

A report on

**Consultation on the National Water Policy (2012)
Preparing a Road Map for Implementation
16th & 17th December 2013**



**Sponsored by: India water Partnership
& European Commission**

Jointly Organized by:

**Center for Environment and Development Studies, Jaipur
and
Jal Bhagirathi Foundation, Jodhpur**



CONTENT

| Item | Page Number |
|---|------------------------|
| 1. Introduction | |
| 2. Inaugural Session | |
| 3. Session I | |
| Presentation - UP, Uttarakhand, Himachal Pradesh and J & K | |
| 4. Session II | |
| Presentation – Rajasthan, Delhi, Punjab, Haryana | |
| 5. Session III | |
| Group Discussions | |
| 6. Concluding Session | |
| 7. Issues for Developing a Road Map for North Zone States | |
| Appendix I- Consultation Programme | |
| Appendix II – List of Participants | |

Consultation on the National Water Policy (2012)

1.1 Introduction - Context

Competition over limited supplies of water for various uses in agriculture, urban and industrial supply, recreation, wildlife, human consumption and maintenance of environmental quality is becoming more intense. Local farm economies face massive shortfalls of irrigation water endangering even the meager subsistence that they obtain from cultivation. Migration to urban or peri-urban areas is symptomatic of the deepening crisis in the farm and rural sectors.

A National Water Policy (2012) was released by the Ministry of Water Resources, Government of India during India Water Week, 2013 on 8th April, 2013 by Hon'ble Minister of Water Resources and presented to Hon'ble President of India. This was also circulated amongst all State Governments and related Union Ministries for necessary action. The most distinctive feature of National Water Policy (2012) is the emergence of policy recommendations through consultation meetings with Members of Parliament; Academia, Experts and Professionals; Non-Governmental Organizations; representatives of the Corporate Sector; and representatives of Panchayati Raj Institutions. None the less implementation of the policy is the responsibility of the respective State Governments as Water is listed as state subject in the Constitution. Also the water related issues are state specific depending upon the location, availability of resource and utilization pattern, i.e., supply and demand factors. Further, a state may be governed by various political parties and may have different perspective on the subject. The document is claims to have taken cognizance of the existing situation and proposed a framework for creation of a system of laws and institutions and for a plan of action with unified national perspective. However, the implementation may vary across the states.

As there is considerable diversity within the North Zone it can be divide into three sub Zones, namely Hill Region/states, Gangetic plains and Dry zone. The water issues in the North Zone are: inter-state water sharing related conflicts, environmental flow in the rivers, damming the rivers in Himalaya, River water pollution, intensive agriculture and depletion of GW, urban area water crisis, prioritizing allocation of water, depletion of GW in urban areas, sewage disposal

and treatment, water depletion and contamination, water logging and salinity, unequal access to water, etc. Does the National Water Policy-2012 address these issues and if yes, how to implement the policy prescriptions was the subject of deliberation in the consultation. It was also realized that no policy could have any meaning unless backed by an effective action plan for implementation. This consultation was also supposed to help in building broader consensus on the action plan for implementation of National Water Policy (2012).

1.2 The Approach

The North zone consultation was jointly organized by Centre for Environment and Development Studies, Jaipur (CEDSJ) and Jal Bhagirathi Foundation, Jodhpur (JBF) on December 16-17, 2013 at JBF, Jodhpur. As for proper implementation of policy recommendations would involve perspectives of different stakeholders such as State Governments, Academicians, Non Governmental Organizations, etc., two to three representatives from the eight northern States, namely J&K, Himachal Pradesh, Uttarakhand, Uttar Pradesh, Punjab, Haryana, Rajasthan and Delhi participated in the consultation.

Implementation of the policy is the responsibility of the respective State Governments as Water is listed as state subject in our Constitution. Also the water related issues are state specific depending upon the location, availability of resource and utilization pattern, i.e., supply and demand factors, therefore, the state contribution in preparing the road map is essential to attain the overall national goals.

As the identified participants from different states are directly involved in management of water resources they were requested to share their views and help preparing road map for implementation of the NWP 2012 and make a presentation covering the following points:

1. Water issues in their respective States;
2. How these issues are being addressed or will be addressed in future?
3. Whether the State water issues are been addressed in the NWP-2012(fully or partially)?
4. State's plan for implementation of the NWP-2012?

In all 129 persons representing 8 Northern States participated in the consultation of which 40 were resource persons.

In the inaugural session the Key Note Address was delivered by Dr. Avinash Tyagi, Secretary General, ICID. The other dignitaries present on the dais were HH Maharaja Gaj Singh, President, JBF; Dr. M. M Roy, Director, CAZRI; Dr. Pankaj Bhardwaj, Assistant Professor, AIMS, Jodhpur; and Sh. Om Prakash, from Wells for India.

In the Valedictory Session Sh. Suresh Prabhu was the Chief Guest and the dais was shared by Sh. Rajendra Singh, TBS, Dr. Varun Arya, Director, AIM, Jodhpur, Sh. Chakrawati Singh, Member Jal Parishad, JBF and HH Maharani Hemlata Rajye, Jodhpur. The session wise program and list of participants is attached as Annexure I and II.

Expected output/Outcome

1. Better understanding of the policy by stakeholders/participants, appreciation of regional problems, identification of areas of conflict and cooperation, arriving on consensus on implementation issues, etc.
2. Preparation of consultation report for the use of policy makers and implementers.
3. Help the IWP in achieving the objective of preparing a “Road map for implementation of National Water Policy- 2012; and (ii) Focus on how IWRM can be addressed in National Water Policy-2012.

2.1 The Consultation

The consultation was conducted in seven sessions as per the detailed program given in the Annexure I.

The consultation commenced with inaugural session by Maharaja **Gaj Singh, Chairperson, Jal Bhagarati Foundation** who welcomed all the guests and participants and thanked the sponsors



for the financial support provided by the India water partnership and The European Commission for the consultation. Contextualizing the issues of water resource management to Rajasthan, particularly the Western Rajasthan, he elaborated the principle of equity and social justice in water use. He pleaded for the participation of community and

emphasized that water should be treated as a common pool resource and should be managed by the community. On the issue of preparing road map for the National Water Policy 2012 and planning, he emphasized that it should be governed by Integrated Water Resource Management (IWRM) principle.

On the national water scenario he added that water is part of a larger ecological system. Realizing the importance and scarcity attached to the fresh water, it has to be treated as an essential component of environment for sustaining all life forms. As per the latest assessment, out of the total precipitation, including snowfall, of around 4000 billion cubic meter (BCM) in the country, the availability from surface water and replenishable ground water is put at 1869 BCM. Because of topographical and other constraints only about 60% of this i.e. 690 billion cubic meters surface water and 432 BCM ground water can be put to beneficial use. He added that availability of water is highly uneven both in terms of space and time. Precipitation is confined only to about three to four months in a year and varies from 100 mm in the western parts of Rajasthan to over 10000 mm at Cherrapunji in Meghalaya. Rivers and underground aquifers often cut across state boundaries. He went on elaborating that water, as a resource is one and

indivisible: rainfall, river waters, surface ponds and lakes and ground water are all part of one system.



On the prioritizing allocation of water he was of the view that in Western Rajasthan the first priority should be given to drinking water; second priority sanitation, third priority to domestic use and next in the list can be agriculture and industrial use.



The Context of Consultation and its structure was elaborated by Dr. M. S Rathore, Director, Centre for Environment and Development Studies, Jaipur through a presentation titled “Water Sector in India: Institutional And Legal Reforms”. Asking the question as to why water sector reforms? he narrated that we are entering a new era of water scarcity. The Golden age of water in which the three things we have taken to be natural state of our water supply – Abundant, Cheap and Safe - is no more visible mainly because of population growth. Further, all these will not be present together in the decade ahead. The new water scarcity will reshape how we live, how we



work, how we relax. It will reshape how we value water, and how we understand it. The basic objective of providing drinking water security to all, i.e., supply adequate and safe drinking water to rural and urban population, which even after 67 years of independence is a far cry.

He discussed various elements of India’s water crisis, such as, potential for further augmenting supply is limited, ground water tables are falling across the country and quality problems increasing (fluoride, arsenic, etc.) because of over exploitation, beyond sustainable limits, rivers- either ceased to flow or no more perennial, river and groundwater are highly polluted by dumping of untreated effluents and sewage. Urban water supply failed to keep pace with growth in population and size of urban areas. This state of water resources has thrown new challenges for the sustainable management of India’s water resources.

Dr. Rathore mentioned that in the XII Five Year Plan there has been major paradigm shift in management of water resources in India and that is also reflected in the new National Water Policy. The main elements of the shift are;

- Number of reforms in irrigation sector
- Participatory aquifer management
- Breaking the groundwater-energy nexus
- Watershed restoration and groundwater recharge
- A new approach to rural drinking water and sanitation
- Conjoint water and wastewater management in urban india
- Industrial water management
- Renewed focus on non-structural mechanisms for flood management
- Water database development and management
- New institutional and legal reforms

The paradigm shift is also supported by few institutional reforms, namely;

- Establishment of basin authorities –river basin as the basic hydrological unit for planning.
- Independent statutory water regulatory authority set up for each state- for appropriate pricing of water.
- A permanent water disputes tribunal at the centre - to resolve inter-state disputes expeditiously and in an equitable manner

However all this will be possible only if there are sound public policies on water resources management based on certain basic principles, such as;

- Planning, development and management of water resources need to be governed by common integrated perspective considering local, regional, state and national context, having an environmentally sound basis, keeping in view the human, social and economic needs.
- Principle of equity and social justice must be based on efficient use and allocation of water.
- Good governance through transparent informed decision making is crucial to the objectives of equity, social justice and sustainability. Meaningful intensive participation, transparency and accountability should guide decision making and regulation of water resources.
- Water needs to be managed as a common pool community resource held by the state, under public trust doctrine to achieve food security, support livelihood, and ensure equitable & sustainable development for all.
- Water is essential for sustenance of eco-system, and therefore, minimum ecological needs should be given due consideration.
- Safe Water for drinking and sanitation should be considered as pre-emptive needs, followed by high priority allocation for other basic domestic needs (including needs of animals), achieving food security, supporting sustenance agriculture and minimum eco-system needs. Available water, after meeting the above needs, should be allocated in a manner to promote its conservation and efficient use.
- All the elements of the water cycle, i.e., evapo-transpiration, precipitation, runoff, river, lakes, soil moisture, and ground water, sea, etc., are interdependent and the basic hydrological unit is the river basin, which should be considered as the basic hydrological unit for planning.

- Given the limits on enhancing the availability of utilizable water resources and increased variability in supplies due to climate change meeting the future needs will depend more on demand management and hence this needs to be given priority, especially through (a) evolving an agricultural system which economizes on water use and maximizes value from water, and (b) bringing in maximum efficiency in use of water and avoiding wastages.
- Water quality and quantity are interlinked and need to be managed in an integrated manner, consistent with broader environmental management approaches inter-alia including the use of economic incentives and penalties to reduce pollution and wastage.
- The impact of climate change on water resources availability must be factored into water management related decisions. Water using activities need to be regulated keeping in mind the local geo climatic and hydrological situation.

He concluded by mentioning that all this can be taken as guidelines for deliberating on the New National water Policy and preparing a Road map the main objective of this two days consultation.

Dr. Avinash C Tyagi, Secretary General, International Commission on Irrigation and Drainage, delivered the key note address. He pointed out that the idea of preparing action plan or Road Map for the NWP-2012 was mooted from the last section 16 of policy document 'Implementation of National Water Policy', wherein it is mentioned that a plan of action be prepared. As a follow up of the same Hashim committee was appointed and a document was prepared. Dr. Tyagi focused on the major concerns related to perception and governance.



He also discussed the issues related to sectoral management and added that management of water resources needs to be governed. He emphasized on elements of National water policy like water framework law, uses of water, adaptation to climate change, enhancing water available for use, demand management and water use efficiency and explained each of them separately.



He further added that there is a proposed legal reforms including Water Framework Law in the NWP. Framework law must recognize water not only as a scarce resource but also as a sustainer of life and ecology. Therefore, water, particularly, groundwater, needs to be managed as a community resource owned by the state, under public trust doctrine, to achieve food security, livelihood, and equitable and sustainable development for all. There is a need to change our water laws to implement the water sector reforms, the existing Acts may have to be modified accordingly. But he warned that we may not stuck in the process of changing laws.

On uses of water, he said that water is required for domestic, agricultural, hydro-power, thermal power, navigation, recreation, etc. Utilization in all these diverse uses of water should be optimized and an awareness of water as a scarce resource should be fostered. The Centre, the States and the local bodies (governance institutions) must ensure access to a minimum quantity of potable water for essential health and hygiene to all its citizens, available within easy reach of the household.

On the issue of adaptation to climate change he made very elaborate presentation giving his view point that adaptation is a process by which individuals, communities and countries seek to cope with the consequences of climate change, including climate variability. His view was that climate change is likely to increase the variability of water resources affecting human health and livelihoods. Therefore, special impetus should be given towards mitigation measures at micro level by enhancing the capabilities of community to adapt climate resilient technological options.

He emphasized on the need for information generation and serious research on different aspects of water, the country is facing today or is likely to face in future. On the availability of water resources and its use by various sectors in various basin and States in the country demand need to be assessed scientifically and be reviewed at periodic intervals, say, every five years. The trends in water availability due to various factors including climate change must be assessed and accounted for during water resources planning. Similarly, we have to analyze (a) linkage between water, food and energy, (b) efficient use of water, (c) treatment of waste water and its use in agriculture, (d) incentive and disincentive for use of waste water in industry, etc.

