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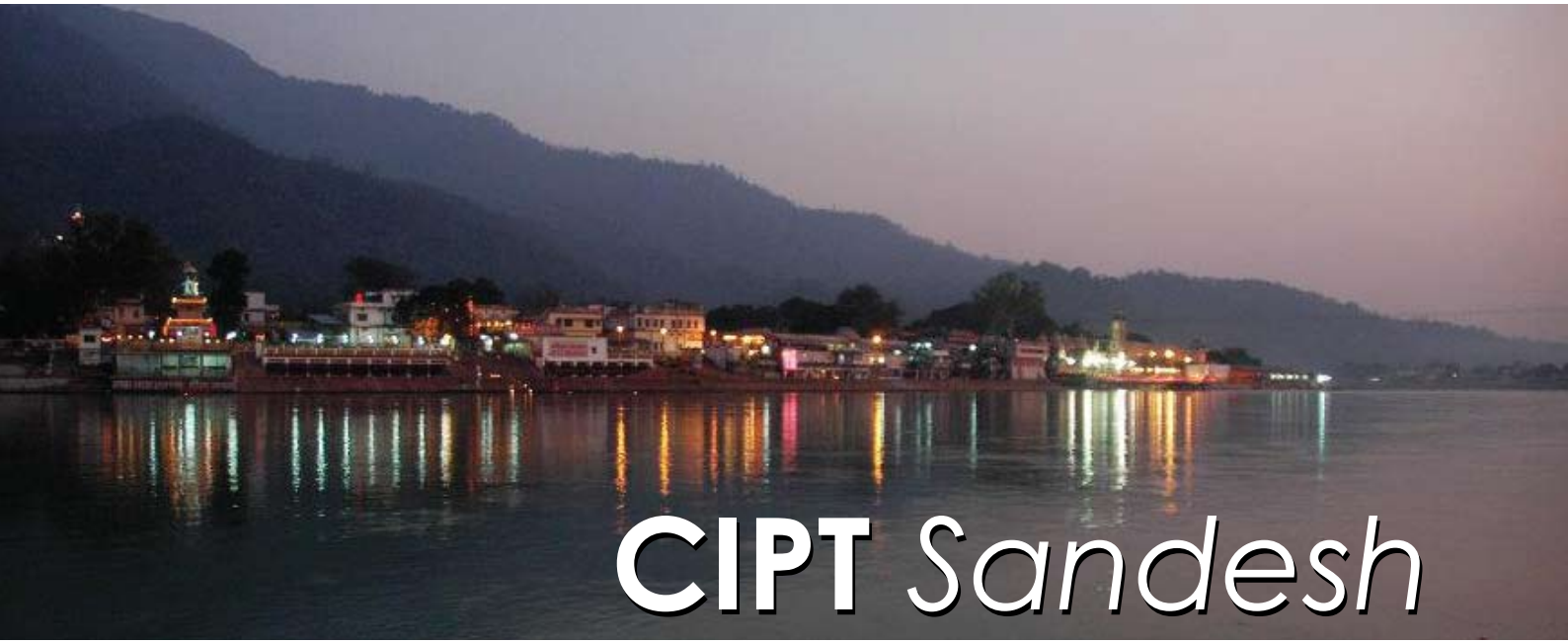


CIPT Sandesh

Issue 4 December 2014

In this issue...

Editorial

Dear Friends,

The release of the fourth issue of CIPT Sandesh marks the successful culmination of the first year of our quarterly newsletter. Across the past three issues, we have made an attempt to bring out case studies from our work and topics of interest in the sector. The newsletter has been the mouth piece of our work. We thank our readers for their feedback and suggestions which have helped us improve the content of our newsletter.

Water as a resource is under stress. Rising population, growing pollution, significant changes in climatic patterns are adversely affecting the use and availability of water across the world with India being no exception. The country is staring at a real water crisis. Numerous debates, discussions and policy discourses reinforce the crisis and call for efficient management of water resources. It is often argued that legal provisions on water need to be reformed and strengthened. States across India have enacted Acts which have been instrumental in bringing about reforms in the water sector. Water is listed as a state subject under the provisions of the Indian Constitution. Thus, states have greater say and control in framing legislations with the central government proving broad policy directions.

