

## MANAGING NATURAL RESOURCES - IDSAsr VERDICT

The scarcity value of natural resources has risen due to rising pressure of human population and demands made by modern economics progress. As such managing these resources has become very important. Bringing out the Indian scenario of natural resources, Dr. K Kasturirangan, Member, Planning Commission, Government of India, an internationally renowned astrophysicist and chairman of Indian Space Research Organization in his Inaugural Address at the two days National Seminar on Management of Natural Resources and Environment in India organized by Guru Arjan Dev Institute of Development Studies, Amritsar highlighted the role of space programme for management of natural resources and environment. Earth observation data through remote sensing will help in achieving sustainable agriculture involving challenges of increasing productivity and reducing environmental degradation. Remote sensing data are already helping in crop acreage and production estimation programme, wasteland mapping, evaluation of irrigation performance and environmental impact assessment of agriculture. He also highlighted the role of ISRO in periodic assessment of natural resources, water security and managing monitoring and mitigating and promoting other community related applications of geospatial technologies and satellite communications. ISRO has proposed five national mission's, - Green India, Sustainable Habitat; Water Mission; Sustainable Agriculture and Strategic Knowledge and work on this will provide useful data base for better understanding of the response and resilience of the ecosystem to climate change

Dr Katar Singh Chairman Indian National Resource Economics and Management Foundation, Anand in his Keynote Address identified the root causes of the problem of degradation of global common pool resources (GCPRs) including space, climate, bio-diversity, ecosystem, high seas and marine resources. He stated that the main challenge is to reverse the process of degradation and depletion and avoid the tragedy of the commons. He proposed a pragmatic management strategy comprising set of market-based and institution-based instruments involving global monetary and fiscal policies, international treaties, conventions and institutions, safe minimum standards, and education and persuasion.

Prof Rampartap Singh, former Vice Chancellor Maharana Pratap University of Agriculture and Technology Udaipur, in his Presidential Address stated that natural resource management is a complex issue involving ecological cycles, hydrological cycles, climate, animals' plants and geography etc. Therefore, a multipronged strategy involving protection and conservation of agricultural resources, adoption of resource conservation technologies, development of competent human resource for adoption of knowledge based advanced technologies, adoption of new ethics of conserving nature and its integrity, rain water harvesting, reclamation of degraded land and shift from resource based to knowledge based technologies etc be adopted. Mr S C Kaushaik, Chief General Manager NABARD in his address brought out the various programme and polices of NABARD in managing natural resources. Dr R S Bawa Chairman Advisory Council of the Institute while welcoming the distinguished guests and participants brought out the issues in management of natural resources and environment and highlighted the need for adoption of suitable policies so that we continue enjoying the nature's gifts without infringing the rights of future generation over them.

Dr Gursharan Singh Kainth, the Director of the Institute, introduced the theme of the seminar and stated that degradation of natural resources is a global problem threatening the livelihood of the people and the globe itself. He said that we are living on overdrafts on natural resources which is already threatening ecological balance. He endorsed the need for strengthening the mutually reinforcing three pillars of sustainable development, i.e. economic development, social development and environmental protection at local, national, regional and global levels.

The seminar was jointly sponsored by Department of Bio technology, CSIR, NABARD and Ministry of Earth Science, Government of India. 65 papers were presented during the seminar in four different sessions. The compilation entitled Management of Natural Resources and Environment in India brought out by the Institute

was also released. Following issues and recommendation emerged from the two day deliberations :