He concluded by mentioning that there are numerous problems but the issue is how to solve it and for that we need action rather than action plan. Presently the nation faces action crisis. People and civil society have to take action and break the talking tall and no action syndrome and move forward. The mute question is how to do it in a condition when paralysis at national government level is known and at state level it is reflection of that only. Water is the least priority of politicians. In such a situation States have to take lead and start taking action in a honest manner; stop hiding the data from people, other states, sector, etc. For example, data on *Ganga* is not secret, why there is a reason for the government to do so? *Vasudev Kutumbh* philosophy has to be adopted and share information with the people. Technology has a serious role to play in resolving our water problems and we are much behind in using technology such as, remote sensing, micro irrigation, information technology, etc. compared to even small country like Bangladesh, good at flood forecasting.



The Session ended with the vote of thanks by Ms. Kanupriya Harsh, Executive Manager, Jal Bhagirathi Foundation to the dignitaries on the dais, participants, sponsor's of the consultation namely India Water Partnership and European Union, press and media persons and the JBF and CEDSJ staff helped in the organisation of the consultation.

SESSION II: GROUP PRESENTATIONS

The Session II started with the opening remarks by the Chair Person Sh. Mahendra Mehta and Dr. M. S. Rathore giving brief outline on the India's water sector issues. Mr. Mehta raised the issue of water allocation priority in the State water policy and was of the view that drinking and domestic use should get top most priority over other uses. Highlighting the contribution of groundwater in the state he said it contributes 90 percent share of drinking water and 60 percent of irrigation water yet the State Groundwater Department being neglected when it comes to allocating funds for its up gradation. He also pointed out about the issues related to trans boundaries aquifer as it is important for the western Rajasthan having international border and the issue is not addressed in the NWP-12. Emphasizing the need for real time data on static and dynamic yield and mapping of groundwater resources. Also there is need for State Groundwater Regulatory Authority to check over exploitation in the state.

Dr. Rathore tried to list the issues to be highlighted by the speakers in different sessions so that in the group discussions can be more focused and help in drawing road map. The issues listed were as follows;

- Large parts of India have already become water stressed. Rapid growth in demand for water due to population growth, urbanization and changing lifestyle pose serious challenges to water security.
- Issues related to water governance have not been addressed adequately.
- Groundwater, though part of hydrological cycle and a community resource, is still perceived as an individual property and consequently is exploited inequitably and without any consideration to its sustainability leading to its over-exploitation in several areas.

- Inter-regional, inter-State, intra-State, as also inter-sectoral disputes in sharing of water, strain relationships and hamper the optimal utilization of water through scientific planning on basin/sub-basin basis.
- Grossly inadequate maintenance of existing irrigation infrastructure has resulted in wastage and under-utilization of available resources. There is a wide gap between irrigation potential created and utilized.
- Natural water bodies and drainage channels are being encroached upon, and diverted for other purposes. Groundwater recharge zones are often blocked.
- Growing pollution of water sources, especially through industrial effluents, is affecting the availability of safe water besides causing environmental and health hazards.
- In many parts of the country, large stretches of rivers are both heavily polluted and devoid of flows to support aquatic ecology, cultural needs and aesthetics.
- Access to water for sanitation and hygiene is an even more serious problem. Inadequate sanitation and lack of sewage treatment are polluting the water sources.
- Low consciousness about the overall scarcity and economic value of water results in its wastage and inefficient use.
- A holistic and inter-disciplinary approach at water related problems is missing.
- Characteristics of catchment areas of streams, rivers and recharge zones of aquifers are changing as a consequence of land use and land cover changes, affecting water resource availability and quality.



UTTAR PRADESH (INDIA) - PERSPECTIVE OF IRRIGATION & WATER RESOURCES MANAGEMENT

Shri. Ishwar Chand Agarwal, Chief Engineer, Water Resource Department, Uttar Pradesh was the first speaker of the session and he presented the status of water resources in the state, policies and interventions to deal with the water issues. He mentioned that the state is endowed with bountiful water resources which were considered abundant but because of increasing demand for various purposes, namely irrigation, drinking and domestic, power (thermal and hydro), industrial and other uses, its scarcity is becoming apparent which shall get more pronounced with increasing population.

In Irrigation sector, which has so far been the principal consumptive user, about 43.8 BCM (35.5 m.a.f.) of surface water and about 27 BCM (21.9 m.a.f.) (net) of ground water has been utilised out of the total of about 161.70 BCM (131.0 m.a.f.) of surface water and about 72 BCM (58.4 m.a.f.) exploitable (Total replenish able 84 BCM or 68.1 m.a.f.) ground water resource of the state. Another about 27.8 BCM (22.5 m.a.f.) of surface water shall get utilised after completion of on-going projects. 43.2 BCM (35 m.a.f.) is the quantity which cannot be utilised at present. Thus there remains only about 22.2 BCM (18.0 m.a.f.) that can be utilised in future irrigation projects after reserving about 24.7 BCM (20 m.a.f.) for drinking, industrial and pollution control.

State has a total of about 20 mha. of cultivable land out of which about 17.4 mha. is presently under agriculture. For a projected population of 270 million by the year 2020 the food grain requirement has been assessed as 63 million tonnes. With the present irrigation and other inputs productivity level of about 1.7 t/ha. has been achieved. Productivity level of 3.4 t/ha. will have to be achieved to meet the projected food grain requirements. In order to achieve this target, in addition to other inputs, irrigation facilities shall have to be adequately provided by harnessing the untapped potential and also by bringing about improvement in the management of water resources.



Mr. Agrawal was of the view that water for drinking and domestic use should be given the highest priority while allocating the water resource. The state has to provide adequate drinking water facilities (both for people and livestock) to the entire population in both urban and rural areas up to the year 2025. Sanitation facilities for entire population in urban areas and most of the rural areas should also be provided.

Action Plan for State Water Policy:

- a) The state water policy will apply to all the water resources in the State.
- b) For effective and purposeful implementation of the State Water Policy (SWP), an organisation is essential. The Government has already set up a State Water Board under

the chairmanship of Chief Secretary. This organisation shall have to be adequately strengthened to achieve the desired results. The following subjects shall have to be mainly addressed by various wings of State Water Board.

- c) State Water Planning Office: For Planning of the entire water resources of the State including ground water wherein drainage and flood control should also be taken into account preferably on the basin/sub-basin concept. This office will work as technical secretariat of the State Water Board. This secretariat would inter-alia also be a regulatory body for the water resources.
- d) State Water Resource Data Centre-for collection and storage of water resource data and making it available in user friendly manner.
- e) Development of an effective Management Information System (M.I.S)
- f) Enactment of legislation for regulation and control of surface and ground water resources and their conjunctive use.
- g) Administrative and legislative reforms for ensuring users participation in management and decentralization of authority.
- h) Preparation of perspective plan of the water resources development of the State on integrated basis within the concept of basin/sub-basin development. The proposed development shall be on the multi-sectoral basis. Special emphasis should be laid on Flood Control and drainage and seepage control measures while preparing basin/sub-basin plans. The plan includes the following:
 - 1. Irrigation Development including flood control and drainage.
 - 2. Drinking water.
 - 3. Hydro power development.
 - 4. Industrial use including Agro-industries.
 - 5. Navigation and Recreation.
 - 6. Ecological requirements.

The plan of development should be so designed so as to achieve the targets within the stipulated time frame and indicate broad financial forecasts. The financial forecast for the layout of technical secretariat and S.W.R.D.C. of the State Water Board shall be indicated.

The water resources development Plan shall have necessarily to be collectively prepared by all the concerned user departments spelling out time schedule and financial forecasts.

Status of Works

The Canal Systems are running 65 to 75% of design capacity due to following major factors: siltation and poor maintenance, Insufficient Control Structures, Wastage of Water, Water logging, saliniazation, Impeded Drainage, Low agriculture yield. Also there is huge gap between potential created and utilization of irrigation mainly because of; Physical constraint, Poor and deferred maintenance, Reduced efficiency, Excessive irrigation in head and less in tail reaches, Poor service delivery, Institutional constraints. This gap has resulted in inequality, low yield, low income, and low financial returns. Therefore, there is a need for rehabilitation of irrigation Projects in the state.

To address the above listed problems the strategies proposed to be adopted are as follows:

- Integrated Basin development approach
- Water Service Delivery System improvement
- State Water Policy
- Water Resources Management
- Restructuring of UP (India) Irrigation Department
- Water Pricing and Water Tariff Regulation
- Participatory Irrigation Management
- Agriculture Intensification and Diversification
- Environment and social sustainability

Uttar Pradesh Water Sector Restructuring Project is first project of its kind in the country; initiating fundamental reforms in institutions, planning and management of water sector to address its problems and attain sustainable management of water resources.

Actions/Achievements of UPWRD

1. Creation of apex water institutional structure and strengthening multi-sectoral water resources & environmental management capacity adopting IWRM approach.
2. State Water Resources Agency (SWRA) and State Water Resources Data Analysis Center (SWRDAC) are functional.
3. UP WMRC (Uttar Pradesh Water Management and Regulatory Commission) Act enacted and Participatory Irrigation Management Act approved by the State Cabinet.
4. Jaunpur Branch Sub-Basin Development and Management Board (JBSDMB) is functional.
5. Participatory Irrigation Management Program: PIM Act approved by the State Cabinet. In total 4679 Water User Associations (WUAs) at outlet level and their representative WUAs in all 421 minors are functional.

Issues to be addressed:

- a. Long term integrated water resource planning to maintain the surface and groundwater balance in all the river basins
- b. In case of inter-state water sharing and conflict resolution there is a need for a national level law and institution to resolve emerging issues.
- c. Emerging water scarcity and depleting surface and groundwater quality is big issue. It requires political will, peoples' participation and large fund for creating infrastructure.
- d. Need for new management system, i.e. change in governance system to augment supply, improve quality of water and increase efficiency in various uses.
- e. Transboundary issues need to be addressed at national level.
- f. Ensure environmental flow in all the major rivers in the state as per the national policy directives.
- g. Check pollution in the rivers

Punjab: Water Resource Management

The state of Punjab while occupying only 1.57 percent geographical area of India. More than 83 percent of land in Punjab is under agriculture as compared to the national average of 40.38%. Three perennial rivers, namely the Sutlej, Beas and Ravi, flow through the state. In addition, the Ghaggar, which is a seasonal river, flows through the southwestern part of Punjab. Net Area Sown is 41.71 lac hectare. (83 percent of total geographical area) of that 97 percent is irrigated and having a cropping intensity of 190 percent. This was possible because of existence of about 14500-km-long canal network and extensive use of groundwater in the state.

Punjab has about 14500-km-long canal network and about 1 lakh km of Water courses, providing irrigation to 1.19 million hectare, which form 28.8 percent of total culturable area of the State (Year 2006-07 P). However, the network of canals, which is more than 150 years old, is unable to take its full discharge, as it requires major rehabilitation and rejuvenation.

Punjab needs 50 MAF water, whereas allocation of State's surface water resources from its main rivers are limited to 14.54 MAF only. As a result, groundwater has become a major source of irrigation in the State. There has been intensive groundwater extraction in the last four decades through installation of shallow tube-wells by individual farmers, showing an increase of 521percent during last 35 years. Out of the total 137 Blocks of the State taken for study 103 Blocks are over exploited where stage of ground water development is more than 100%.

Contrary to the problem of depletion of water table in 128 blocks, 3 blocks in South-West Punjab are facing acute problem of water logging. A number of other adjoining blocks will also be facing very serious problem of water logging in the near future due to rising water level trends in the area.

Therefore, the state of Punjab needs to be given greater share in its river waters to decrease stress on ground water resources and power consumption.

Another important aspect is water quality, which is impacted by untreated or inadequately treated industrial effluents and sewage flowing into nallahs and rivers. The problem is further compounded by the mixing of storm water and sewage in various municipal towns as these carry solid waste, bio-medical waste and hazardous waste from city roads into the water bodies. The pollution and contamination of water resources due to industrial waste, sewage and excessive use of chemical/pesticides in agriculture has led to high pH, BoD, DO, faecal coliform & concentrations of Arsenic etc. As such, special attention would have to be given to these aspects to provide safe water. Therefore, change in existing strategies, innovation of new cost effective techniques resting on a strong science and technology base are needed to eliminate the pollution of surface and ground water resources.

State's population in small pockets does not have access to potable drinking water. The quality of drinking water, particularly in South- West Punjab, where ground water is saline and not fit for drinking/irrigation, is also a major concern of the State.

The demand for water in rural areas is expected to increase sharply as the economic condition of the rural masses improves. Demand for water for hydro and thermal power generation and for other industrial uses is also increasing substantially, causing a greater pressure on our depleting and scarce water resource. This underscores the need for efficient and effective use and conservation of water.

Despite the infrastructure of Dams and large Head Works on all major rivers and Low Dams on excessive discharging rivulets of the State, occasional excessive flood waters, which cannot be impounded upstream of the dams, have to be passed downstream keeping in view the regulation norms based on the safety of dams. There is a need to adopt coordinated management approach to minimize the floods in the state, to have suitable drainage policy for annual maintenance of drains and to ensure optimum utilization of created hydropower and irrigation potential.