The current issue of CIPT Sandesh includes an analysis of some of the major legislative reforms undertaken in the past few years. We have tried to analyse the Punjab Preservation of Sub Soil Act, 2009 and Gujarat Irrigation and Drainage Act, 2013 with an assessment of the provisions and its possible consequences and impacts. We have also outlined the main provisions of the proposed National Water Framework Law with a note on its merits.

As is often said in respect of environmental legislation in India – 'enforcement is a problem'. The problem will not only be overcome by efforts of the public institutions, it is where the civil society and community, in fact every user of water has to play a role in. The biggest change can begin with us!

We hope you find the content of the newsletter useful and look forward to your comments and suggestions.

We convey our wishes for a Happy New Year!

Kamal Vatta and Romit Sen
Editorial Team

Where there is a will, there is a way: Water management in agriculture

Prof (Dr) Ashok A Patel, Vice Chancellor
Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar, Dantiwada, Gujarat

Water is essential for life, but has been taken for granted ever since civilization developed on riparian swathes. Despite 3/4th of the globe awash with water, only 2.5 per cent of water is fresh. Out of this only 0.5 per cent is available for different uses. This gave a good reason for our ancestors to worship freshwater resources. Without water no state can flourish; no life including crops can survive; even a single drop is too precious to be wasted. The myth that water is an infinite resource with free-for-all mentality is prevalent till now. Consequent upon population surge, the demand for freshwater has been swelling all along. So where is all that extra water coming from? More and more water is being pumped out of aquifers. In this fight for water, agriculture is both a cause and a victim of water scarcity.

Ground realities

Agriculture sector accounts for nearly 80 per cent of water use and at least half of the irrigation water used is groundwater. Even modest gains in agricultural efficiency will result in tremendous volumes of groundwater savings. Gujarat has employed a three-pronged strategy comprising physical, infrastructural and management aspects for storage, distribution and utilization of water.

North Gujarat represents arid and semi-arid agricultural growing seasons characterized by dry and warm situations leading to heavy evapo-transpiration. The soils are sandy with high percolation rate of more than 15 cm/hour. Climate change has exacerbated the situation by over-whelming peaks in rainfall in lesser number of days. This has prompted instant run-off, thereby reducing the availability of freshwater. The monsoon is uni-modal (350 – 700 mm), mainly falling during two months of July and August. The least growth period that signifies the period where supply of water i.e. rainfall exceeds demand of crops is less than 90 days.

The agriculture system is animal husbandry based and is highly diversified. It predominantly grows non-cereal crops amenable to value addition like castor, seed spices, cotton, groundnut, pulses, potato, tomato, lady's finger and fruit crops like pomegranate, papaya, lemon etc. Animal husbandry is well developed and dairies like Banas, Sabar etc. have made their presence felt world over. These overwhelming achievements in the agricultural sector are primarily attributed to good governance, entrepreneurial society, infrastructural advancements, innovative technologies and backward and forward linkages of agriculture sector. The agriculture sector in North Gujarat has exhibited double digit growth rate for the last decade compared to national agricultural growth of around 3 per cent. Despite the fact that the agriculture sector accounts for just 14 per cent of the state GDP, it engages over 65 per cent labour force, suggesting enormous room for improvement.

Going by the inventory of the crops grown in North Gujarat, these are very water intensive. One-third of the cost of cultivation is incurred on drafting water from deeper aquifers. It takes around

100 and 150 litre of water to produce one kilogram of wheat and castor, respectively. The water consumption for producing a piece of tomato comes around 13 litres; while for potato it is 25 litres. The daily drinking water requirement per person is 2-4 litres, but it takes 2,000 to 5,000 litres of water to produce one person's daily food.

Reforms in the sector

Water, energy, agriculture and livelihood security are inextricably linked. Consequent upon electricity subsidies to farmers in 1970s, the farmers of North Gujarat started exploiting groundwater from ever-increasing depths. There were no water conservation techniques in place. The over-withdrawal of water culminated in fast depletion of aquifers. However, a simple management decision to do away with electricity subsidies and charge electricity bills on the basis of actual metered consumption of power did the trick. This was done by introducing 'intelligent rationing' of farm power supply through dedicated separate power cables for agriculture sector. This ensured high-quality power supply for a set number of hours each day at a price they could afford.

