

Water Sector Options for India in a Changing Climate (www.sandrp.in, March 2012)

EXECUTIVE SUMMARY

This report tries to capture the relevant issues for Indian Water Sector in the context of changing climate. The report briefly reviews international situation in the context of the four pillars of climate change response that are used in international climate change framework: Adaptation, Mitigation, Technology and Economic/financial issues. It takes a look at the official programmes and projects of governments in water sector. It includes some local options and success stories in water and agriculture in India in the context of changing climate.

Major relevant sectors here include agriculture, urban and rural water users, industrial water users and usually the last mentioned, if at all, the environment or nature. Stock taking needs to involve rainfall and snowfall, surface water and ground water, existing water infrastructure and how all this will be affected due to climate change.

The report focuses on:

- Analysis of the state of water sector in India: Trying to understand the blessings, resources and their state in India's water sector, how the different sections of people are getting their water and how just, equitable and sustainable these systems are.
- What have been the dominant plans, programmes and policies driving this sector?
- Challenges facing the dominant global and business as usual national development paradigm.
- Need for taking the issues to the grassroots, including raising awareness and spread good examples of resilience (adaptation) to climate change within local communities.
- Need for including traditional knowledge, traditional techniques, crops (e.g. millets) where appropriate
- The need for options assessment studies in order to respond to big infrastructure plans.

The documentation of case studies is in the context of climate change adaptation and ecological resilience. The report tries to highlight the potential of options in scaling up and providing solutions to climate adaptation, sustainable and democratic water management, biodiversity conservation and poverty alleviation.

Rainfall It is clear that rainfall pattern in India is changing significantly and a major reason for the changing pattern is climate change. The frequency and magnitude of high rainfall events is increasing. Number of rainy days is decreasing. This indicates increased frequency and severity of floods. The onset of monsoon and the gap between rainfall events is becoming irregular.

This is having huge impacts for all farmers, but particularly for the rainfed farmers. By way of adaptation strategies in this situation, we need to make local rainwater harvesting and ground water recharge central and top priority in our water resources policy, programmes and practices. Secondly, we need to incentivise changes in our cropping patterns, cropping methods (e.g. system of rice intensification and system of crop intensification), seeds and other agriculture practices that have better coping capacity. SRI crops help farmers to cope with the longer dry or wet spells that are likely in climate change scenario. Thirdly, we need to make our forecasting of rains more accurate and make this key information available to farmers, decision makers and people. Fourthly, we need to incentivise practices that can lead to increase in carbon content in the soils. This will ensure that soils are able to retain moisture for longer periods, so that when there is longer gap between two rain events, the crops have greater chance of survival. We also need to review our reservoir operations to make them climate friendly and also make them more transparent, accountable and participatory to

reduce the flood disaster potential in the changing climate. Lastly, governments and the world need to put in place a much more credible system of compensating the farmers who suffer the impacts of climate change and in whose creation they have made the least contribution.

Glaciers Himalayan glaciers are already melting, the extent is different. We still do not have clear picture of the extent of loss in area and volume in different areas, but the research provides some indicators of how the different basins are going to be affected. However, there are still a lot of variables and unknowns and even available information is not all in public domain. Our knowledge base is poor. We still do not know the full extent of volumes of snow in different forms in the Himalayas in different regions and how each of these are changing and what impact we may have in future. It is estimated that glaciers may disappear by the end of the current century in most places, but rainfall would have increased by then. The summer flows would thus reduce significantly nearer to the glacier and snow bound zones, but monsoon flows may increase, depending on how we treat the Himalayan catchments. It is true that this would mean some reduction of storage space that nature has provided in these areas, but the extent is a big unknown.

The answer is not in building big storage dams to compensate these losses. That would be like cutting the nose to spite the face. Building such projects would actually increase the problems as such projects destroy the forests, rivers, biodiversity and also emit methane in tropical and sub tropical climates. Destruction of all these resources would reduce the adaptation capacity of the communities near the glaciers and society in general.

