programs through the successive five year plans. The *Indira Gandhi Canal* that carries water to the heart of the Rajasthan desert, the recent initiative to revitalize the 100,000 plus natural water bodies, and the proposal to link the major rivers in the country through major engineering, are just a few examples. However, climate change induced

adaptation, as it is now understood, was not the underlying perception behind many of these activities. In any case, anthropogenic climate change concerns are more recent, relative to development planning which commenced more than 50 years ago.

Smith et. al (2000) define adaptation as adjustments, whether passive, reactive or anticipatory, that are proposed as a means for ameliorating the anticipated adverse consequences associated with climate change. These adjustments can happen in the ecological, social or economic systems (IPCC 2001). To be effective, adaptation measures should ideally address both short-term and long-term concerns. Short-term adaptation measures generally relate to immediate relief



Domestic and municipal waste producing biogas for cooking and electricity generation.

and rehabilitation programs in the aftermath of a calamity or natural disaster management. Short-term measures may also involve proactive measures like evacuation/relocation of the population facing adverse climate conditions. Long-term adaptation strategies, on the other hand, should aim to empower the vulnerable sections of the people—those living in the drought prone, flood prone, low lying and coastal areas—to help them develop robust coping mechanisms against possible effects of climate change.

India, with its fragile ecosystems, diverse terrain, rich biodiversity and long coastline, is also vulnerable to climatic variations. Studies have projected that India is likely to suffer from long-term adverse impacts of climate change, such as (a) rise in the mean winter temperature (b) decline in the summer rainfall leading to unfavorable consequences for agriculture, drinking water supply and hydropower generation (c) melting of glacial ice that can drastically reduce water flows in the rivers of the northern plains (d) reduction in the duration of crop cycles, and shortening of the grain fill period that could substantially reduce agricultural productivity and output (e) sea level rise that could inundate low lying areas, coastal marshes and wetlands, and erode beaches (f) increased flooding, erosion and salt intrusion in the deltas that could result in loss of coastal mangroves and fisheries (g) migration from the coastal areas and (h) increase in vector borne diseases due to the rise in temperature and humidity levels.

India's huge mass of poor people, residing predominantly in areas with little means to weather possible climate change impacts, exacerbates India's vulnerabilities and puts additional stress on its socioeconomic system, which is already facing pressure due to rapid urbanization and industrialization. For this reason, adaptation is critical for a country like India, which has no choice but to develop effective strategies for adapting to probable climate change impacts.

## India's adaptation activities

INDIA HAS YET TO DRAW UP PROGRAMS aimed exclusively at addressing critical vulnerabilities to climate change. In other words, India does not implement any adaptation schemes, *per se*, but has made substantial efforts to integrate adaptation into development schemes. Currently, several social sector development schemes that emphasize livelihood security, well-being of the weaker sections of society, and rural infrastructure are under implementation. In many ways, these programs reflect the short-term and long-term goals of adap-



Girl working a treadle pump in Mirzapur village, Bahraich, Uttar Pradesh. The treadle pump is a simple device, which uses human power to lift water from shallow aquifers or surface water, such as lakes or streams, up onto the fields, and is light enough for children to work with comfort and safety.

tation. The major activities promoted by the Government that could substantially assist communities to cope with climatic variability principally relate to (a) rural employment and poverty alleviation schemes (b) watershed development and rain-fed farming systems (c) developing drought proofing measures (d) promoting crop diversification and research (e) promoting farmer credit and insurance and (f) rural health and education.

Some of the major schemes/policies significantly addressing adaptation objectives are as follows:

- **Swarnajayanti Gram Swarozgar Yojana (rural self-employment program)**—This is a major program covering all aspects of self-employment like organizing the rural poor into self-help groups, as well as capacity building, planning of activity clusters, infrastructure development, financial assistance through bank credits and subsidies, and marketing support.
- **Sampoorna Gramin Rozgar Yojana (comprehensive rural employment scheme)**—This program was launched in 2001 with the objective of providing additional non-agriculture based wage employment in rural areas and food security and creating durable community assets. The scheme also includes special safeguards for the weaker sections of society and women.
- **Pradhan Mantri Gram Sadak Yojana (Prime Minister's rural roads program)**—This program was launched in December 2000, with the objective of providing connectivity to all unconnected habitations in rural areas with a