- Strategizing for achieving water resource sustainability is a very complex task. Water is a basic human need and its use impacts and is impacted by many sectors. Water is also both an economic and a social good. Water cannot therefore be treated as an isolated sector issue. The fast growing demand for water from different sectors of the economy and society, the low water use efficiency, the rapidly falling ground-water tables, the increasing pollution of surface and groundwater bodies, uncertainty in resource availability exacerbated by increased variability in weather and changing climatic patterns, the access to water and rising social conflicts in sharing of water resources, unclear and undefined water rights, lack of appropriate institutions and policies etc have brought water sustainability to the core of debate on sustainable development. While the concern over sustainable development, management and use of water resources is being increasingly emphasized, the means to achieving this goal are still hazy or unclear. It was recommended that appropriate institutional policies be framed after collecting data on water availability and level of pollution.
- Various conceptual frameworks of water governance reforms and the experiences in water governance over the last two decades in the country so far indicate a piece meal and adhoc approach akin to coping strategies rather than aiming at identifying long term solutions to water governance issues. Our focus should be diverted from capture and augmentation of water related services to the redistribution of water and creating institutional arrangement. In the face of growing water scarcity and for promoting more efficient use of available water technological interventions, in the nature of micro irrigation (MI) technologies such as drip and sprinkler, are being emphasized. The reduction in capital cost of the system, provision of technical support for MI operation after installation, relaxation of farm size limitation in providing MI subsidies and single state level agency for implementation of the MI program were the key suggestions in this context.
- In the face of declining groundwater table and increasing demand for surface water from different sectors of the economy, there is need for formation of a national water resource management policy acceptable to different stakeholders as a means for promoting sustainable use of water resources by different sectors of the economy. Besides, administrative measures must give due consideration to the role of prices in ensuring a more equitable and sustainable use of water resources.
- Groundwater is under serious threat in several parts of India. Falling groundwater table poses serious threat to sustainability of water resources. In the face of declining groundwater table, recharge of groundwater is increasingly being advocated. Several methods of groundwater recharge are available - rooftop rainwater harvesting, recharge wells, percolation tanks, injection wells etc.
- Sustainability of water resources requires consideration of not only quantity aspects but also quality issues. There is a risk of fluoride contamination which could lead to health problems like discoloration of teeth and bone damage. A constant vigil is the need of the hour by monitoring groundwater situation so that serious degradation of water resources could be avoided and quality water could be sustained for future generations.
- Watershed Management Programme in Wastelands can contribute to food security and conservation of natural resources in a participatory mode. The initial phase of implementation the project provided substantial economic benefits to the participating members. It was basically the donor agency's involvement which brought people in the watershed together. Once the full implementation phase was over, owners of advantageous lands tried to extract more benefits without bothering for the others. The Village Watershed Committee became non-operational and could not succeed in keeping people from all categories united for the cause of watershed and its long term benefits. As a result the benefits which emanated from watershed development in the initial years vanished. The strengthening of the Village Watershed Committees was recommended.
- Historically, forests in India have been viewed solely with the potential for timber as their main value. Not until the 1980s were the truly valuable 'services' rendered by forests were recognized as important,

though these are still not counted in the national budget. Notwithstanding the figures, the place of forests in the national economy was recognized when the National Commission for Agriculture recommended a shift in forest policy from the one based on direct benefits to that of encompassing the total value of services rendered by the forests. After the new national forest policy announced in 1988, the official emphasis has been shifted to manage the forests for their services besides their potential for production of wood and timber. It is time to manage the nation's forests to address climate change and unlock their potential. Proper management can ensure healthy forests that create carbon offsets besides sustaining the communities dwelling in and around the forests.