The aquifers were experiencing rapid rates of depletion because of over-exploitation of water for agricultural purposes. The first step to manage the groundwater problem was to encourage water harvesting by constructing and deepening farm ponds, constructing check bunds and bori bunds etc. The development of surface water reservoirs led to remarkable achievements in water harvesting, storage and mobilization. The second ambitious step was execution of Narmada Canal Project that linked it with drying out different dead rivers. For judicious use of water and to avoid downsides, irrigation water is planned to be regulated through Farmers' Management Societies. The project also took care of scale of re-use and re-cycling of drainage from Narmada Dam through earthen bank Sujjalam Sufflam Canal. This not only redirected the water for reuse but was helpful in recharging the starved aquifer. The net result was evident; the water table rose, the aquifer got recharged and the non-functional tube wells became functional.

The third game changer was the establishment of a public company for executing micro-irrigation at farmers' field. The sprinkler irrigation could save thirty-odd per cent of water in field, vegetable and horticultural crops. Drip irrigation not only saved water but made the application of nutrients more precise. At present, large areas across Banaskantha, Sabarkantha, Patan, Gandhinagar and Kutch districts are on micro-irrigation mode. The amount of output per unit volume of water can be raised either by increasing production from a given amount of water and/or by reducing the use of water for acceptable levels of production. Some varieties like GW 11 in wheat have been released that give reasonable yield under limited irrigations. This is very important in situations where adequate water is not available. This example is just an indicator of the other technologies developed in the state.

Further gains in water-use efficiency are being targeted through plant breeding and biotechnological tools. Good biomass, vigorous early growth for fast ground cover, root development and reduced susceptibility to drought are some of the most soughtafter characters. The judicious use of water is also being investigated through microbes and precision based experiments. The narration simply suggests that management of water can be done on sound planning like river linking, recharge of aquifers and by judicious use of water. What is needed is to work out a plan and plan out work accordingly to save water for our future generations.

The Punjab Preservation of Sub Soil Water Act, 2009: Successful policy intervention for preserving groundwater resources

Kamal Vatta

The negative effects of intensive agriculture in Punjab, especially groundwater depletion, started becoming visible way back in 1980s. The water table started falling at the annual rate of 18 cm during 1982-87. Despite some concerns being raised by academicians at that time and Johl Committee recommending shifts in the cropping pattern towards high value and less water consuming crops in 1980s, no major effort was undertaken to address the emerging issue of groundwater depletion. The result was that annual rate of depletion increased to 25 cm during 1990-2000 and touched alarmingly high levels of 91 cm per annum during 2000-2005. The dominance of rice-wheat monoculture was being cited as the major reason for such crisis and Johl Committee and Kalkat Committee once again pointed towards the need for crop diversification in 2002 and 2006, respectively.

There was another factor feeding into the severity of groundwater depletion. This was the practice of early transplantation of rice. The proportion of rice area being transplanted even before the start of June was reaching more than one-third and that before mid-June was touching almost two-third. As water requirements of the early transplanted rice were much higher due to high temperature, low humidity and rainfall, it was leading to faster depletion of the aquifers. The fact was well documented and highlighted by the eminent scholars, scientists and development administrators. Despite the concern and appeals to the farming community for avoiding early transplantation of rice, there was no breakthrough in getting the things corrected. The fear of losing votes of the farming community was preventing the government from taking any hard step to discourage the practice of early transplantation of rice.

Making a start

After continuous efforts of the Punjab State Farmers' Commission, Punjab Agricultural University and the Department of Agriculture, the Punjab Government was encouraged to promulgate an ordinance in May 2008, which was later changed to an Act in March 2009. The Act prohibited the farmers to sow rice nursery before 10th of May of every year and to transplant rice before the notified date (which was 10th June). There was a provision of destroying the nursery or transplanted rice in case of violations and recovering the costs from the non-complying farmers. The Act provided for penalty from the farmer upto Rs. 10,000 per hectare, in case of him not acting as per the directions of the authorized officer.

Despite the challenges of implementing the provisions of the ordinance (and later the Act) and the fears of a backlash from the farming community, pro-active approach of the government and careful planning and its implementation by the bureaucrats and development officials made the Act a success story in Punjab. The proportion of farmers transplanting rice before the start of June declined sharply to less than 2 per cent and those transplanting before mid-June also came down to less than one-fourth in 2008-09. The proportion has become almost negligible in the later years highlighting the success of implementation of the Act.