The water vision emerging out of the status of water availability and use is that the state wants to reduce dependence on underground water and utilize surface water for irrigation purpose. In order to achieve that the strategy is to increase the canal capacity, lining/remodeling of water courses and construction of check dams in hilly areas. Further, there has to be planning to take following measures:

Action Points

1. An appropriate Regulatory Authority should be established with representation of key stake holders for the planned development and management of water resources in the State. For equitable distribution and utilization of water in agriculture, Participatory Irrigation Management Schemes (PIMS) shall be further encouraged.
2. Water Sharing / Distribution amongst the Basin States.
 - (a) The State shall endeavour to develop and manage its river systems in accordance with the internationally accepted riparian principles. The needs of riparian/basin states should be the basis for sharing/distribution of river waters.
 - (b) Inter-basin transfer of water should in no case be permissible from a deficit basin to a surplus basin.
 - (c) Large scale trans-basin diversion of river water from Punjab to other States has adversely affected the irrigation requirements of the State, besides causing adverse impact on its hydrology, ecology and environment. The State shall carry out an assessment of these effects and work for their removal.
3. Legislation and Regulation
It shall be the endeavour of the State to formulate a new comprehensive and unified legislation on management and administration of canals and drains in the State.

Delhi: Water Issues and Solutions

The presentation on Delhi State Water Issues and Solutions was made by Dr. Hardeep Singh, SPWD, Delhi. Detailing on the sources of water supply to Delhi Dr. Singh mentioned that Delhi hardly have its own source rather has to depend on surface water from adjoining states and groundwater, which contributes significantly in the total supply. However, the groundwater source is declining because of overexploitation and leaving no open area for recharge.

The state water utilization can be grouped in two parts; first, for drinking and domestic use, and second, other uses (industry). The major problems are; coverage- pipe supply is not adequate to cover the total area of Delhi. On top of that there are 40% distribution losses. Groundwater is declining at the rate of 10 feet per year. Therefore, the quality of groundwater is deteriorating. Sewerage system is collapsing and proper disposal of solid waste is becoming a big problem. Though it is officially claimed that Jal Board is supplying, on an average, 250 lpcd of water but it is unevenly distributed across the city. Encroachment of flood zone, the main area for groundwater recharge is becoming a major problem.

As regards other users of water the problem is more of disposal of used water as that is contaminating surface and ground water sources. Also there is no regulatory control over the commercial users of water.



Solutions to the Delhi water problems

Generally the first recommendation to the drinking water problem is demand management through appropriate pricing and on that most governments have failed for one or the other reason. The other solution is supply augmentation and that can be done in many ways; firstly, explore possibility of drawing water from Uttarakhand or Himachal Pradesh. The second option is treat the huge amount of waste/sewage water generated from the city and recycle for many uses. There is tremendous scope in going for this option with the help of selecting efficient and appropriate technology and allocation of funds for installation of treatment plants. The other option is augmenting groundwater supply by taking regulatory and physical measures, such as promulgation of Ground Water Regulatory Act, making rainwater harvesting compulsory, identification of groundwater recharge areas and recharging with rainwater, floods, treated water, etc.

The problem is also of multiple institutions involved in water resource management and lack of coordination among them. Secondly, the solution of the problem also lies in the way we perceive water problems of Delhi and with the increase in population with increase in size meeting water

demand will be a big challenge. There is a need for independent authority to regulate water supply in Delhi. Yamuna River the main source of water supply to Delhi requires a minimum environmental flow to take care of quality problem. Since this brings other states in the picture the problem becomes of interstate sharing of water and has to be dealt at central level, the policy recommendation in the NWP-12 becomes important to resolve the problem at large.



SESSION III

The Chair Person Dr. Goutam Sadhu in his opening remarks drew attention to one big gap in the NWP-12 document on the role of NGOs/ civil society in water resources management in the country as it does not find place in any section of the document despite their significant contribution in the last two decades. The second point he raised was water and sanitation issues relating to urban population, more specifically the large urban slum population. As the urban areas and population is growing fast and likely to further increase at much faster rate the access to water and management of urban water will be a major challenge in India.



Rajasthan: Water Management Issues and Actions

Pradeep Mathur, Chief Engineer, State Water Resources Planning Department, Government of Rajasthan made presentation highlighting the special features of State Water Policy 2010 and discussed about the water sector reforms in the state. Giving the historical account of water policies in Rajasthan he mentioned that there is paradigm shift in the SWP-2010 and first time in the country in any state's water policy it is mentioned that state is neither owner of water resources nor the manager rather state acts as a facilitator to people to manage the state water resources by formation of water user groups at Gram Panchayat level. He listed the critical water sector issues in the state as follows:

1. Growing Imbalance between demand and Supply of Water- (8-10 BCM)
2. Uncertainty in Water Availability- (Dependence on interstate share in water)
3. Inequity in Access to Water-(Urban- Rural; Head –Tail Reach; Rich- Poor)

4. Low Operational Efficiency of water Resources Systems (Agriculture; Domestic Water Supply, Industries)
5. Depleting Groundwater Resources (only 25/243 blocks are safe)
6. Deteriorating Ground Water Quality
7. High Cost of Service, Low cost Recovery
8. Low Level of Expenditure on O&M
9. Lack of Ownership Amongst Stakeholders
10. Implementation of Inter State Water Sharing Agreements
11. Improving Water Governance

The water sector reforms as guided by the State Water Policy 2010 were discussed and the list is as follows:

- a. Radical Shift from Predominantly Engineering Based to Local Community Based Water Management by formation of Water User Groups at Gram Panchayat level and assist them by formulation of Technical Support Group at Block Level.
- b. Adoption of Integrated Water Resources Management (IWRM) Approach- Combination of “bottom up” and “top down” decision making and technical support
- c. Demand Side Management to narrow down the imbalance between supply and demand.
- d. Water Allocation Priorities
- e. Benchmarking and Water Audit
- f. Critical review of Water Laws and formulation of comprehensive water law for the state.
- g. Introduction of PPP model in urban water management
- h. Rationalization of Water tariff
- i. Preparation and implementation of Water Policy Action Plan
- j. Management and Regulation of Ground Water Exploitation by preparing a groundwater bill
- k. More input of research in governance and management of water resources in the state by commissioning Impact Assessment Studies of Irrigation Projects.

Serious efforts are made to address critical issues and implement the above listed items by taking the following actions:

1. Adoption of IWRM Approach- IWRM Plans for 3182 Gram Panchayats are prepared in 11 Districts under EU-SPP
2. Capacity building of people and implementation of programs through NGOs.
3. To improve irrigation and water use efficiency, rehabilitation, restoration and modernization/rehabilitation of major, medium and minor irrigation projects taken up under RWSRP, JICA and other schemes.
4. Water quality problem, particularly presence of fluoride in ground water in large parts of state has been addressed by shifting of drinking water schemes from ground water source to surface water to address quality issues, particularly in rural areas.
5. Water Transfer from surplus to deficit regions of the State by initiating small link schemes.
6. Improving Water Resources Infrastructure.
7. Improvement in Data Collection; Analysis; Dissemination and Sharing of water related data by launch of official port and put water sector data in public domain.

8. Aquifer Mapping for Ground Water Management is the unique achievement of the state as entire Rajasthan is covered and data is available in public domain.
9. Promoting Treatment, Recycle and Reuse of wastewater in all user sectors.
10. A draft comprehensive water laws document was prepared and was put before the stakeholders for discussions and suggestions were received and the government is now in the process of revision.
11. Capacity Building of Water Related Departments for Efficiency Improvement.
12. Promoting Water Saving Technologies in all Sectors.
13. Introducing Volumetric Measurement and Metering in all its uses.

As regards drawing items from the NWP-2012 for implementation in the state he was of the view that both state and national water policies aimed at economical, efficient and optimum use of available water resources and stressed on Integrated Water Resources Management, but in the NWP, priorities of Water Allocation are not clearly defined and we have taken stand in SWP, that Human drinking water will be given top priority followed by agriculture. This is in line with the national and state objectives of providing drinking water security and food security to people of Rajasthan. The other pertinent recommendation of the national water policy is formulation of Water Regulatory Authority and River Basin Authorities in the state to be established as a part of water governance reforms. The Water Regulatory Authority Bill was prepared and passed by State Assembly but the rules, other implementation guidelines and appointment of Chairman are in progress.

Uttarakhand: Views on the Draft of National Water Policy Irrigation Department

Shri Prashant Bishnoi, SE Planning and Shri. Suresh Bhai, Himalaya Paryavaran Shiksha Sansthan made presentations on the status of water sector in the state of Uttarakhand. Mr. Bishnoi started by saying that the state is a land of rivers. Water is one of the most crucial elements in development planning. The state is of the view that water should be declared as national asset rather than economic good/commodity. As regards the prioritizing the water uses the norms should be as follows:

- Drinking water should get top priority.
- Other priorities should be decided by the respective states according to their regional demands.
- Ensure ecological and environmental balance while developing water resources.
- Promote equity and social justice among individuals and groups of users.
- Flood Management and drainage should be the integral part of water resource development.

Their views on the water resources planning are: A river basin or a sub-basin in case of surface water along with the corresponding aquifer for ground water should be considered as a unit of development while planning water resources of the state rather than consideration of an individual project.



As regards water pricing is concerned the state is proposing to set up a "Tariff Regulatory Body" for the determination of water charges and also look into the possibilities of levying cess on the areas protected from floods and suggest ways and means for the enforcement keeping in view the wider socio-economic perspective.

Looking at the scarcity value of water resources and need to conserve and keep this resource pollution free and to ensure its most efficient use, legislation in the following areas need to be considered by the state.

- Regulation of exploitation of surface and ground water for diverse uses.
- Regulation of discharges made into surface and ground water sources by various agencies.
- Regulation in respect to bulk supply of water for irrigation and other purposes to associations.
- Creation of water rights in favour of users.
- Transfer of irrigation systems to users especially in respect of small and marginal farmers.

It is also proposed that all the water resources projects shall give due regard to the ecological health and other needs for which adequate provision shall be made on priority basis.

Action Plan for SWP:

1. For effective and purposeful implementation of the State Water Policy a strong organisation is essential. The Government has already set up a State Water Board under the chairmanship of Chief Secretary.
2. Enactment of legislation for regulation and control of surface and ground water resources and their conjunctive use.
3. Administrative and legislative reforms for ensuring users participation in management and decentralization of authority.
4. Preparation of perspective plan of the water resources development of the State on integrated basis within the concept of basin/sub-basin development. The proposed development shall be on the multi-sectoral basis. Special emphasis should be laid on

Flood Control and drainage and seepage control measures while preparing basin/sub-basin plans.

5. Ground water depletion should be checked immediately. Recycling and reuse of water and construction of check dams should be promoted. Rain water harvesting and ground water recharge should be promoted through pilot projects where necessary.
6. Canals in the state be maintained properly and for this, adequate funds should be made available. At present these funds are only one-third of the demand. Water channels must be preserved through regular cleaning and tanks should be lined to reduce seepage.
7. There should be strict regulation to control water pollution. No effluent or waste water should be allowed to be discharged into river without proper treatment. Pollution Control Department should strictly monitor it.
8. Use of micro-irrigation like sprinkler and drip irrigation should be encouraged for conservation and efficient use of water. For minor irrigation projects norms of cost per hectare should be relaxed up to double especially in hill area.
9. Inter State water disputes are obstacles in optimum development of water resources. Centre must amicably resolve inter State water disputes.
10. The Flood Prone Zoning Act framed by the state should be made mandatory and national government should provide support it.

Mr. Suresh Bhai representing the Himalayee Paryavaran Siksha Sansthan was very critical of Uttarakhand State Water policy and was of the view that state is blindly going for collection of revenue at the cost of degradation of natural resources, i.e. land, water and forest and aspiring to make it 'energy state' by allowing construction of 558 hydropower projects. The ownership of land, water and forest is getting out of the hands of common man. Emphasizing on the need for construction of eco-friendly water bodies rather than large dams and inter basin transfer of water so to minimize the negative environmental impact of the state development policies.

J & K Water Resource Management Issues and Actions

Shri Ramesh Chandra Sharma, Paryavaran Kutir made presentation on the state of Jammu & Kashmir. He mentioned that the State Water Policy and Plan for the development, management, planning, utilization and monitoring of water resources is mainly guided by the Jammu and Kashmir Water Resources (Regulation and Management) Act, 2010 and Rules SRO; 30, Jan.24, 2011 and there is no other State Water Policy document. As per these two documents, i.e. the Act and Rules, the state manages its resources and addresses the emerging issues as follows:

1. The development of an effective institutional mechanism for coordinating the management of water resources on a hydrological unit basis with a multi sectoral and multi disciplinary approach;
2. Treatment of effluents, solid/ gaseous wastes which are discharged into the natural streams, water bodies and have the potential of contaminating the ground water through seepage, leaching to acceptable standards before these are released by the industries, institutions, residential and commercial areas;

3. Preparation of basin master plan to assess the water needs for various uses and also to assess the potential resources so as to prioritise the water resource development;
4. Involvement of user associations, local bodies and other voluntary agencies in operation, maintenance and management of schemes or parts of schemes with a view to eventually transfer these to the user groups and local-bodies;
5. Empowerment of such user groups and local bodies to collect water charges and delegation of specific functions, necessary for effective management of the schemes;



As a part of legal reforms the state government promulgated an Act namely, Jammu and Kashmir Water Resources (Regulation and Management) ACT, 2010. The Act is to consolidate the law relating to use of water, the measurement, construction, control and management of works with respect to water storage, conservation and protection, irrigation, water supply, drainage, flood control and prevention, improvement in the flow of water, protection and improvement in the physical integrity of water courses, lakes and springs, safety and surveillance of dams.

As per the Act water resources is the property of the Government and following conditions apply: (1) Every water source in the State is, and shall remain, the property of the Government and any proprietary ownership, or any riparian or usage right, on such water resources vested in any individual, group of individuals or any other body, corporation, company, society or community shall, from the date of commencement of the Act, be deemed to have been terminated and vested with the Government. (2) No person shall use any water from any source (surface or ground), or collect or extract any material from such water sources except in accordance with the provisions of the Act.