A man walking on the dried up lake-bed in Hyderabad, India

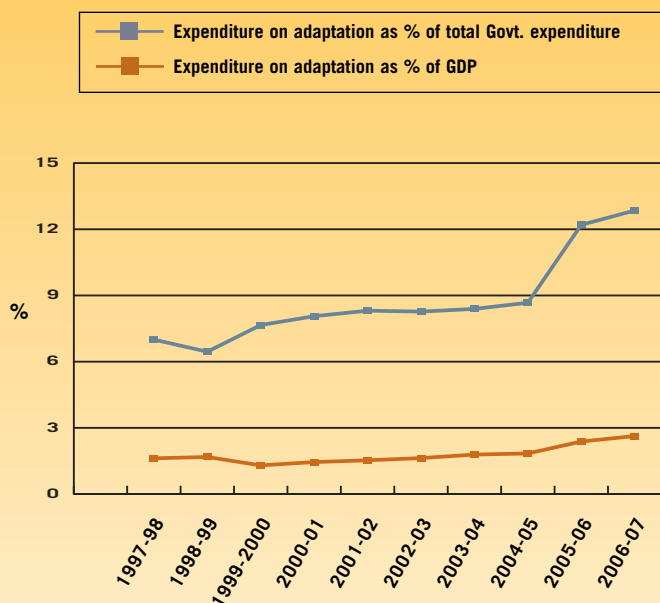
population of more than 500 people through good, all-weather roads.

- **National Rural Health Mission**—The National Rural Health Mission (2005–12) seeks to provide effective healthcare to the rural population throughout the country with special focus on 18 states, which have weak public health indicators and/or weak infrastructure.
- **Accelerated Rural Water Supply Programme**—This is a scheme for providing drinking water for all rural habitations in the country. Rural drinking water is one of the components of Bharat Nirman, which was conceived to build rural infrastructure over four years from 2005–2006 to 2008–2009. The issues of sustainability and quality are being addressed through efforts to promote sustainability and monitor the water quality.
- **Desert Development Programme**—This program aims to control desertification and to conserve, develop and harness land, water and other natural resources for restoration of ecological balance in the long run and also to raise the level of production, income and employment through irrigation, afforestation and dryland farming.
- **Major and Medium Irrigation**—This project is aimed at: development of a water resources information system; hydrology projects; investigation of water resources development schemes; research and development for the water sector; information, education and communication; river basin organizations/authorities; infrastructure development; and dam safety studies and planning.
- **Sustainability of Dryland/Rainfed Farming System**—This system aims to develop dryland farming to increase production and productivity of rainfed areas in the country. Under the scheme, rainwater harvesting, water conservation, efficient use of water, and especially life saving irrigation are emphasized.

- **Disaster Management**—The National Disaster Management policy aims to bring disaster mitigation into the development process. Within this policy, the Disaster Management Act, 2005, was enacted, which provides for the establishment of a National Disaster Management Authority and a National Disaster Response Force for coordinating emergency responses to natural calamities.

In order to get a measure of the adaptation related activities during the last ten years, the Indian Ministry of Environment and Forests of the Indian government has carried out an exercise to compile the yearly expenditure on sectoral schemes identified on the basis of their adaptation relevance (see Figure 1). The adaptation relevance of the schemes, in turn, are determined by a baseline categorization of critical adaptation objectives/components, namely (a) crop improvement and research (b) poverty alleviation and livelihood preser-

FIGURE 1: TOTAL EXPENDITURE ON ADAPTATION SCHEMES



Source: Ministry of Environment & Forests, Government of India

vation (c) drought proofing and flood control (d) risk financing (e) forest conservation (f) health and (g) rural education and infrastructure.

India spent 2.6 percent of its GDP, or 12.8 percent of the total central government expenditure (including transfers), on adaptation relevant schemes in the year 2006-07. India's expenditure on adaptation related programs as a percentage of GDP has increased consistently since 1999-2000 (Figure 1). This can be directly attributed to consistently increased outlays for rural development and crop improvement programs, as well as the launching of new social sector schemes, over the past five years.

Social sector schemes in India are primarily driven by the objective of poverty alleviation and preserving the livelihoods of farmers and other marginalized sections. Many of these schemes have been in operation for nearly 40 years. However, there is scope for including more measures to cover the entire range of impacts of climate variability, and to mainstream adaptation awareness and action in the policy making process. It is essential to screen the relevant policies for reducing risks and enhancing the adaptive capacity of the most vulnerable sections by promoting sustainable development. There is also a clear need to develop strategies ranging from changes in land use and cropping patterns to water conservation, flood warning systems and crop insurance.

However, funding for adaptation initiatives is a major issue, and a consensus is emerging that developed countries should share a fair burden of the adaptation costs that developing countries must bear. Like other developing countries, India has to deal with competing claims on resources; hence, deploying massive fiscal resources purely for adaptation related activities may not be possible in the short term. Already, India spends a reasonable amount on schemes that are directly adaptation oriented. The thrust, henceforth, must be in refocusing/redirecting these programs with new and additional resources so that the adaptation needs of the country are better served.

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