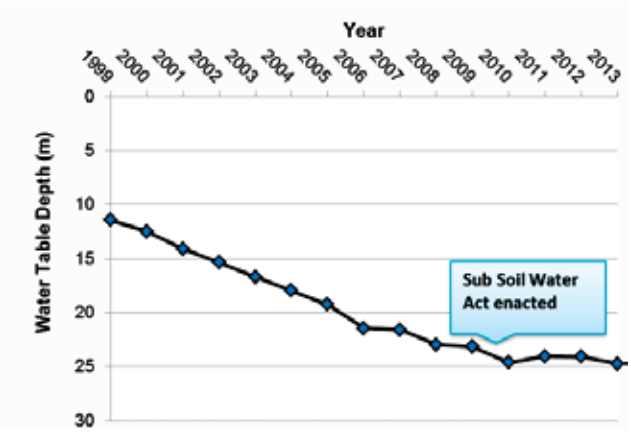
Small yet significant steps

Apart from implementation of the Act, its positive impact on checking the rate of groundwater depletion, reducing power consumption in agriculture, power subsidy and decline in relative humidity are worth mentioning. A study by Prof. Karam Singh, Consultant, Punjab State Farmers Commission in 2009 revealed that the Act could check the annual fall in water table by 30 cm. Reduction in water use due to the prohibition of early transplantation led to the electricity consumption of about 27.6 crore units, which translated into an annual reduction in power subsidy bill of the Punjab government by Rs. 122 crore. Even the relative humidity due to decline in the evaporation of flooded water was estimated to have declined by about 15-16 per cent, with a potential to bring significant reduction in the incidences of insect-pests and diseases.

Looking at the rate of fall in the water table in central Punjab in the recent years, it is evident that depletion of groundwater resources has slowed down by some fraction, though it still continues to be significant (see Figure 1). It is due to the fact that the cropping system in Punjab is dominated by paddy-wheat rotation with an annual demand of more than 2 meters of irrigation water against the long-term annual rainfall of the region at around 60-70 cm.

Such a mismatch between demand and supply of irrigation water in Punjab will lead to a continuous decline in the water table with severe implications for power consumption in agriculture, power subsidy, fixed investments by the farmers in irrigation infrastructure, farm incomes and sustainability of natural resource use. There is an urgent need to look at all the possible options for sustainability of natural resources in agriculture, especially groundwater. While a single solution will not address the problem completely, there is a need to look at the water-energy-agriculture nexus in a holistic manner.

Figure 1: Water table depth in Central Punjab



Source: Department of Soil and Water Engineering, Punjab Agricultural University

The success of the Act has given an important message to the policy makers, administrators, scientific community and development officials. It reflects that issues of common property resources can be effectively addressed by operational policy instruments without any adverse political fall outs. There is need to encourage the use of water saving technologies and practices; shifting towards less water intensive crops and improve the overall water-use efficiency in Punjab agriculture.

We should explore more policy options which can facilitate rational use of water in agriculture as well as in industry. It is important to note that sub-optimal policy instruments not only promote wasteful use of precious natural resources but also cause significant reduction in the impact of resource saving technologies and practices.

The role of policy instruments for bringing synergies between agricultural production and natural resource should not be ignored and in fact should be explored more enthusiastically.

Kamal Vatta is Director at Centers for International Projects Trust

Gujarat Irrigation and Drainage Act: Moving towards regulating groundwater use

Nikunj Parekh

Water laws in India have been continuously evolving. Our country lacks an umbrella framework to regulate freshwater across all its dimensions and uses. The existing water law framework in India include common law principles and irrigation acts from the colonial period as well as more recent regulation of water quality and the judicial recognition of a human right to water. In terms of statutory development, irrigation laws constitute historically the most developed part of water laws.

In Gujarat, the stage of groundwater development is 70 per cent. As per the Central Ground Water Board (CGWB) reports, of the total 223 assessed units in Gujarat 31 are already over exploited, 12 are critical and 69 are classified in semi-critical stage. This indicates an alarming situation for the state as close to 80 per cent of the irrigated area uses groundwater for irrigation.

The Government of Gujarat passed the Gujarat Irrigation and Drainage Act in 2013 replacing age-old Gujarat Irrigation Act 1879. The main objective of the new Act was to increase the performance efficiency of irrigation schemes in the state with a view to bring about equitable distribution of water for irrigation with the help of farmers and maximizing benefits from irrigation through canals in terms of agricultural production without additional cost.