The other important step in the light of NWP -12 it is proposed to establish a State Water Resources Regulatory Authority for regulating water resources, ensuring judicious, equitable and sustainable management, allocation and utilization of water resources, fixing the rates for use of water and matters connected there with or incidental thereto.

Issues and Action Plan

1. Trans boundary issue in sharing of water needs to be dealt with at national level.
2. Groundwater exploitation without a proper groundwater recharging plan. More studies on groundwater balance are required for planning.
3. New industries are coming up on the banks of rivers without regulation/control on discharge of pollutants consequently affecting the quality of water and health of people.
4. Need for water regulatory authority to deal with above listed issues already covered earlier.
5. Rehabilitation of irrigation structures in a time bound manner.

HIMACHAL PRADESH

In Himachal Pradesh availability of water is highly uneven in both space and time. Precipitation is confined only to about three or four months in a year and varies from about 600 mm in Lahaul & Spiti district to around 3200 mm in Dharamshala in District Kangra. However, in spite of heavy rain and snow during the rainy season and winter the summer months are periods of water scarcity in many areas as the flows in the rivers and nallahs are quite low and traditional sources also dry up. This results in forced migration of humans and animals to the banks of rivers with perennial flows. On the other hand, heavy rains regularly cause havoc due to floods. Flash floods also cause damage in the higher reaches of the State. In addition, there are challenges of frequent floods and droughts in one or the other part of the state. With a growing population and rising needs of fast developing urbanization & higher living standards, as well as the given indications of impact of climate change, availability of utilizable water will be under further strain in future with the possibility of deepening water conflicts among different user groups. Low awareness about the scarcity of water and its life sustaining and economic value results in its mismanagement, wastage, and inefficient use, as also pollution and reduction of flows below minimum ecological needs. In addition, there are inequities in distribution and lack of a unified perspective in planning, management and use of water resources. The objective of the State Water Policy is to take cognizance of the existing situation, to propose a framework for creation of a system of laws and institutions and for a plan of action with national perspective.

The present scenario of water resources and their management in Himachal Pradesh has given rise to several concerns, important amongst them are;

- 1) Some parts of state have already become water stressed. Rapid growth in demand for water due to population growth, urbanization, changing lifestyle and industrialization pose serious challenges to water security.
- 2) There is wide temporal and spatial variation in availability of water, which may increase substantially due to a combination of climate change, causing deepening of water crisis and incidences of water related disasters, i.e., floods, increased erosion and increased frequency of droughts, etc.
- 3) Access to safe water for drinking and other domestic needs still continues to be a problem in some areas. Skewed distribution of water between different regions and different people in the same region and also the intermittent and unreliable water supply system has the potential of causing social unrest.
- 4) Groundwater, though part of hydrological cycle and a community resource, is still perceived as an individual property and is exploited inequitably and without any consideration to its sustainability leading to its over-exploitation in several areas.
- 5) Water resources projects, though multi-disciplinary with multiple stakeholders, are being planned and implemented in a fragmented manner without giving due consideration to optimum utilization, environment sustainability and holistic benefit to the people.
- 6) Inter-District, inter-Panchayat, inter-consitutory, as also inter- sectoral disputes in sharing of water, strain relationships and hamper the optimal utilization of water through scientific planning on basin/sub-basin basis.

- 7) Grossly inadequate maintenance of existing irrigation infrastructure has resulted in wastage and under-utilization of available resources. There is a widening gap between irrigation potential created and utilized.
- 8) Natural water bodies and drainage channels are being encroached upon, and diverted for other purposes. Groundwater recharge zones are often blocked.
- 9) Growing pollution of water sources, especially through industrial effluents, is affecting the availability of safe water besides causing environmental and health hazards. In parts of the state, some stretches of rivers are heavily polluted and devoid of flows to support aquatic ecology, cultural needs and aesthetics.
- 10) Access to water for sanitation and hygiene is an even more serious problem. Inadequate sanitation and lack of sewage treatment are polluting the water sources.
- 11) Low consciousness about the overall scarcity and economic value of water results in its wastage and inefficient use.
- 12) Lack of adequate trained personnel for scientific planning, utilizing modern techniques and analytical capabilities incorporating information technology constrains good water management.
- 13) A holistic and inter-disciplinary approach at water related problems is missing.
- 14) The public agencies in charge of taking water related decisions tend to take these on their own without consultation with stakeholders, often resulting in poor and unreliable service characterized by inequities of various kinds.
- 15) Characteristics of catchment areas of streams, rivers and recharge zones of aquifers are changing as a consequence of land use and land cover changes, affecting water resource availability and quality.

Implementation of National Water Policy- Views of Himachal Pradesh

The state is of the view that State Water Management Board should prepare a plan of action based on the National Water Policy, as approved by the State Water Resources Council, and to regularly monitor its implementation.

In response to the water sector reforms proposed in the NWP-12 particularly setting up of a Water Regulatory Authority. The state has prepared a draft Himachal Pradesh Water Regulatory Authority Act, 2011. The Act will provide for the establishment of the Himachal Pradesh Water Regulatory Authority to regulate water resources within the State, facilitate and ensure judicious, equitable and sustainable management, allocation and optimal utilization of water resources for environmentally, economically sustainable development of the State, fix the rates for water use for agriculture, industrial, drinking, power and other purposes and levy cess on lands benefited by flood protection and drainage works from the owners of lands benefited through appropriate regulatory instruments according to State Water Policy and matters connected therewith or incidental thereto.

Clearly, a number of issues and challenges have emerged in the development and management of the water resources in the state but few issues are very specific to the nature of geographical condition of the state, such as, floods and land erosion by rivers and tributaries, provision of drinking water to the dispersed households settled at different elevation in the hills, irrigation water management in case of terrace farming, etc. Though, these issues are directly not

addressed in the NWP-12 but are covered generally. However, the State in its water policy document addresses these, for example, on floods and land erosion the state policy is a Master Plan for flood control and management for each flood prone basin shall be prepared. Adequate flood cushion should be provided in water storage projects, wherever feasible, to facilitate better flood management. In highly flood prone areas, flood control may be given overriding consideration in reservoir regulation policy even at the cost of sacrificing some irrigation or power benefits. While physical flood protection works like embankments, spurs and dykes will continue to be necessary, increased emphasis should be laid on non-structural measures such as flood forecasting and warning, flood plain zoning and flood proofing for minimization of losses and to reduce the recurring expenditure on flood relief measures. There should be strict regulation of settlements and economic activity in the flood plain zones along with flood proofing, to minimize the loss of life and property on account of floods. The flood forecasting activities should be modernized, value added and extended to uncovered areas. Inflow forecasting to reservoirs should be instituted for their effective regulation.”

The State is of the view that water resources development and management has to be planned for a hydrological unit such as drainage basin as a whole or for a sub-basin, multi- sectorally, taking into account surface and ground water for sustainable use incorporating quantity and quality aspects as well as environmental considerations. On institution arrangement for river basin level planning the state proposes the following; With a view to give effect to the planning, development and management of the water resources on a hydrological unit basis, along with a multi-sectoral, multi- disciplinary and participatory approach as well as integrating quality, quantity and environmental aspects, the existing institutions at various levels under the water resources sector shall be appropriately reoriented/reorganized and even created, wherever necessary .The institutional arrangements should be such that the aspect of maintenance of water related schemes is given importance equal or even more than that of new constructions.

Development and management of a river basin as a whole or sub-basins, should take place in a planned manner involving multi-disciplinary units that prepare comprehensive plans taking into account not only the needs of irrigation but also harmonizing various other water uses, so that the available water resources are determined and put to optimum use.

On ownership and inter basin transfer of water the view is that overriding ownership rights over water sources rest with the State. Water may be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a state perspective, after taking into account the requirement of areas/basins. Water scarce neighbor hoods will enjoy priority entitlement to avail water available in adjoining areas for meeting their drinking water needs.

The rivers in the state also play some role of navigation, particularly in transfer of forest resources, therefore, the view is that rivers and other water bodies should be considered for development for navigation as far as possible and all multipurpose projects over water bodies should keep navigation in mind right from the planning stage.

The State government supports most of the water sector reforms suggested in the NWP-12 and is trying to implement also.

Strategies and approach to address State water issues

1. All the elements of the water cycle, i.e., evapo-transpiration, precipitation, runoff, river, lakes, soil moisture, and ground water, sea, etc., are interdependent and the basic hydrological unit is the river basin, which should be considered as the basic hydrological unit for planning.
2. Water quality and quantity are interlinked and need to be managed in an integrated manner, consistent with broader environmental management approaches inter-alia including the use of economic incentives and penalties to reduce pollution and wastage.
3. There is a need to evolve a State Framework Law as an umbrella statement of general principles governing the exercise of legislative and/or executive (or devolved) powers by the state and the local governing bodies. This will lead the way for essential legislation on water governance in every unit of the state and devolution of necessary authority to the lower tiers of government to deal at local level. Such a framework law must recognize water not only as a scarce resource but also as a sustainer of life and ecology. Therefore, water, particularly, groundwater, needs to be managed as a community resource held, by the state, under public trust doctrine to achieve food security, livelihood, and equitable and sustainable development for all. Existing Acts may have to be modified accordingly.
4. Inter-basin transfers are not merely for increasing production but also for meeting basic human need and achieving equity and social justice. Inter-basin transfers of water should be considered on the basis of merits of each case after evaluating the environmental, economic and social impacts of such transfers.
5. Environmental needs of Himalayan regions, aquatic eco-system, wet lands and embanked flood plains need shall be recognized and taken into consideration while planning.
6. Integrated Water Resources Management (IWRM) taking river basin / sub-basin as a unit shall be the main principle for planning, development and management of water resources. The departments / organizations at Centre / State Governments levels should be restructured and made multi-disciplinary accordingly.
7. Appropriate institutional arrangements for each river basin should be developed to collect and collate all data on regular basis with regard to rainfall, river flows, area irrigated by crops and by source, utilizations for various uses by both surface and ground water and to publish water accounts on ten daily basis every year for each river basin with appropriate water budgets and water accounts based on the hydrologic balances. In addition, water budgeting and water accounting should be carried out for each aquifers. Appropriate institutional arrangements for each river basin should also be developed for monitoring water quality in both surface and ground waters.

Session IV Group Discussion

A ROAD MAP ACTION PLAN PRESENTATION OF SUBGROUPS

In the Group Discussion session the participants were asked to join any of the three groups formed on the basis of geographical boundary. The three groups were; Group I; J&K, Himachal Pradesh, and Utrakhand, Group II: Uttar Pradesh, Punjab, Haryana and Delhi and the Group III: Rajasthan and Haryana. Chair Persons for each group was appointed and asked to deliberate on the issues highlighted in the state presentations. The group leaders were asked to present the group reports. Based on these reports the section on Road Map was prepared. The Group Leaders were; Dr. Pradeep Bhargava, GB Pant Institute, Allahabad, Dr. Gautam Sadhu, Professor, IIHMR, Jaipur and Sh. Rajendra Singh, Chairman Tarun Bharat Sangh.



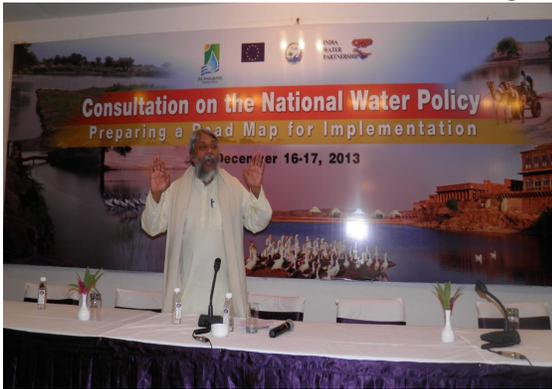
SESSION V: VALEDICTORY SESSION

In the Valedictory Session Sh. Suresh Prabhu, was the Chief Guest and the dais was shared by Sh. Rajendra Singh, TBS, Dr. Varun Arya, Director, Aravali Institute of Management, Jodhpur, Shri Chakrawati Singh and HH Maharani Hemlata Rajye, Trustee, Jal Bhagirathi Foundation, Jodhpur.

Rajendra Singh started his address by mentioning that 'Water' is considered to be 'Aarogya (health)' but unfortunately is becoming the source of human illness. It is mainly because our water sources, namely rivers, dams, groundwater and traditional water bodies are polluted and there is either no law or not implemented properly to check point and nonpoint source of pollution and polluters. Our rivers are at the verge of death, i.e., either ceased to flow or become the carrier of sewer, mainly of urban townships and industrial areas.

To enable rivers to be rejuvenated and to be able to sustain its existence and provide eco system services for generations to come there is need for National River Policy. He suggested following measures:

1. **River Rejuvenation:** Adoption of Integrated Water resource Management approach in all river basins, sub-basins and watersheds. It should be participatory and based on use of traditional and modern knowledge of water resource management.



2. **Management of River:** Community based river organization be formed. Governance of rivers should be completely transparent and participatory and managed by people by constituting an organization like River Arvari Parliament.
3. **Clean Rivers (Pollution Free):** No mixing of river & sewer/ effluents. Surface and ground water pollution by individual, group, community, industry or any other should be treated as criminal act and must have legal provisions for severe punishment and not penalties.
4. **Ensured Environmental flow:** Balance has to be maintained between surface and groundwater use in all the river basins to check the alarming status of groundwater. The problem can be handled only by ensuring environmental flow in all rivers in the country.
5. **Land of rivers:** Demarcated base flow, flood plain, high flood plain for all major rivers in the country. Clear demarcation from head waters to ocean, defined as reserved areas based on last 100 years flood data. Community participation in identification of these areas should be ensured.