- There is need for paradigm shift in integrated management of natural resources through watershed approach, where the management of natural resources is integrated and sustained through their inter-dependence and inter-relatedness leading to improvement of the overall production system monitored jointly by the community and public sector managers.
- Need based cropping system / models in hills of north east India having ability to conserve soil, moisture and nutrients be introduced instead of intensive farming systems or use of high yield varieties? Planting of trees, green hedges, adoption of crop farming models integrating *Leucaena leucocephala*, *Cajanus cajan* (perennial) and non-Nitrogen fixing species *Manihot esculentus* and bamboo based agro-forestry system comprising *Dendrocalamus hamiltonii*, *Dendrocalamus longispathus* and *Bambusa tulda* grown along with soybean have been advocated. It is recommended that research based technologies be incorporated in managing resources of dry or wet forests.
- National Bamboo Mission will promote the growth of the bamboo sector in the country through area based regionally differentiated strategies. Bamboo Plantation activities over five years would generate about 50.4 million man days of work. It is a centrally sponsored scheme commenced in 2006-07 with 100 per cent assistance. For achieving the objectives of the Mission, it is necessary for the States to remove restrictions coming in the way of development of bamboo.
- In view of continued demand for the recreational sites for the tourists even with a higher entry fee (hypothetical market), a portion of consumer surplus could be tapped and converted into revenue from the tourism. The non-users of the forest resources are also willing to pay for conservation activities if the forest resources are preserved for the non economic values of the ecosystem.
- To combat the extreme climatic changes and to make the agriculture sustainable; farmers need to blend the modern as well as the traditional techniques. The farmers also need to be oriented about hybrid seeds which are not harmful to the land and eco-system. The findings of the research carried out by reputed agricultural universities/institutions have to be brought to common farmers for adoption. The most effective way to address climate change is to adopt a sustainable development pathway by shifting to environmentally sustainable technologies and promotion of energy efficiency, renewable energy, forest conservation, water conservation etc. Application of best management practices in agriculture and use of bio-fuels for Green House Gas (GHG) mitigation, improving manure management to increase water retention, reduction or elimination of fallow periods between crops, land use changes to increase soil carbon, etc. are some of the measures for mitigating climate change effects. Development of new breeding line, which is less sensitive to sowing dates and temperature regimes in Rabi season, is the need of the hour.
- A variety of new climatic finance mechanisms using international emissions trading markets are expected to emerge to attract private investments in mitigation activities in developing countries. Carbon markets must be structured by governmental actions to achieve significantly greater emissions reductions, and then it may be produced by an open market, such as the current market for Certified Emission Reduction. Clean Development Mechanism (CDM) should be supported by more ambitious sectoral and policy crediting mechanisms.
- Though for the past two decades we are bearing the wrath of climate change, but still we lack hard core policies to confront its consequences. We have to work with cooperation and have to implement

a common policy in the South Asian region in order to overcome the wrath posed by the climate change. Inter-connectivity of these data systems under an over-arching system for management is largely missing. Developing a statistical system for informed decisions and better policies, which could help taking possible safeguards from catastrophes and develop a system for better mitigation and adaptation techniques, assumes a lot of significance.

- Green buildings save energy by 15 to 30 per cent, materials and conserve quality of environment. It is need of the hour to restructure building in a way to be environmental friendly and increase efficiency of water and electricity consumption, by harvesting water and providing bright light through the placement of windows, doors etc. Emphasis should also be laid on tax benefit for green buildings.
- Disasters occur due to natural and technological mishaps inducing very high vulnerability to land users, farmers, etc. Adverse impacts should be minimized by training and education of the public regarding climate change and specific solutions to prevent these calamities.
- How to educate people for conservation of environment and adopt new agriculture? Modern agriculture such as organic farming and good technical skills given to younger people would help sustainable development. Organic farming with minimal use of pesticides lead to optimal profits to farmers and this is the need of the hour. Here comes the role of New Biotechnology Tools for optimal profits in food production processes.
- Academic institutions and NGOs along with Government organizations may play a major role in reaching out to the masses for measures to mitigate impact of climate change by awareness generation and educational programs at community level, different sectors in mitigation measures and steps/mechanism developed and put in practice to reduce emissions. Education system needs drastic changes to meet challenges of sustainability and can be achieved by better communication among all stakeholders, public participation and opinion polls involving all sections of society. Also we need a National Forum for suggesting optimum solutions for specific needs of persons/groups and for government policies.
- Information and Communication Technologies (ICTs) can be part of the solutions to climate change. No doubt, increased use of ICT is part of the cause of global warming (millions of computers and billions of television sets that are never fully turned off at nights at homes and offices). However, ICT can also be a key part of the solution by focusing on efforts on more standardized power supplies and batteries, smart devices, research and development on consumption & power supplies, and economy wide emissions reductions by offering smart energy solutions. A clear message on the role of ICT in climate change is urgently required and this message needs to be delivered outside the ICT sector.
- Development without environmental protection is harmful. Sustainable development should include materials, minerals, energy, water, soil and land surface, biologic resources. Environmental management should involve prevention rather than control; it should involve not only conservation, climate change and productivity but also spirituality. Optimal mix of environment protection of natural resources and of energy use is most desired ingredient of sustainability.