Salient features

1. *Construction and maintenance of canal systems* – Under the Act, the state government may, by notification in the Official Gazette, declare that water of any river or stream flowing in a natural channel, or of any lake or any other natural collection of still water, should be applied or used by the state government whenever necessary.
2. *Canal crossings* – The canal crossings shall be provided at places where the government thinks necessary for the reasonable convenience of the inhabitants of the adjacent land, and suitable bridges, culverts or other works shall be constructed to prevent the drainage of the adjacent land obstructed by any canal.
3. *Removal of obstructions to drainage* – The state government may, by notification in the Official Gazette, prohibit formation of obstructions across any river, stream or natural drainage course, within certain limits when it appears to the state government that the obstruction of the rivers etc. can cause any injury to the public health.
4. *Construction and maintenance of field channels* – In public interest, the state government may construct a field channel at its cost.
5. *Supply of water* – Every person desiring to have a supply of water from a canal shall submit a written application to the canal officer along with a fee as may be prescribed by the state government. On receipt of application, the canal officer may grant permission for water supply with conditions and restrictions. The canal water supplied for irrigating one or more crops shall be valid only for such crop or crops till their maturity.
6. *Water rates* – The state government may determine the rates to be levied for canal water to be supplied for irrigation and other purposes.
7. *Offences and penalties* – The Act proposes penal action including imprisonment and fine or both on those who voluntarily or without any authority cause damage to the canal.

8. Special provisions regulating construction and maintenance of tubewells, artesian wells and borewells -

   a) The Act proposes that a landholder will need a license from the canal officer to construct any tubewell or artesian well or borewell, beyond the depth prescribed for extracting groundwater.

   b) Where any tubewell, artesian well or borewell is in existence in an agricultural land at the commencement of this Act and the depth of such well is in excess of the depth as prescribed, then the holder of the agricultural land shall, within three months from commencement, have to furnish information in respect of the well to the canal officer of jurisdiction.

      The canal officer, if satisfied that the well was in existence at such commencement, will grant a certificate to the holder of land certifying the said well was in existence at such commencement.

   c) If the holder of a license has, without reasonable cause, failed to comply with the terms and conditions subject to which the license has been granted, by fraud or misinterpretation, the canal officer may after giving the holder of the license an opportunity of showing cause, by order cancel the license.

   d) According to the Act, farmers not following the actions prescribed above may face imprisonment for a term which may extend to six months or with fine which may extend to ten thousand rupees or with both.

It proposes to achieve the above objectives through optimal water use, metered water supply, volumetric pricing and participation of farmers for effective management of water resources.

As part of an alternate approach to governing groundwater, the Gujarat Government formed a Gujarat Water Regulatory Authority (GWRA) in 2012 to streamline water usage and work according to the state water policy. The key objectives of GWRA entail regulating over-extraction of water resources and ensuring judicious use of both surface and groundwater.

Enforcement challenge

Provisions of the Gujarat Irrigation and Drainage Act, 2013 restrict farmers from drawing groundwater, however there is no such provision to regulate the groundwater use for other purposes such as industries, utilities etc. A fair argument would be to regulate other users as well in order to manage the over-exploitation of groundwater resource

The real challenge lies in the transaction cost of enforcing such a law across millions of scattered borehole owners in the state. The government needs to invest resources in research and extension to train farmers on efficient use of groundwater resources. In addition, water-use efficency in agriculture can be enhanced by promoting low-cost water saving technologies, practices and less water intensive crops.

Nikunj Parekh is Project Coordinator at Centers for International Projects Trust

National Water Regulatory Framework: Finding a common ground for implementation

Pritha Bhattacharya

The Ministry of Water Resources, Government of India unveiled a new National Water Policy (NWP) in 2012. With the threats on water resources increasing due to rise in population, competition across sectors, impacts of climate change, the launch of a revised water policy was considered well timed. The policy has been appreciated on grounds of incorporating adaptation strategies for climate change, evolving benchmarks for water use across different sectors, incentivizing recycling and reuse of water. In addition, it also recognises the need of a common integrated perspective which should govern the planning and management of water resources.