Shri Chakravati Singh, Member, Jal Parishad, JBF in his address highlighted the works of Jal Bhagirathi Foundation in Western Rajasthan and draw attention on three contemporary issues of western Rajasthan. First, the big dams have definitely helped in increasing our food production but in much smaller area. However, created inequity in access to water resources by not releasing water down streams of the rivers. Giving example of Jawai Dam in Pali District he

pointed out that large number of wells on the downstream of river became dry, denying recharge of groundwater consequently affecting the livelihood of large number of population. Therefore, he pleaded for release of minimum environmental flow from all dams.

The second issue he touched upon was the river water pollution, particularly in Pali and Balotra in Jodhpur District affecting the surface and groundwater, seriously affecting drinking water and health of people. Third, he highlighted, with examples scope for water conservation and saving water in all its uses.

Sh. Suresh Prabhu, Chief Guest in the valedictory Session highlighted the growth in India's population attaining the figure of 130 crores, mentioned that there is serious concerns about water. Water is life of all, i.e. people, flora & fauna. The priorities of water use cannot be fixed and implemented only because of big gap between supply and demand. Despite this gap he supported the debate on release of environmental flow in our rivers. He was of the view that if water related problems are ignored no governments can survive and the future will be very challenging for water managers.



On the national water policy he commented that having a water policy document is important but implementation part is more important and therefore, suggested few points for consideration;

1. Policy should be based on ground reality.

2. After formulation of policy, implementation should be taken more rigorously and strictly with strong political will.
3. IEC of policy is very essential.

All this is possible only when there is a water governance structure, from top starting at the state level to district and taluka level with participation/involvement of all the stakeholders and the structure has got a legal sanction/authority. On prioritizing water use his view was that water distribution within the state, at district level be done after listing priority in usage taking care of regional equity and development. At the same time, there has to be guidelines for the district level water authority and those be as follows;

- Rivers must flow, therefore, minimum environment flow is needed and that should be ensured by all means.
- Rivers also act as water storage system and have self purifying capacity, hence they be protected.
- Protecting environment entails reserving water for environment considering that as one of the uses.
- Water is life/ health so protecting and maintaining its quality is extremely important and the authorities at all levels should ensure it.
- Fix the role and responsibility of industry, Municipal Corporations, urban authorities, and people to protect the quality of water.

He expressed that we generally neglect the issue of implementing structure, rather emphasized more on attaining the policy/program objectives. In this regards international and national agencies, namely GWP, World Bank, emphasizing upon River Basin as a unit of water management and river basin authority as the agency to manage. He was of the view that River Basin as unit is more problematic as its boundary cuts across districts and states leading to more conflict than solution. Therefore, he suggested a lower level authority and that as district level and listed several advantages of it, such as, more functional, easy in distribution of available water, easy in allocation of funds, more scope for convergence of many rural development and water management national and state programs. It will also reduce water related conflicts. Lastly, giving the example of Punjab this model will help in controlling groundwater overexploitation. There is immediate need for groundwater recharge action plan for each state in the country.

On the political aspects and guide to civil society working on water issues, he was of the view that water expert be made Minister and as water issues are national problem so let us not fight among ourselves rather come together and fight for water. Indicating the issues of inadequate and mismanaged existing water infrastructure there is definite need for more allocation of funds

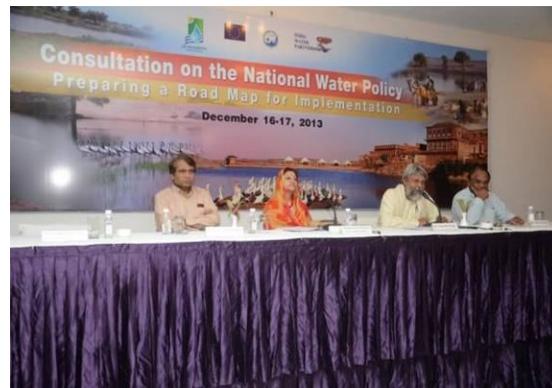
and regulations to efficiently manage existing infrastructure in order to bridge the gap between potential created and utilized.

Finally, he mentioned that there are many problems, solution cannot be 'a solution' but can be many alternatives. He gave his model of solution to the national water problems as follows:

First step: There are 6 lac revenue villages in the country and water has its own boundary. Demarcate water village rather than revenue/political/administrative boundary. This can be done by understanding the watershed and hydrological system and respect that as a water village boundary.

Second step: Water flows on land/soil so go far soil testing and based on that prepare cropping pattern plan. Prepare a integrated plan based on these two parameters and make a district plan.

Third step: The role of centre government, state government, district and people has to be defined and all have to work in a integrated manner. The rural development programs such as MNREGA can be dovetailed with water related works. A technical support group at water-village level and district level be provided. Encroachment of water bodies, rivers, etc. should be removed by water literacy campaigns. Go for water security first than food security, as food security cannot be ensured without water security. Enforce the principle of separation of river and sewer in order to save our rivers from contamination both surface and groundwater.



Vote of thanks

HH Maharani Hemlata Rajye, Trustee, Jal Bhagirathi Foundation proposed special thanks to Mr. Suresh Brabhu for delivering excellent talk and giving new model for water resource management in the country and also for sparing time to visit Jodhpur and also thanked other dignitary on the dais. She also proposed thanks to European Union and IWP-India for providing financial support for organising the consultation. Also thanked all the resource persons and

participants from the eight states, government line department officers and the office bearers of JBF and CEDSJ for participation and their cooperation in organizing the event successfully.

Issues for Developing a Road Map for North Zone States¹.

Based on the presentations in the consultation and group discussions some major issues relevant for preparing road map for the North Zone are listed below:

As there is considerable diversity within the North Zone, it is proposed to divide the zone into three sub Zones, namely Hill states, Gangetic plane and dry zone. It is therefore appropriate to first highlight the issues at the sub-zone level and then come up with Road Map of the main issues for the entire north zone.

Features of Sub-zones

The main features of the sub zones are briefly described below:

I. Hilly Region: This includes states of Jammu and Kashmir, Himachal and Uttrakhand. This region is a source of many perennial river fed by glaciers. These states share large international boundary and rivers flow across the countries. Transboundary issues of water sharing become important while planning water resources in the region. The rivers also pass through many states, therefore interstate sharing of water is also one of the major issues. As the rivers in this region are large in size and good water flow, numbers of Dam are constructed on them and those have become centre of conflict among stakeholders on different aspects of water resource management.

The rural population of these states is primarily dependent on agriculture but industries and urban townships have become major source of water pollution to the extent that the life of rivers is threatened. The energy and development nexus has led to construction of large number of

¹ North Zone includes the following states and union territories: Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Haryana, Punjab, Uttar Pradesh, Rajasthan and National Capital territory of Delhi and Chandigarh (Union territory).

hydro power projects in the fragile eco systems of Himalayas leading to many kinds of disasters. The nature of topography and geo-formation do not support the presently planned large number of major hydro power or infrastructure development projects in the region. The region has got comparative advantage in growing horticultural crops which are low water intensive, eco friendly, high value and employment generating.

Provision of drinking water security to people in the region is a big challenge mainly because of topography and scattered settlement pattern in the hilly areas.

The region has got surplus water supply but management is a big issue and water governance and regulatory issues were neglected in the past. It is the NWP-12 that made the hilly states aware about the water sector reforms and now the states are thinking of addressing them in their new water policy documents. Still J&K and Uttrakhand are much behind in visualizing the future water scenario. This is clearly evident as J&K even today has no water policy document and all actions are guided by the Jammu and Kashmir Water Resources (Regulation and Management) Act, 2010 and Rules SRO; 30, Jan.24, 2011.

Similarly, the proposed legal reforms to better manage water resources and to support water sector reforms as per the guideline of NWP-12 do not find the desired attention in the water policy of the other hilly states.

II. The Gangetic Plains: The states of Utter Pradesh, Punjab and Haryana and National Capital Territory (NCT) of Delhi are part of this region. Some parts of Uttrakhand also fall under this sub zone. The entire region is fed by perennial rivers flowing from the Himalayas, along with the fertile alluvial soil, that makes it so rich.

In case of Punjab there is more political consideration to water resource management than sustainable use of resource, for example, ground water is depleting fast yet there is free electricity to overexploit the resource. Green Revolution associated with intensive cultivation led to excessive exploitation of ground water for irrigation, in the states of Punjab and Haryana and parts of western Uttar Pradesh. The low water consuming crops like pulses and oil seeds were replaced with high yielding crop varieties (e.g. paddy, wheat & sugarcane) with greater demand for water for irrigation. The number of tube wells increased many fold. No doubt, intensive

agriculture practices led to increase in farmers' income but it has also resulted in receding ground water table. The rate of extraction of ground water has far exceeded the rate of replenishment leading to groundwater imbalance. IWRM approach do not find place in the policy.

The surface and ground water quality issue is common in all the states. None of the State Governments are serious about it despite the fact that health of people is seriously affected and Punjab is good case to quote where large numbers of people are suffering of cancer and many other water born diseases.

Encroachment of traditional water bodies, rivers and other streams is rampant affecting the flow in rivers and groundwater recharge in the region. Sand mining in rivers is affecting their contribution in the form of eco-system services to the society and nature and threatening the life of rivers. Uttar Pradesh has taken some serious measures to restore the village traditional water bodies but the large number in Punjab are being encroached or out of use.

Water sector reforms to improve water governance require institutional and legal reforms. Such reforms are proposed in the NWP-12 and the states falling in this region also agree to these but in terms of subsequent action the issue is put on low priority. Though UP government has passed the Water Regulatory Authority Act yet it is not practiced fully, for example free canal water and community tubewell water in the state has resulted in inefficient use of water resources in the state.

Interstate treaty on sharing of water between and among states in the region is a major issue to be resolved. The nature of disputes are of two type; first, disagreement over the share in total water and related dispute despite the decisions of Tribunals (the decision cannot be even questioned in the Supreme Court), and second, the shares were fixed by the Tribunals but the control/management of supply (distribution) is with one state or committee and water is not released at time when the partner states need it or not in accordance to the agreed quantity. Presently there is no satisfactory mechanism or institution to address the problem and all the states are confronting each other affecting the overall agriculture production in the region.

III. Dry Region: The State of Rajasthan and part of Haryana forms the third sub Zone. As this region receives inadequate rainfall, dry arid and semi arid conditions prevail in the state and therefore largely depend on interstate surface water supply from neighboring states.

Rajasthan is characterized by dry conditions and extensive shortage of water. Groundwater meets 90 percent of drinking and 60 percent of irrigation demand of the state. Therefore, sustainable management of ground water is a major challenge. The water table has fallen fast in rural and urban areas due to over exploitation of GW for agriculture and domestic use to the extent that only 13 percent of the Groundwater blocks are in safe category and that too either because of brackish groundwater or water logged areas in the canal commands.

Increasing urbanization leading to higher demand for water supply with only two out of 14 River Basins reporting surplus water throw bigger challenge to meet the urban water demand.

The other problems in the region are common as of the other two zones in the Northern Region such as, interstate sharing of water, encroachment of water bodies, pollution of rivers, etc. are also evident in this zone. The Rajasthan State has a very progressive State Water Policy and also gone much ahead than other states in the region in water sector reforms, for example pilot IWRM plans for large number of Gram Panchayats', comprehensive Water Bill, Water Regulatory Authority, etc. have been implemented in the state.

The Road Map

The emerging water issues in the North Zone are: Interstate water sharing and conflicts, Environmental flow in the rivers, damming the rivers in Himalaya, river water pollution, Intensive agriculture and depletion of GW, urban area water crisis, prioritizing allocation of water, depletion of GW in Urban areas, sewage disposal and treatment, water depletion and contamination, water logging and salinity, unequal access to water, etc. The position taken by the group on each of the issues and suggested Road Map is as follows;

Water Sector Legal Reforms

Since Independence in the Northern States of India no attempts were made to review water related laws despite large number of water conflicts in the region at all levels, i.e. village to state and interstate levels. As a part of water sector reforms governance issues need redressal and legal reforms become essential. As per the NWP-12 there is a need for comprehensive legislation for optimum development of inter-State rivers and river valleys to facilitate inter-State coordination ensuring scientific planning of land and water resources taking basin/sub-basin as unit with unified perspectives of water in all its forms (including precipitation, soil moisture, ground and surface water) and ensuring holistic and balanced development of both the catchment and the command areas. Such legislation needs, inter alia, to deal with and enable establishment of basin authorities, comprising party States, with appropriate powers to plan, manage and regulate utilization of water resource in the basins.

This issue was discussed and need for legal reforms were supported by most participants. However, the experiences shared by few states participants were not very encouraging. Rajasthan State made an effort to prepare comprehensive water Bill and circulated for stakeholders' discussion. Based on the state experience it was felt that there is need for some changes in the process of preparing such document and that is create a state level think tank and also appoint a group of experts to review existing States Acts on water and suggest amendments / modifications or reformulation required to attain the goal set in the sector reforms. The draft document be widely circulated and debated in district level stakeholder meetings/workshops and based on the suggestions the bill be finalized.

Lack of farmers' participation in the irrigation management was considered to be the main reason for the gap between irrigation potential created and utilization in the country. As a remedy to the problem Participatory Irrigation Management Act (PIM) was prepared and was adopted in most of the States. Review of impact of PIM Act and implementation experiences shows that there are many gaps. Participants highlighted those gaps in their states and suggested to bring out a new version of Participatory Irrigation Management Act – model bill, circulate it to all the

states and based on the inputs on that seek amendments to existing Participatory Irrigation Management Acts.