Better option would be to learn lessons from what is being done by Chewang Norphel and others in Ladakh: Create small localized storages that will serve the local communities and that can also be maintained by them. Potential of such options needs to be assessed and realised across the region. And protect forests, rivers and biodiversity on priority. Most importantly, take urgent steps to slow and stop the global warming trend through credible mitigation measures. Exercising right to pollute as the developing country governments are doing would be more like what Gandhi said: An eye for eye would make everyone blind. Instead, pressure needs to be brought on the developed countries to bring down their emissions urgently by amounts necessary to stop global temperature to go beyond 1.5 degrees C. And in the meantime, we are killing the goose by building large number of hydro projects in these same vulnerable areas, destroying the forests, rivers, biodiversity, and in general destroying coping capacities. We should stop doing that.

Groundwater Groundwater is India's current water lifeline and is likely to remain for many coming years. In the context of climate change, groundwater demand, use and recharge will all be affected, leading to further depletion of groundwater levels. This will affect water, food and energy security. Urgent action is required to protect existing groundwater recharge systems, to create more groundwater recharge systems (which can basically be achieved by harvesting rainwater where it falls in the first place), to reduce groundwater use by adopting appropriate cropping patterns, cropping methods, use pattern (through proper policies that allow only appropriate water use activities, depending on water availability) and most importantly, bottom up regulatory system. Groundwater conservation is particularly critical in climate change context as groundwater can be helpful in adapting to climate change.

Rivers, Floodplains, Wetlands and water bodies Rivers, protected floodplains, wetlands and water bodies can help the vulnerable communities and environment to cope with the climate change in many different ways. The services these resources provide are huge, though not recognised by the decision makers or properly accounted for. The Groundwater recharge that they facilitate is particularly important in India where groundwater is country's water lifeline. They are huge assets in the climate change context and all efforts needs to be made to protect them. Environment flows are relevant and need urgent attention even from existing dams in this context. We are doing very little today, and if we do not make sincere and urgent efforts in this direction, our capacity and particularly that of the vulnerable sections of the society to adopt to the climate change would significantly reduce.

Big Projects Large hydro projects and reservoirs are being sold by some as climate solutions. However, this seems like misguided advocacy, used by the vested interest lobby. Unless and until it is creditably established that the potential benefits from existing large dams have been exhausted and that all local and underground storage options (including the option of increasing the capacity of the soil to hold moisture through increased carbon content in the soils through greater use of organic fertilisers) have been exhausted, there should be no question of any new project being considered. Even operation of existing projects and size of the under construction project may be reviewed to make them more compatible in the climate change context. There is a huge untapped potential in all these options and this is available without any extra costs in terms of social or environmental impacts and much lower economic costs compared to new projects.

Agriculture It is high time we do course correction to bring focus of our water and agriculture policies onto Rainfed Farming. It is likely to yield better economic, hydrologic, sustainable, equitable and climate friendly results and foodgrains production. It can also help sustain our groundwater lifeline. Organic agriculture, cropping methods like the System of Rice Intensification, System of Wheat Intensification, System of Crop Intensification, Sustainable Sugar Initiative, etc contribute less to climate change in every way and importantly for a country like India, generates more employment, conserve water and increase production. These options also help on both adaptation and mitigation front. However, there are no policy or financial incentives for these, nor are these initiatives part of NAPCC or National Mission for Sustainable Agriculture. We need to change this urgently. Devising ways of providing carbon credits for these initiatives is also needed. Using the vast grazing lands in India to take up the chauka system development pioneered by Laxman Singh and his team in Latoria and surrounding villages in Jaipur district in Rajasthan would go a long way. We also need to start understanding the implications of virtual water concept and disincentivise export of water from water scarce areas and nations through export of water intensive products like sugar and rice. It is clear there is a huge potential, if we are seriously interested.

Positive cases of Local Adaptation The message seems simple enough: where possible, revive old ponds, build new ones and allow and help the villagers to manage it on their own. Create such systems where they do not exist and where possible. The schemes under the Mahatma Gandhi National Rural Employment Guarantee Act can be used for this, but would succeed only when credible social audit mechanism is in place.