To carry forward this idea, the NWP seeks to formulate a National Water Regulatory Framework Law, which will manage water resources as a common pool community resource. The law recognizes that water as a subject, comes under the purview of the state governments and gives them the right to make laws based on state priorities. However, the law also recognises the need for evolving common denominators of water governance rising above the political, ideological and regional differences found within the country. It means that the National Water Regulatory Framework would provide a set of fundamental principles guiding water governance in India.

Enlisted provisions

The Framework Bill which is also called the Alagh draft contains 8 chapters. The first chapter contains short title, extent, commencement and definitions. The second chapter deals with basic principles of water management. These principles are considered fundamental to a system of water governance which ensures prudent, wise, equitable, socially just, conflict free, efficient and sustainable management of water. These principles have been enshrined in the Act keeping with the spirit of the National Water Policy, 2012. The third chapter highlights the right to water as the right to life, by ensuring that every individual has access to a minimum quantity of portable water within easy reach of the household. Preserving water quality of various water sources and seeking equitable pricing of water by establishing the institutional mechanism of a Water Regulatory Authority in every state has been also emphasized in this chapter.

Provisions outlined in the fourth chapter call for a comprehensive Master Plan for inter-state and intra-state river basins/sub-basins, as NWP-2012 indicates that water resource projects are being planned and implemented in a fragmented manner without giving due consideration to optimum utilization, environmental sustainability and holistic benefits to people. The framework insists on taking basin as the unit of planning and applying the principles of integrated water resources management. This chapter deals with a wide range of topics ranging from data management to pricing of water. It recommends maintenance of a comprehensive water resources information system (India WRIS) on a GIS platform. A National Water Informatics Centre shall be established to regularly collect, collate and process hydrological data, conduct the preliminary processing, and maintain it in the India WRIS. The Bill also seeks to mitigate water related disasters like floods and droughts through structural

and non-structural measures including coping mechanisms. The need for aligning project planning and management to the regional agro-climatic considerations has been emphasized while taking into account possible future scenario, including climate change, after maximising water-use efficiency and benefits from the locally available water resources. The empowerment of local governing bodies like Panchayats, Municipalities, Corporations and giving due consideration to specific needs of Scheduled Castes and Scheduled Tribes, women and other weaker sections of the society.

The Bill fouceses on the regulation of groundwater through community participation, preservation of recharge zones and prevention of pollution. It recognizes that groundwater plays a crucial role in providing irrigation and drinking water but its regulation has not been given adequate attention across different parts of the country. Need for urban and industrial water management has been brought to the foreground in this Bill. In respect of urban water management, the provisions call for 100 per cent metering and pricing on volumetric basis. Apart from improving water-use efficiency and recycling of water, the Bill states that the state governments and urban local bodies may associate with the private sector in public-private-partnership (PPP) mode for urban water supply and sewage treatment with the provisions of penalty on the private parties for failure in services with the state having regulatory control on prices charged and service standards.

To manage industrial water, pricing of water, incentivizing recovery of water and filing of water audits for water intensive industries have been suggested. The chapter ends by emphasizing for participatory water management through Water Users Association (WUAs). Chapter V of the Bill recognizes the need for the development and promotion of indigenous knowledge and technologies for conservation of water. Encouraging research and promoting academic inputs in the management of water resources is the main highlight of this chapter. Integration of all schemes relating to water and convergence of schemes has been emphasized in Chapter VI. Chapter VII provides for setting up of a High Powered Committee for coordination and policy support mechanism for various agencies at the centre and in states that deal with water. The last chapter deals with miscellaneous issues such as enforcement of the provisions, framing and laying of the rules, etc. With regard to enforcement of the Bill, it indicates that states shall, where appropriate, enact laws and regulations to accomplish the purposes set forth in this Bill and shall adopt adequate and efficient administrative measures, including management and implementation plans for the enforcement of this Bill.

Multiple framework law

It seems that the framework has been successful in integrating all

aspects of water management. However, a similar Water Framework Law was drafted by the Sub-Group on a National Water Framework Law set up by the Planning Commission's working group on Water Governance for Twelfth Plan under the chairmanship of Prof. Ramaswamy Iyer, Former Secretary, Ministry of Water Resources. While the Iyer draft clearly adopts an environmental approach by stressing on ecology, harmony, equity and social justice as a set of overarching principles governing the proposed law, the Alagh draft essentially takes a managerial-cum-economic outlook.