Uses of Water

On the issue of prioritizing water uses it was first time that in NWP-12 outright listing of priorities was avoided and only mention is made of water uses. This has created doubt in the minds of civil society organizations, researchers and public at large that state wants to favour industry at the cost of drinking water security and food security. The participants were unanimous in suggesting that the Centre, States and local bodies (governance institutions) must ensure access to a minimum quantity of potable water for essential health and hygiene to all its citizens, available within easy reach of the household. Also to ensure food security to people agricultural use of water be given second priority. The issue of environmental flow, the need for minimum environmental flow in all the rivers be maintained and then only allocation of water be made for other uses.

Ecological needs of the river should be determined, through scientific study, recognizing that the natural river flows are characterized by low or no flows, small floods (freshets), large floods, etc., and should accommodate developmental needs. A portion of river flows should be kept aside to meet ecological needs ensuring that the low and high flow releases are proportional to the natural flow regime, including base flow contribution in the low flow season through regulated ground water use.

Need was expressed for development of guidelines on efficient and optimum use of water in domestic, agricultural, and industrial purposes. Also need for preparation of water security plans and evolution of norms for ecological flow determination through scientific study adopting international best practices.

Enhancing water available for use the NWP-12 suggests that declining ground water levels in over-exploited areas need to be arrested by introducing improved technologies of water use, incentivizing efficient water use and encouraging community based management of aquifers. In

addition, where ever necessary, artificial recharging projects should be undertaken so that extraction is less than the recharge. This would allow the aquifers to provide base flows to the surface system, and maintain ecology. This view point was endorsed by the group.

Water Management: Demand side

In order to bridge the gap between supply and demand for water appropriate pricing of water is considered to be one of the tools. In this regard NWP-12 suggests that pricing of water should ensure its efficient use and reward conservation. Equitable access to water for all and its fair pricing, for drinking and other uses such as sanitation, agricultural and industrial, should be arrived at through independent statutory Water Regulatory Authority, set up by each State, after wide ranging consultation with all stakeholders.

In order to meet equity, efficiency and economic principles, the water charges should preferably, as a rule be determined on volumetric basis. Such charges should be reviewed periodically. Recycle and reuse of water, after treatment to specified standards, should also be incentivized through a properly planned tariff system.

Agreeing to the above policy prescription the group reiterated the stand taken by the civil society organisation that water cannot be treated as commodity it is a 'Resource' and more than that life of all living beings, therefore, while pricing it, a minimum amount (may be equal to the biological and sanitation need) be given free to all people and rest can be priced but do not allow rich people or industry to monopolize its use, i.e., ensuring equity and access to poor section of the society.

The proposition of formulation of Water Regulatory Authority was strongly pursued by the national government by incentivizing the state's formulating such authority. Most of the Northern State governments agreed to it and put in their policy documents and few formulated the Water Regulatory Authority. However, their performance and results are not visible. It is mainly because States have unilaterally accepted it without debating on it or sharing it with the different stakeholders and public at large.

The participant in the consultation though agreed to the need for such organisation but expressed their reservation on account of the composition of the WR Authority and its functioning as even the Water Resource Department or Irrigation Department is not able to use the existing legal provisions efficiently to manage the water resources. They expressed need to relook over the composition and authority of such institution assigned a very controversial subject to deal with. The group proposed more and wider public debate on the issue.

On **water supply and sanitation** the NWP-12 suggests that urban and rural domestic water supply should preferably be from surface water in conjunction with groundwater and rainwater. Where alternate supplies are available, a source with better reliability and quality needs to be assigned to domestic water supply. Exchange of sources between uses, giving preference to domestic water supply should be possible. Also, reuse of urban water effluents from kitchens and bathrooms, after primary treatment, in flush toilets should be encouraged, ensuring no human contact.

The Group was of the view that major problem of urban areas is that their water demand cannot be met from local surface or groundwater sources hence they have to depend on bulk transfer of water from outside, consequently denying share of rural population. Urban population being politically strong does not want even to pay for water transport/transfer costs and also no compensation to the rural population affected by the transfer of water. Further the urban water is so mismanaged that distribution losses account for more than 40 percent. Also urban population do not take initiative to recharge groundwater by adopting roof top rainwater harvesting despite such law promulgated by some of the States.

Therefore, the group suggested action is; in urban and industrial areas, rainwater harvesting wherever techno-economically feasible, should be encouraged to increase availability of utilizable water. Implementation of rainwater harvesting should include scientific monitoring of parameters like hydrogeology, groundwater contamination, and pollution. Urban water supply and sewage treatment schemes should be integrated and executed simultaneously. The utilization

of treated water should also be planned and in that agriculture use can be given priority over other uses.

Industries in water short regions may be allowed to either withdraw only the makeup water or should have an obligation to return treated effluent to a specified standard back to the hydrologic system. Tendencies to unnecessarily use more water within the plant to avoid treatment or to pollute ground water need to be prevented. Recycling of water be made compulsory norm in all industries.

In the Northern States, so far industries have been evading the environmental laws, directives and polluting surface and groundwater and Rivers in the region. There is a need to call for a round table with major water consuming industries to do brainstorming on the road map to make recycling the norm and to identify policy options and appoint an effective monitoring group/system and initiation of follow up actions.

River Rejuvenation

Save India's Rivers is a big issue and on this the NWP-12 suggests that conservation of rivers, river corridors, water bodies and infrastructure should be undertaken in a scientifically planned manner through community participation.

Encroachments and diversion of water bodies (like rivers, lakes, tanks, ponds, etc.) and drainage channels (irrigated area as well as urban area drainage) must not be allowed, and wherever it has taken place, it should be restored to the extent feasible and maintained properly. Environmental needs of Himalayan regions, aquatic eco-system, wet lands and embanked flood plains need to be recognized and taken into consideration while planning.

The group deliberated on the issue as this is the most common problem in all the Northern States and endorsed what was suggested by Mr. Rajendra Singh as the road map and that is as follows:

1. River Rejuvenation: Adoption of Integrated Water resource Management approach in all river basins, sub-basins and watersheds. It should be participatory and based on use of traditional and modern knowledge of water resource management.
2. Management of River: Community based river organization be formed. Governance of rivers should be completely transparent and participatory and managed by people by constituting an organization like River Arvari Parliament.
3. Clean Rivers (Pollution Free): No mixing of river & sewer/ effluents. Surface and ground water pollution by individual, group, community, industry or any other should be treated as criminal act and must have legal provisions for severe punishment and not penalties. River and Sewer mixing to be addressed in two ways; first, wherever possible and economically feasible don't allow sewer to be put without treatment in rivers or water bodies. Second, separate river and sewer and make arrangement of sewer use in agriculture after proper treatment. Ensure community participation in cleaning of rivers and water bodies. Also start in a big way awareness building of people on these issues.
4. Ensured Environmental flow: Balance has to be maintained between surface and groundwater use in all the river basins to check the alarming status of groundwater. The problem can be handled only by ensuring environmental flow in all rivers in the country.
5. Land of rivers: Demarcated base flow, flood plain, high flood plain for all major rivers in the country. Clear demarcation from head waters to ocean, defined as reserved areas based on last 100 years flood data. Community participation in identification of these areas should be ensured.
6. Creation of a national regulatory framework for protection of river corridors and establishment of buffer zones – River Zones Regulation notification under Environment Protection Act.
7. Prepare a regulatory framework to protect recharge zones for ground water in both rural and urban areas and upstream areas of reservoirs from undesirable construction activities and those activities that lead to pollution.

Water Sector Reforms

Water sector reforms were initiated by Donor agencies in the Nineties but were specifically brought in limelight in the NWP-12. There are three main components of Water Sector Reforms namely; infrastructure, institutional and legal. Under the legal and institutional reforms the three main institutions proposed in the NWP-12 are; River Basin Authorities, Water Regulatory Authorities in each states and Water Disputes Tribunal at Centre level. IWRM as the principle of water resource management and related institutional change at state level also form part of the reforms.

The group was of the view that there are many obstacles in operationalizing reforms and installing the proposed institutions, such as, need for constitutional amendment, building consensus among stakeholders, etc. Fundamentally, implementation of water sector reforms is possible only by setting up of River Basin Authorities in all the states and at the next level for all the major Rivers in the country. As a first step 'River Basin zones' need to be notified clearly by all the state governments defining the activities that are permissible and non-permissible and a national authority to be created to oversee the implementation of the regulations.

Water Conflict Resolution

As regards the conflict resolution the institution proposed in the NWP-12 is; a permanent Water Disputes Tribunal at the Centre should be established to resolve the disputes expeditiously in an equitable manner. Apart from using the "good offices" of the Union or the State Governments, as the case may be, the paths of arbitration and mediation may also to be tried in dispute resolution. Since large number of disputes at all levels was observed in the Northern States the Group endorsed the policy and suggested that the TOR for such institution should be based on the lessons learned from the River Dispute Resolving Tribunals in the past so that redressal is quick and less expensive.

Upstream and downstream water sharing disputes are common in the hills of Jammu and Kashmir, Uttrakhand and Himachal Pradesh. Sharing of water between Haryana, Punjab and Rajasthan and second, sharing of Ganga water between U.P Haryana and Delhi, are the most

visible interstate water sharing conflicts. Conflicts arising out of sharing water between urban and rural areas are also common in all the states in Northern Region.

The crisis in a metro city like Delhi is precipitated due to extensive development activity, urbanization, in-migration and industrialization leading to water scarcity and pollution of ground water. Besides, the river water of Yamuna, the life line of Delhi is highly polluted due to untreated sewer water being put in to it. Growth in slums has led to aggravation of sanitation problems. Thus, conflict due to unequal access to water by slum and non-slum population also gets reflected in the tug of war on inter-state sharing of river water.

The action required to deal with intra-state water conflicts constitute a Forum at State level for resolution of intra-State conflicts among different users of water. Establish permanent water dispute tribunal - amendment of Inter-State Water Disputes Act 1956.

Implementation of IWRM

The next reform proposed is linked to the adoption of Integrated Water Resources Management (IWRM) as main principle for planning, development and management of water resources taking river basin/sub-basin as a unit. It entails restructuring of the departments/organizations at Centre/State Governments levels and they be made multi-disciplinary accordingly. Restructure water resources departments of State Governments to make them multi-disciplinary focused on Integrated Water Resources Management, which most states have failed to do so for inter departmental conflicts and power sharing. The experience in implementation of IWRM is not very encouraging in any of the Northern States mainly because of lack of political will. Technocrats are also not willing to accept this change for their narrow interest. But the group reemphasized the need for IWRM approach and suggested a committee of all the stakeholders be set up to come out with pragmatic recommendations for its early implementation.

Appropriate institutional arrangements for each river basin should be developed to collect and collate all data on regular basis with regard to rainfall, river flows, area irrigated by crops and by source, utilizations for various uses by both surface and ground water and to publish water

accounts on daily basis every year for each river basin with appropriate water budgets and water accounts based on the hydrologic balances. In addition, water budgeting and water accounting should be carried out for each aquifers.

Appropriate institutional arrangements for each river basin should also be developed for monitoring water quality in both surface and ground waters rather monitoring of water quality to be made a statutory requirement through river basin legislation. Promote community action in reducing pollution load of rivers, lakes and other water bodies. Participation of local communities to watch the activities causing pollution of rivers, streams, lakes and water bodies can be ensured only by setting up of Technical Support Group at Taluka level to build capacity of people on water issues.

There is a need to prepare a Draft River Basin Management Bill based on feedback received through consultation with all stakeholders including national and regional workshops. Same exercise has to be performed for creation of other proposed institutions so to make them acceptable to all the stakeholders.

Preparation of River Basin Master Plans on Integrated Water Resource Management principles to meet inter-alia the needs of all for drinking water, sanitation and livelihood activities and ecological flows of the river.

Groundwater

Groundwater, though part of hydrological cycle and a community resource, is still perceived as an individual property and is exploited inequitably and without any consideration to its sustainability leading to its over-exploitation in several areas. Mapping of the aquifer system in the country (National Aquifer Mapping Programme already launched) and development of models for community based ground water management. Development of models for community based ground water management.

In order to reduce pressure on groundwater make agriculture more water efficient through appropriate cropping technology and better land-water management to match water endowments. Writing to all States to limit free electricity to a minimum slab beyond which electricity will be charged to conserve water for survival of human being and ecosystem.

Aquifers to be mapped and managed with community participation and come out with regulatory system in over exploited areas to strengthen with community participation as is tried in Rajasthan. Map the aquifer system in the country - National Aquifer Mapping Programme already launched and Rajasthan is first state to complete the mapping of all its aquifers. Promote new ground water regulation bills among the States with management of groundwater resting with community.

Launching of a scheme in convergence in the Mahatma Gandhi National Rural Employment Guarantee Scheme to identify recharge zones, constructing recharge structures and protection of ground water recharge zones through appropriate directions from Central Ground Water Authority.

Surface water pollution, Ground Water Depletion and Contamination: The quality of ground water has become immensely polluted in a number of areas in Haryana, Punjab and also in some parts of Uttar Pradesh, due to intensive use of chemicals in agriculture (fertilizer, pesticides, etc.). Also the problem of excessive fluorides in groundwater mainly because of over exploitation has emerged in Rajasthan. The problem can be checked by way of formulating massive action plan for groundwater recharge and one such plan is prepared for the western districts of Rajasthan.

The price policy of electricity used in tube-wells lifting ground water aggravates over-extraction of ground water (in Punjab states the electricity charges are either zero or too low in UP surface and Community Tubewell water is free of charge) and this be discouraged. The issues in development, utilization and management of surface and ground water are too complicated as they are being politicized rather than based on rational economic and environmental concerns.