Urban Water Sector Urban centers first need to exhaust the options of reducing huge transmission and distribution losses (most cities have more than 45% losses on this account), rainwater harvesting, groundwater recharge, protection of existing local water bodies, relocation of non essential water intensive activities (e.g. soft drinks or water bottling plants), banning water wasteful activities in deficit areas (activities like golf courses), treatment and recycle of wastewater, demand side management and participatory & democratic governance.

Decentralized wastewater treatment facilities should be the norm. The decentralized systems would also be less energy intensive, less cost intensive, more efficient and is actually likely to lead to more recycling of the treated water. If bottom up participatory governance is put in place, all these objectives would be easier to achieve. Without achieving these objectives, the urban centres should not be allowed to be given any water from outside the areas. Legal action in any case should follow when a city is unable to treat the wastewater it generates as also if other norms are violated. There could be incentives when each of these norms is achieved and disincentives when they are not.

Un-clean Development Mechanism Clean Development Mechanism projects, administered by the United National Framework Convention on Climate Change, are supposed to help developed countries in achieving their emission reduction targets by helping developing countries achieve emission reduction and getting credit for the same by funding projects in these countries. The fundamental problem with this mechanism is its market driven nature in which the local communities have absolutely no role to play, receive no benefits from the projects or credits while receiving full blown impacts. They are also not sustainable

development projects in almost 99% of cases. 32% of the projects registered with UNFCCC's CDM Executive Board come from India. Unfortunately, the government only sees them as free gifts and is not bothered if the projects indeed qualify to be CDM projects from climate point of view, from environment impacts point of view, from social impacts point of view, from technology transfer point of view or from equity point of view. There is an urgent need to address the unhealthy nexus between project proponents, funding agencies like World Bank which promotes these projects for carbon credits, developed country agencies like the Swedish Energy Agency and the UNFCCC which ignores valid and serious concerns raised by communities and local organisations.

CASE STUDIES In the case study on Forests and Agricultural plantations, Dr. Latha Anatha and S. Unnikrishnan observe that yields of tea, coffee and cardamom from high altitude plantations in ecologically rich Western Ghats have been falling in the recent years and planters and farmers are linking this to the changing regional climate; increasing drought, lowering soil and atmospheric moisture, degradation of the surrounding forests, changing rainfall pattern and intensity, drying up of forest streams after the rains and drier soils. A study in Karapparra catchment in Chalakudy basin indicates that these impacts have resulted in severely reduced production. In the last 15 years major companies have indicated that coffee yield has declined from 400 kg/ acre to 140 kg/acre. The authors provide some useful recommendations and adaptation strategies that can help sustain production, while reducing the impacts.

Shripad Dharmadhikary points out in his case study that organic farming offers very important advantages to India not only from the point of view of food and water security but it terms of emission reductions too. It helps in making one of the most vulnerable sectors resilient and offers protection from increased variability. However, in order to provide a level playing field to organic farming and promoting it, measures like creating awareness, providing knowledge, information and guidelines to farmers to prepare their own inputs and for other techniques of organic farming, and to provide market support will be needed. All of these will require significant support from the Government, including financial support. Organic Farming is arguably one of the best climate adaptation options with multiple benefits on social, environmental and economic fronts.

Recommendations Climate change offers a unique opportunity to revisit our water resources in terms of understanding, planning and management. It also provides an opportunity to learn lessons from past approaches to development and management in a credible way. The purpose for a revamped water policy, plans and practices in changing climate could be that of equitable, sustainable, participatory, decentralised, democratic and transparent approach to water management; an approach based on sound knowledge and data to make decisions. Further, this approach would need to include a protection strategy for the rivers, forests, wetlands, water bodies, biodiversity, critical ecological habitats and groundwater reserves, as well as demand side management measures, along with a definition of the clear linkages between these domains. In Water scarce situations, all demands cannot be sacrosanct, and we also need to prioritise the just use of water. The final chapter gives a list of recommendations in this context.

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