Some of the common provisions in the two drafts include recognizing water as a common pool resource; giving right to the state for holding water in public trust for the community; the state's responsibility as public trustee remaining even if certain services are entrusted to other agencies; relationship between water use and land use; reversing adverse impacts of interventions on water sources to the extent possible; differential water pricing; precautionary principle; and people's participation.

Both the drafts have highlighted the importance of having a national framework on water, given the fact that sustainability of water resources is at risk. However, the concept of having a national law on water has not been well received by the state governments. Some state governments feel that it is the infringement of state's power on water resources as the national law will lead to centralization of the water laws. Prof. Ramaswamy Iyer indicates that when we have national laws for environment, forests, wildlife, and biological diversity then why not for water. This argument certainly holds merit, given the fact that our scare water resources are under a lot of stress and our future survival will depend on how we effectively manage it. Though management of water has been discussed in laws related to irrigation, drainage, water supply, pollution and environment laws but having a law solely dedicated to water where it is treated as a natural resource rather than a commodity will be a welcome change.

Pritha Bhattacharya is Research Associate at Centers for International Projects Trust

Snapshot of activities: CIPTs engagement across different areas

Seminar on Efficient Use of Water Resources in Agriculture

Dr. Kamal Vatta, Director and Mr.Romit Sen, Deputy Director spoke at a seminar on Efficient Use of Water Resources in Agriculture organised by Department of Agriculture, Khalsa College, Amritsar (KCA) on December 18, 2014. Dr.Mehal Singh, Principal, Khalsa College welcomed the delegates and called for action by all users for saving water resources.

Speaking at the seminar, Dr. Vatta highlighted the challenges faced by the agriculture sector in Punjab. He indicated how following an input intensive agricultural production has led to the depletion of natural resources in the state. Dr. Vatta called for crop diversification, maintenance of soil fertility, and reforms of agricultural institutions to make agricultural practices sustainable in the times to come.

Mr. Romit Sen spoke about the overall water scenario in the world with special reference to Indian conditions. He indicated areas of physical and economic water scarcity and the impacts of water scarcity on socio-economic conditions.

Discussions during the programme indicated the grim scenario on the availability, use and management of water in the state. The students and faculty of Khalsa College opined to take forward a meaningful water conservation programme to not only increase awareness but also to move towards affirmative action in the days to come.

Review and learning session

The entire team of CIPT visited Punjab during December 14-18, 2014 to review the collaborative research and extension activities being jointly undertaken with the Punjab Agricultural University (PAU), Ludhiana. In addition to the discussions on the activities of the past year, there were deliberations on the future plans for work. Two important themes discussed during the visit were Water-Energy-Agriculture-Livelihood (WEALS) Nexus and Building Business Viable Value Chains in Agriculture.

As part of the learning session, there were lectures by experts from Punjab Agricultural University on application of GIS and Remote Sensing in Agriculture (by Dr. Anil Sood) and Groundwater Modelling (by Dr. Rajan Aggarwal). The team had fruitful interactions with Dr. SS Johl, Chancellor, Central University of Punjab and Dr. R.S. Sidhu, Director of Extension Education at PAU. The team also visited various fields, the Precision Farming Centre, and the Museum of Rural Life of Punjab at PAU. A visit was also undertaken to the organic farming centre of the Pingalwara Charitable Society, Amritsar.

The visit provided an opportunity for the CIPT team members to interact with each other, share ideas and develop action plans. The exposure visits increased the awareness on sustainable agricultural practices being undertaken by various institutions.

Roundtable on water challenges

Dr.Kamal Vatta, Director spoke at the India-U.S. Roundtable on Water Challenges held on November 19, 2014 at Greater Noida. The roundtable was organized as part of the India-U.S. Technology Summit. The objective of the round-table discussion was to look at best practices and identify opportunities for collaboration in areas of water availability, water purification, water recycling and water productivity.

Dr. Vatta spoke of the urgent need to focus attention on improving water use efficiency in agriculture, and explained how low-cost innovations currently being developed and tested by CIPT and its partners across India could help. There is a need, to scale up these technological innovations and to further engage end-users by obtaining their perspectives to better correspond with government initiatives,added Dr. Vatta.