There is strong need to build pro water resource perspective of the politicians and decision makers by organizing capacity building discourses in each state.

River Pollution

Lack of sewage treatment is leading to river pollution. The bacteriological and chemical pollution of drinking water sources and increased natural contamination risk such as fluoride, arsenic, iron, and salts are increasing in the ground water that make it unfit for drinking purpose, posing a serious health hazard.

Action: All the states in the region have to come together and prepare a plan on how to save the rivers in the zone. Identify the point and use source of pollution and plan for control at both levels in an integrated way. Plan in a big way as how to separate sewer and river by treating the polluted water and utilize it in agriculture keeping community participation in the centre of the plan.

Water logging and Salinity

In the absence of inadequate drainage, seepage from unlined canals and over watering of the fields leads to water logging. Water logging and salinization pose a real threat to fertility of soil/environment in some parts of Punjab, Haryana and Rajasthan (IGNP command area) in where it has resulted in rise in water table.

Number of other water issues that could not be addressed in the consultation may be taken up in such consultation to be organised in other parts of the country. While organizing such consultation there is a need to take care that the zonal vision exercise is consistent and in harmony with the overall national level Water Road Map.

APPENDIX I
Consultation Program

**Consultation on the National Water Policy - Preparing a Road Map for
Implementation
16th & 17th December 2013**

Venue: Jal Bhagirathi Foundation, Near Kayalana Lake, Bijolai – Jodhpur

AGENDA December 16, 2013

| | | |
|-----------------------|---------------------------------------|---|
| 4.00 – 6.00 PM | Inaugural Session I | |
| 4.00 - 4.30 PM | | Registration |
| 4.30 - 4.40 PM | Inaugural Address | HH Maharaja Gaj Singh, Chairperson, Jal Bhagirathi Foundation |
| 4.40 – 4.55 PM | Consultation Context and Structure | Dr. M. S Rathore, Director, CEDSJ |
| 4.55 – 5.05 PM | Special Address | Mr. O.P. Sharma, Country Director, Wells For India |
| 5.05 – 5.15 PM | Special Address | Mr. Kishan Singh Jasol, President, Jal Sabha Jasol, Barmer |
| 5.15 – 5.25 PM | Special Address | Dr. Pankaj Bhardwaj, Assistant Professor, All India Institute of Medical Sciences |
| 5.25 – 5.35 PM | Special Address | Dr. M.M. Roy, Director, CAZRI |
| 5.35- 5.50 PM | Theme Address | Dr. A. C. Tyagi, Secretary General, ICID |
| 5.50 – 6.00 PM | Concluding Remarks | Ms. Kanupriya Harish, Trustee, Jal Bhagirathi Foundation |
| 6.00- 7.00 PM | | High Tea |

December 17, 2013

**9.00 – 11.00 AM Session II: State Issues of UP, Punjab, Delhi and Haryana in context of the
New National Water Policy**

| | | |
|-----------------|---|--|
| 9.00 – 9.20.AM | Introductory comments and Opening Remarks | Chair: Mahendra Mehta, Deputy Team Leader, EU SSP |
| 9.20 - 9.40 AM | Presentation from Uttar Pradesh in context of the New National Water Policy | Shri. Ishwar Chand Agarwal, Chief Engineer Water Resource Department |
| 9.40 - 10.00 AM | Presentation from Delhi in context of the New National Water Policy | Dr. Hardeep Singh, SPWD, Delhi |

10.00- 10.30 AM Discussion/Clarification
Tea Break

10.30–11.00 AM

11.00 – 01.00 PM Session III: State Issues of Rajasthan, HP, J&K and Uttrakhand in the context of New National Water Policy

11.00 - 11.15 AM Introductory comments and Opening Remarks Chair: Dr. Goutam Sadhu, Dean, IIHMR

11.15 - 11.30 AM Presentation from Rajasthan in context of the New National Water Policy Shri. Pradeep Mathur Chief Engineer, SWRPD

11.30 - 11.45 PM Presentation from Uttarakhand in context of the New National Water Policy Shri. Prashant Bishnoi SE Planning

11.45 - 12.00 PM Presentation from Uttarakhand in context of the New National Water Policy Shri. Suresh Bhai, Himalaya Paryavaran Shiksha Sansthan

12.00 – 12.15 PM Presentation from Jammu & Kashmir in context of the New National Water Policy Shri Ramesh Chandra Sharma, Paryavaran Kutir

12.15 – 12.30 PM Discussion/Clarification

12.30 - 12.45 PM Summing Up and comments by the Chairs Shri. Mehandra Mehta & Dr. Goutam Sadhu

12.45-1.00 PM Group Formation and issues for discussion Dr. M. S. Rathore, Director, CEDSJ

01.00-02.00 PM Lunch Break

2.00 – 3.00 PM Session IV: Road Map and Action Plan

2.00 - 2.15 PM Comments and address by the Chair Chair: Dr. Pradeep Bhagrava, Director, G.B. Pant Institute of Social Science

2.15 – 2.45 PM Group Discussion

2.45 - 3.00 PM Group Presentation Group I and Group II Group III Group Leaders: Dr. Pradeep Bhagrava Dr. Goutam Sadhu Shri. Mehandra Mehta

3.00-3.30 PM Tea Break

3.30 – 5.00 PM Session V: Valedictory Session

3.30 - 3.45 PM Special Address Shri. Chakravarti Singh, President, Jal Parishad

3.45 - 4.00 PM Theme Address Dr. Varun Arya, Director, Aravali Institute of Management, Jodhpur

4.00 – 4.15 PM Special Address Dr. T.S. Rathore, Director, Arid Forest Research Institute, Jodhpur

4.15 – 4.35 PM Chief Guest Address Shri. Suresh Prabhu, Former

4.35 – 4.50 PM

Valedictory remarks

Cabinet Minister, Government of
India

Shri Rajendra Singh, Vice
Chairman, Jal Bhagirathi
Foundation

4.50 – 5.00 PM

Vote of Thanks

HH Maharani Hemlata Rajye,
Trustee, Jal Bhagirathi
Foundation.

APPENDIX II

List of Participants - Jodhpur consultation December 16-17, 2013

| S. No. | Name | Designation | Organisation | Address | Registration Date | Contact No |
|--|------------------------|---|---|---|-------------------|------------|
| Participants from developmental organisations | | | | | | |
| 1 | Dr. Jagdish K. Purohit | Program Director | Society for Promotion of wastelands Development | 26-27 mahaveer colony, bedla road, udaipur | 17.12.2013 | 9983333670 |
| 2 | Ganesh Purohit | Director | Jagaran Jan Vikas Samiti | Sapetia Road, BEDLA, Udaipur | 17.12.2013 | 9928816225 |
| 3 | Anup K. Shirvastava | | Parmarth Sansthan | Orai, U.P. | 17.12.2013 | 9868639942 |
| 4 | Nathu Dan Charan | | Kisan Paryavaran Sangharsh Samiti | Gudhwara, Rahat, Pali | 17.12.2013 | 8107806115 |
| 5 | Avinash Chand Tyagi | Secretary General | ICID | 48, Nyaya Marg, Chanakyapuri New Delhi | 16.12.2013 | |
| 6 | Ajay Kumar Kalla | Retd. Chief Technical Officer | CAZRI Jodhpur | B 36, UIT Pratap Nagar | 16.12.2013 | 9414475120 |
| 7 | Hanwant Singh Panwar | Retd Chief Technical Officer Horticulture | CAZRI Jodhpur | Mansagar, near muni maharaj temple, mahamandir, Jodhpur | 16.12.2013 | 9680515539 |
| 8 | Hardeep Singh | Program Director | Society for Promotion of wastelands Development | 14-A vishnu digambar marg, New Delhi | 16.12.2013 | 9313949329 |
| 9 | Manish Vaishnav | Accountant | VIMO SEWA | 11/841 C. H. B. Jodhpur | 16.12.2013 | 9214664912 |

| | | | | | | |
|----|-------------------------|-----------------------|------------------------------------|---|------------|------------|
| 10 | Rekha Vaishnav | State Coordinator | VIMO SEWA | 11/841 C. H. B. Jodhpur | 16.12.2013 | 9214664912 |
| 11 | R. C. Sharma | Scientist Retd. | Paryavarn Kutir | 619 Pocket I Mayapuri, Delhi | 16.12.2013 | 9971799818 |
| 12 | Alka Purohit | Super U | SEWA SANSTHAN | 11/841 C H B | 16.12.2013 | 9414474555 |
| 13 | Jayendra Singh Chawada | Supervisor | Mahila Housing Sewa Trust | 11/841 C H B | 16.12.2013 | 9261280232 |
| 14 | B. K. Sharma | Regional Team Leader | Foundation for Ecological Security | 2F16, R C Viyas Colony, Bhilwara | 16.12.2013 | 9413316130 |
| 15 | Akshay Mathur | Unit Head | CECOEDECON | 158-159 Sitapura Jaipur | 16.12.2013 | 9460053042 |
| 16 | Praveen Jain | Engineer (WRM) | Ambuja Cement Fouddation | Ambuja Cement Foundation, Near Shopping complex, Rabniyawas | 16.12.2013 | 9829513332 |
| 17 | Gaurav Khandelwal | Project Officer (WRM) | Ambuja Cement Fouddation | Opposite railway station, Marwar Mundwa | 16.12.2013 | 9829770766 |
| 18 | Anil Sampatrao Patil | Chairman | Maharastra Vikas Kendra Pune | | 16.12.2013 | 9822860487 |
| 19 | Pukhraj Patel | Director | Kisan Paryavaran Sangharsh Samiti | Pali | 17.12.2013 | 9414308080 |
| 20 | Mahaveer Singh Sukarlai | General Secretary | Kisan Paryavaran Sangharsh Samiti | pali | 17.12.2013 | 9414615221 |
| 21 | Ganga Dan Charan | Vice Chairmain | Kisan Paryavaran Sangharsh Samiti | pali | 17.12.2013 | 9166675656 |
| 22 | Suresh Bhai | | HPSS Uttarakhand | Matli Uttarakhand | 16.12.2013 | 9412077896 |

| | | | | | | |
|----|-----------------------|-------------------------|--|-----------------------------------|------------|------------|
| | | | | 24193 | | |
| 23 | Mavlik Sisodia | | Tarun Bharat Sangh | | | |
| 24 | Narendra Pratap Singh | S.R.O. | CEDS Jaipur | B 92 Nitya nand Nagar, jaipur | 16.12.2013 | 9414516630 |
| 25 | Ladu Lal Sharma | Senior Research Officer | CEDS Jaipur | B 92 Nitya nand Nagar, jaipur | 16.12.2013 | 9314448864 |
| 26 | Dilip Singh Bedawat | Program Officer | UNNATI Sansthan | Near Laheriya Resort, Jodhpur | 16.12.2013 | 9460000150 |
| 27 | Sumit Singh | Regional Director | All India Institute of Local Self Governance | Baldev Nagar, Jodhpur | 17.12.2013 | 7742824444 |
| 28 | Gajendra Singh | Research Officer | All India Institute of Local Self Governance | Baldev Nagar, Jodhpur | 17.12.2013 | 7742824444 |
| 29 | Mahendra Mehta | DTL EIS SPP | EGIS | 21 Vishnupuri, jaipur | 16.12.2013 | 9460248911 |
| 30 | Deepak Agarwal | regional Head | AXIS Bank | Jodhpur | 16.12.2013 | 9929599298 |
| 31 | O. P. Sharma | Country Director | Wells for India | Udaipur | 16.12.2013 | 9828043406 |
| 32 | Deepti Sharma | Research Scholar | Wells for India | Panerion K P Madri Udaipur | 16.12.2013 | 9460342583 |
| 33 | Arvind Ojha | Secretary | URMUL TRUST | Near Roadways, Bus stand, Bikaner | 17.12.2013 | 9414137093 |

Participants from Research Organisations

| | | | | | | |
|----|---------------|------------------------|--------------------------------|---|------------|------------|
| 34 | Babita Mishra | Research Scholar | Arid Forest Research Institute | 15 Scientist hostel, AFRI New pali road | 17.12.2013 | 9982024066 |
| 35 | Dr. N. Bala | Scientist E & Head FED | Arid Forest Research Institute | AFRI Jodhpur | 17.12.2013 | 9829890490 |

| | | | | | | |
|----|-----------------|---------------------------|--|-----------------------|------------|------------|
| 36 | Lovelesh | JRF | Arid Forest Research Institute | AFRI Jodhpur | 17.12.2013 | 9530458335 |
| 37 | Hema Singhal | CSIR- SRF | Arid Forest Research Institute | AFRI Jodhpur | 17.12.2013 | 9252460422 |
| 38 | Likhmi Meena | senior research scholar | Department of Philosophy, JNVU Jodhpur | JNVU Jodhpur | 17.12.2013 | 9414905800 |
| 39 | Dr. M M Roy | Director CAZRI | CAZRI Jodhpur | | 16.12.2013 | 9414025601 |
| 40 | Dr. R. K. Goyal | Principal Scientist | CAZRI Jodhpur | CAZRI Campus Jodhpur | 16.12.2013 | 9414410251 |
| 41 | Jhanwar Ram | Research Scholar | Department of Philosophy, JNVU Jodhpur | JNVU Jodhpur | 17.12.2013 | 9782422705 |
| 42 | Sophie Gove | Intern, CSE Delhi | CSE Delhi | | 16.12.2013 | 9971986384 |
| 43 | B Manasa Devi | research Scientist | RRSC West ISRO | 23/22 CHB, Jodhpur | 16.12.2013 | 7737679568 |
| 44 | Divya Mishra | research Scientist | RRSC West ISRO | CAZRI Campus Jodhpur | 16.12.2013 | 8107985887 |
| 45 | Dr. T. K. bhati | Principal Scientist Retd. | CAZRI Jodhpur | 15/143 C.H.B. Jodhpur | 16.12.2013 | 946008278 |

Participants from Government Departments

| | | | | | | |
|----|------------------|--------------------|---|----------------------------|------------|------------|
| 46 | Sanjeev Jain | Executive Engineer | Irrigation Dept. Uttarakhand | Project Division, Dehradun | 17.12.2013 | 9412312479 |
| 47 | Prashant Vishnoi | Executive Engineer | Irrigation Dept. Uttarakhand | Project Division, Dehradun | 17.12.2013 | 9410539713 |
| 48 | Pradeep Mathur | Chief Engineer | State Water Resources Planning Department, Jaipur | JLN Marg, Jaipur | 17.12.2013 | 9828129903 |

| | | | | | | |
|----|----------------------------|---------------------------|---|---|------------|------------|
| 49 | Pramod Kumar Verma | Assitant Hydrologist | Central Ground Water Board | Ist Polo, Paota Jodhpur | 17.12.2013 | 9414059128 |
| 50 | Gopal Singh Bhati | Additional Chief Engineer | PHED | Basni, Jodhpur | 17.12.2013 | 9929322277 |
| 51 | Dr. Prahalad Singh Rathore | Hydrogeologist | Ground Water Department, Jodhpur | 249 Marg 29, ISA, BJS Colony, Jodhpur | 16.12.2013 | 9413250418 |
| 52 | narendra Kumar Meena | Chief Engineer | Ground Water Department, Jodhpur | Opp. Hindustan Radiators, Jodhpur | 16.12.2013 | 9414266316 |
| 53 | Dr. Vimal Soni | Senior Hydrologist | Ground Water Department, Jodhpur | New Power House Road, Jodhpur | 16.12.2013 | 9314724256 |
| 54 | B. C. Mathur | Chief Engineer (Retd.) | PHED | A-14 II EXE K N Nagar Jodhpur | 16.12.2013 | - |
| 55 | Dr. Gautam Kumar Lalwani | HOD, Civil Engineering | M B M Engineering College | G 186 Shastri Nagar, Jodhpur | 16.12.2013 | 9414135186 |
| 56 | Dr. Anil Vyas | HOD Chemical Engineering | M B M Engineering College | 4/ B Sector 2, University Staff colony, Jodhpur | 16.12.2013 | 9462488089 |
| 57 | Govind Lal Bohra | Hydrologist Retd | Central Ground Water Board | 3-2-18 Kudi housing Board, Jodhpur | 16.12.2013 | 9414358189 |
| 58 | Dr. Pankaj Bhardwaj | Assitant Professor | AIIMS | | 16.12.2013 | 8003996903 |
| 59 | Gaj Singh Goyal | Law Officer | Rajasthan State Pollution Control Board | H No 122 Guljar Nagar, Bhadwasia, Jodhpur | 16.12.2013 | 9414136806 |
| 60 | B.R. panwar | Regional Officer | Rajasthan State Pollution Control Board | SPL 2 MIA basni, Jodhpur | 16.12.2013 | 9414147785 |

| | | | | | | |
|----|------------------|------------------------------|----------------------------------|---------------------------------------|------------|------------|
| 61 | I A Mughal | Chief Conservator of Forests | Forest Department | Van Bhawan New Pali Road Jodhpur | 16.12.2013 | 9414130032 |
| 62 | O .P. Poonia | Officer Inchange | Central Ground Water Board | 64 Polo I Jodhpur | 16.12.2013 | 9414720505 |
| 63 | Rama Kishan | Scientist | Central Ground Water Board | 6 A Jhala Doongari Jaipur | 16.12.2013 | 9413965305 |
| 64 | Ishwar Chandra | Chief Engineer | U.P. Irrigation Lucknow | Lucknow | 16.12.2013 | 9411502026 |
| 65 | Hanif Khan Goran | Sr. Hrdrogeologist | Ground Water Department, Jodhpur | 249 Marg 29, ISA, BJS Colony, Jodhpur | 16.12.2013 | 9414346429 |

Participants from Media & News Channel

| | | | | | | |
|----|------------------------|--------------------|------------------|--------------------------------------|------------|------------|
| 66 | Rajendra Sankhla | Reporter | 24 News | Paota, Manji ka hatta, Jodhpur | 17.12.2013 | 9929912650 |
| 67 | Anil Kothari | State President | Shiv Sena | F-305 Road No 7, MIA, Basni, Jodhpur | 17.12.2013 | 9829024317 |
| 68 | Dr. Santosh Kumar Dave | Reporter | Rajasthan Abha | | 17.12.2013 | 9414294789 |
| 69 | Dr. Yogesh Sharma | Reporter | Daily Jaltedeeep | Chandra Villas, Jodhpur | 17.12.2013 | 9829283812 |
| 70 | Ashiwini Vyas | Press Photographer | Jalte Deep | Paota, Manji ka hatta, Jodhpur | 17.12.2013 | 9828579100 |
| 71 | Manish Sharma | Photographer | | | | 9828150724 |

Participants from Academic Institutes

| | | | | | | |
|----|------------------|-----------------|-----------------------|--------------|------------|------------|
| 72 | Dr. S. C. Mathur | Professor & HOD | Department of Geology | JNVU Jodhpur | 16.12.2013 | 9460587817 |
|----|------------------|-----------------|-----------------------|--------------|------------|------------|

| | | | | | | |
|----|------------------------|--------------------------------|---------------------------------------|-----------------------------------|------------|------------|
| 73 | Vivek | Assistant Professor | | JNVU Jodhpur | 16.12.2013 | 9413236255 |
| 74 | Gaurav Kumar Jain | Assistant Professor | Department of Geography | JNVU Jodhpur | 16.12.2013 | 8947800366 |
| 75 | Dr. Lalit Singh Jhala | Assistant Professor | Department of Geography | JNVU Jodhpur | 16.12.2013 | 9460057843 |
| 76 | Dr. Praveen Gehlot | Associate Professor | | JNVU Jodhpur | 16.12.2013 | 9414701280 |
| 77 | Aapreksha Arya | Faculty | Aravali Institute of Management | Kaparda | 16.12.2013 | 9413319912 |
| 78 | Dr. Hukam Singh Gehlot | Professor & HOD | Department of Botany, JNVu | JNVU Jodhpur | 16.12.2013 | 9414124939 |
| 79 | Dr. Nisha Tak | Assistant Professor | Department of Botany, JNVu | JNVU Jodhpur | 16.12.2013 | 9461212680 |
| 80 | Om Prakash Rajpurohit | Assitant Professor | Department of Geography, JNVU Jodhpur | JNVU Jodhpur | 16.12.2013 | 9461192241 |
| 81 | Dr. Rajendra Parihar | Associate Professor & Ex. Head | Department of Geography, JNVU Jodhpur | JNVU Jodhpur | 16.12.2013 | 9414921189 |
| 82 | Dr. Gautam Sadhu | Associate Professor & Dean | IIHMR | IPD marg Sanaganer Airport Jaipur | 16.12.2013 | 8107777867 |
| 83 | Pradeep Bhargava | Director | G. B. Pant Social Science Institute | jhunsi, Allahabad | 16.12.2013 | 9415237820 |

Students

| | | | | | | |
|----|---------------|------------------|-----------------|--|------------|------------|
| 84 | Jagdish Dangi | M Sc Pre Geology | JNVU New Campus | 206 D, Krishan Temple, 3rd Street, BGKT, Jodhpur | 17.12.2013 | 9166413965 |
|----|---------------|------------------|-----------------|--|------------|------------|

| | | | | | | |
|----|----------------------|-------------------------|------------------|---|------------|------------|
| 85 | Rahul Panwar | M Sc Pre Geology | JNVU New Campus | 206 D, Krishan Temple, 3rd Street, BGKT, Jodhpur | 17.12.2013 | 8094960534 |
| 86 | Mukesh Bhadiyar | M Sc Pre Geology | JNVU New Campus | A-35, mangal bhawan, airforce road, pili tanki, BGKT, Jodhpur | 17.12.2013 | 9782659219 |
| 87 | Mahendra Morya | M Sc Pre Geology | JNVU New Campus | 206 D, Krishan Temple, 3rd Street, BGKT, Jodhpur | 17.12.2013 | 9807137305 |
| 88 | Deepak Yadav | M Sc Pre Geology | JNVU New Campus | 142, Vijay Nagar, Bsani Ist Phase, Jodhpur | 17.12.2013 | 8104532134 |
| 89 | Nikhil Ghamman | M Sc Pre Geology | JNVU New Campus | 258 B, BHK, Jodhpur | 17.12.2013 | 8384981909 |
| 90 | Ritu Kachchhal | M Sc Pre Geology | JNVU New Campus | P G Girls Hostel | 17.12.2013 | 8561875184 |
| 91 | Jaishree | M Sc Pre Geology | JNVU New Campus | 1/A/412 K B H B | 17.12.2013 | 9855308024 |
| 92 | Kumbha Ram | MA Pre Geography | JNVU New Campus | JNVU New Campus | 17.12.2013 | 9769389757 |
| 93 | Subhash Bhadiyar | MA Pre Geography | JNVU New Campus | JNVU New Campus | 17.12.2013 | 9782080728 |
| 94 | Devendra Choudhary | M Sc Pre Geology | JNVU New Campus | 35 A Mangal Bhawan Airforce, BGKT, Jodhpur | 17.12.2013 | 8107357789 |
| 95 | Sunil Kumar Jangid | M Sc Pre Geology | JNVU New Campus | 16 Adharsh Colony, Jobner, Jaipur | 17.12.2013 | 9414390813 |
| 96 | Pratap Ram Choudhary | M. Tech Applied Geology | NIT Raipur, C.G. | 14-15 Ramnagar BJS Jodhpur | 17.12.2013 | 8560060645 |

| | | | | | | |
|-----|-----------------------|--------------|-----------------------|-----------------|------------|------------|
| 97 | Shiv Singh Rahore | Scholar | Department of Geology | JNVU New Campus | 16.12.2013 | 9828119000 |
| 98 | Madam Lal Borana | Scholar | Political Science | JNVU New Campus | 16.12.2013 | 9413460716 |
| 99 | Arjun | MSc Geology | JNVU New Campus | | 16.12.2013 | 7568283802 |
| 100 | rajendra Singh | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9460079029 |
| 101 | Anil Mundel | | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 7737874700 |
| 102 | Nihal Ram Sangwa | M Sc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9166911938 |
| 103 | Mahipal Singh Chauhan | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9680689997 |
| 104 | Ram Prashad | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9530276162 |
| 105 | Shravan Singh | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 8947978062 |
| 106 | Shishram Singh | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9694949044 |
| 107 | Bhupendra Kumar | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 7568423938 |
| 108 | Lakshya lalas | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9166217093 |
| 109 | Hukma Ram | MSc Geology | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9462276825 |

| | | | | | | |
|-----|----------------------|------------------|-----------------|---|------------|------------|
| 110 | Pawan Singh Patel | | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9782019292 |
| 111 | Abhimanyu Sharma | P hD Student | | 19 E/4 Chopasani Housing Board, Jodhpur | 16.12.2013 | 9414704884 |
| 112 | Jitendra Kuma Megwal | PhD Student | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 8003008138 |
| 113 | Kishan Kumar | | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 9024411339 |
| 114 | Prakash Garg | | JNVU New Campus | JNVU Jodhpur | 16.12.2013 | 7790966369 |
| 115 | Devika Kaul | Fashion Designer | | G 20, Krishna Marg, C Scheme, Jaipur | 16.12.2013 | 9828388000 |

Jal Bhagirathi Foundation

| | | | | | | |
|-----|--------------------------|------------------------|---------------------------|---|------------|------------|
| 116 | Chakravorty Singh | President Jal Parishad | Jal Bhagirathi Foundation | Rakhi Jojavar House 17 Ratanad, Jodhpur | 16.12.2013 | 9413031477 |
| 117 | Benjamin Shorofsky | Fullbright Scholar | JBF | Jasol | 16.12.2013 | |
| 118 | Dr. D. C. Joshi | Principal Scientist | Member jal Parishad | 7-A-66 CHB Jodhpur | 16.12.2013 | 9829339477 |
| 119 | Jasawant Singh Nathawat | Member jal Parishad | JBF | 53 B, Shakti Nagar, Jodhpur | 16.12.2013 | 9414130376 |
| 120 | Kishan Singh | President Jal Parishad | JBF | Rawalgadh P.O. Jasol | 16.12.2013 | 7597316911 |
| 121 | Kanupriya Harish | Project Director | JBF | JBF | 16.12.2013 | |
| 122 | Prithvi Raj Singh Rahore | Managing Trustee | JBF | JBF | 16.12.2013 | |
| 123 | HH Maharaja Gaj Singh | Chairman | JBF | JBF | 16.12.2013 | |

| | | | | | | |
|-----|---------------------------|--------------------|-----|-----|------------|--|
| 124 | HH Maharani Hemlata Rajye | Trustee | JBF | JBF | 16.12.2013 | |
| 125 | Mr. Rajendra Singh | Chairman | JBF | JBF | 16.12.2013 | |
| 126 | Naveen Mishra | Program Manager | JBF | JBF | 16.12.2013 | |
| 127 | Parikshig Singh Tomar | Program Specialist | JBF | JBF | 16.12.2013 | |
| 128 | Bharghu Var Jangid | Program Specialist | JBF | JBF | 16.12.2013 | |
| 129 | Varun Goyal | Media & HR | JBF | JBF | 16.12.2013 | |