Innovations at display

CIPT participated in the India-U.S. Technology Summit organized in Greater Noida from November 18-19, 2014. The aim of the summit was to showcase the collaboration between India and the United States on science, technology and innovation across all sectors. The Summit was inaugurated by Dr. Harsh Vardhan, Union Minister of Science and Technology and Earth Sciences, Government of India. The exhibition featured numerous exhibits with an underlying ethos of innovation, design and hi-technology, featuring all key drivers of knowledge economy and was spread over a net area of 5,800 square meters. Dr. John P. Holdren, Assistant to the President for Science and Technology, Director of the White House Office of Science and Technology Policy, and Co-Chair of the President's Council of Advisor's on Science and Technology lead the official delegation from the United States to the Summit.

CIPT set up a stall as part of the USAID pavilion at the exhibition where its low-cost water saving technologies including the tensiometer, soil moisture sensor, publications (including newsletters, flyers, brochures) and posters depicting the interactive web-based decision support system were displayed. The stall attracted many visitors who showed interest in CIPTs interventions.

Meeting with Vice Chancellor, Sardarkrushinagar Dantiwada Agricultural University, Gujarat

Dr. Kamal Vatta, Director, CIPT had a meeting with Prof (Dr.) Ashok Ambalal Patel, Vice Chancellor, and senior officials of Sardarkrushinagar Dantiwada Agricultural University (SDAU) on November 29, 2014. The delegation from SDAU included Dr. H N Kher, Registrar, Dr. R R Shah, Director of Research and Dean PG studies, Dr. M R Prajapati, I/c Dean Agriculture and Dr. S Acharya, Associate Director of Research.

Dr. Vatta gave a brief to the officers of SDAU about the initiatives of CIPT being carried out in Punjab, Gujarat and Jharkhand. He showcased successful partnerships of CIPT with organisations like USAID, IDRC, and PAU and how such partnerships have contributed towards effective utilisation of natural resources. He gave a brief on how the interventions have insured long-term sustainability of rural livelihoods.

A similar collaboration with SDAU would help farmers in Gujarat remarked Dr. Vatta. Prof (Dr.) Ashok Ambalal Patel, welcomed the move on partnership and suggested exploring research avenues to address water-energy-agriculture-livelihoods nexus in the state.

Workshop in South Africa

Dr. Kamal Vatta, Director, CIPT and Dr.Baljinder Kaur Sidana, Assistant Professor, PAU attended a Workshop on Application of Climate and Hydrological Information and its Translation into Policy being organized by Department of Environmental & Geographical Science, University of Cape Town, South Africa from October 27 to 31, 2014.

Dr. Vatta highlighted the activities of the project 'Improving food and livelihood security in Punjab through water-energy-agriculture management under climate change and variability' funded by the IDRC and being jointly implemented by CIPT and PAU. He explained the activities for examining the water-energy-agriculture and livelihood nexus to ensure long-term sustainability of natural resources in Punjab. He also explained the development of water and resource saving technologies being undertaken by CIPT in collaboration with various partners in India. He also highlighted prominent outreach activities being undertaken by PAU and CIPT to promote the project work in Punjab.

Apart from highlighting the project work, Dr. Vatta also focused on the need for integrating the research output of climate and hydrological models with economic models to add value to decision making for sustainable agriculture.

Glimpses of our initiatives in 2014

Saving water and energy through low-cost tensiometers

Promoting information technology in farming decisions

Developing digital technologies for accuracy and precision in agriculture

Optimising input use and productivity through System of Rice Intensification (SRI)

Bridging knowledge gap through ICT and decision support systems

Building capacities of farmers for generating awareness and enhancing skills

About Centers for International Projects Trust

The Centers for International Projects Trust (CIPT) is the India Office of the Columbia Water Center. Affiliated to the Earth Institute at Columbia University in New York, the Center is uniquely positioned to apply rigorous, multi-disciplinary research to solve difficult on-the-ground water resources and climate-related water risk problems. In collaboration with government agencies, civil society and private sector partners, CIPT is developing new models and research paradigms for effective water and energy management. We work towards providing rigorous, research-based knowledge as the foundation for various field based initiatives involving the local communities, government, non-government and private partners.

The Editorial Team: Kamal Vatta, Romit Sen

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USAID FROM THE AMERICAN PEOPLE

IDRC | CRDI International Development Research Centre

Canada

Centers for International Projects Trust
K-37, Green Park Main
New Delhi – 110016
T: +91-11-4056 5989
E: director@cipt.in, W: www.cipt.in