Workshop on "Catch the Rain: Rain Water Harvesting and Artificial Recharge Structures for Water Conservation" held on 13th March 2020 in Scope Complex, New Delhi

National Water Mission **(NWM)** organized a workshop in New Delhi on 13 March, 2020 on Rain Water Harvesting Structures (RWHS) as a part of their "Catch the Rain' campaign. This workshop was organized to discuss about the various technical aspects of the RWHS suited to different agro-climatic and soil-substrata of the country.

Shri U P Singh, Secretary, DoWR, RD & GR,while addressing the inaugural session of the workshop emphasized the need to create mass awareness and involve the general public in order to add momentum to the campaign. He stressed on the decentralization in rain water harvesting campaign and the importance of groundwater recharge. Shri U P Singh said while the 5000 dams in the country hold anywhere around 250 BCM of water, the quantity of water stored in underground aquifers is about 400 BCM. Though the country receives 1,000 millimeter rainfall though its distribution is skewed.He said that it is a matter of concern that only 8% of rainfall is harnessed while the rest is wasted as runoff. He said even if we are able to save 10% of the total quantity of water consumed in agriculture, it will make a big difference since agriculture comprises 85–90% of water usage in the country. He also mentioned more than 500 traditional water bodies including wells have been revived in Udham Singh Nagar, Uttar Pradesh by utilizing MGNREGA resources and Corporate Social Responsibility funds.

Earlier, Shri Suneel Kumar Arora, Adviser (C&M), National Water Mission welcomed address and mentioned that conservation of water is more important as water cannot be created. Water is a need of an hour as from year 2001 to 2020 water availabilityhas been reduced from 1820 Billion Cubic Meter (BCM) to 1476 BCM that comes under water stressed situation. He shared his experience of water conservation through phrase "JalJeevanKaHaiAnmolRatan, Isis BachaneKaKaroAnmolJatan". We have to manage demand side and focus towards water conservation for making water available for future generation.

Setting the Theme

Shri G. Asok Kumar, Additional Secretary & Mission Director said the campaign "Catch The Rain" has been initiated by National Water Mission to nudge states and other stakeholders concerned to keep Rain Water Harvesting Structures ready before the onset of next monsoon season ie June 2020. He informed that the NWM has requested states to set up of district level Rain Centers, as technical guidance centers where anyone can avail information on rain water harvesting techniques and expertise.

Presentation 1: Rainwater Harvesting: Issues, Challenges & Opportunities for Sustainable Development

Shri Deepak Khare, Professor, IIT Roorkee pointed out that same type of rain water harvesting methods and ground water recharge structures cannot be used universally as rainwater infiltration depends upon type of soil, local lithology and type of aquifers available - confined, semi confined and unconfined aquifers. He said water, like religion and ideology, has power to move millions. People move when there is too little water (drought) and there is too much water (flood). He told about actual rain water harvesting methods and their application with appropriate scientific techniques. He recalled that in 2003 roof top rain water harvesting was made mandatory in all urban dwellings and harnessing run-off in catchments by construction of water conservation structures such as gabions, check dams, bhandaras, percolation trenches and sub-surface dykes.

He said, at present, there is a need to manage multiple demands of same quantity of water and prospects for even greater demand in future which will bring more stress in the times to come. The solution lies in the water conservation initiatives which would be taken up by people in India at mass level to conserve rainwater.

Presentation 2: Initiatives of CGWB in Water Conservation

Dr. S. Suresh, Superintending Hydro-geologist, CGWB spoke about past initiatives taken by Central Ground Water Board based on stream orders, local hydro-geological conditions, rainfall pattern and local feasible conditions. They have conduced impact assessment of artificial recharge structures by indirect evidences other than rise in water level. CGWB conducted impact evaluation of sub-surface dykes in Tamil Nadu and Gabion Check Dams at small streams in Kerala. CGWB creates mass awareness on need for water conservation through Information, Communication and Education initiatives. They conducted workshops on community participation on ground water management and also derived water conservation programs in schools.

Presentation 3: Catch the Rain: Rainwater Harvesting for Water Conservation

Dr. Girija K. Bharat, Director, Mu Gamma Consultants Pvt Ltd, Gurgaon explained about the framework which would be used for water conservation. She explained about W's (What, Why, When, Where, Who) of rain water harvesting concept. She also highlighted about existing traditional structures of India such as Jhalara, Tankaas and Johads. She discussed about the difference between rain water harvesting and storm water harvesting focusing on challenges and opportunities. She also mentioned about primary, secondary and tertiary treatments of modern storm water harvesting such as sediment ponds, swales, bio-filtration and wetland conservation.

She highlighted the strategies that could be adopted for rain water harvesting and recharging groundwater. She spoke about drivers and deterrents for rain water harvesting. She advocated

that wecan succeed by (i) maximizing drivers and minimizing deterrents; (ii) by adopting outcome based approach rather than output based; (iii) prospective planning (and not retrospective planning) at all levels of governance; (iv) regular monitoring and hand holding and (v) recognizing good practices and disseminating them for replication.

She also spoke about way forward such as capacity building at local level for rain water harvesting methods based on local conditions, regular analysis of rainfall pattern and encourage community based participatory approach for water conservation.

Presentation 4: Impact of Rainwater Harvesting on Sub-Surface Water Speaker

Shri Rakesh Sahni, Chief Engineer (Water Conservation), Delhi Jal Board highlighted about water conservation initiatives taken by Delhi Jal Board such as promoting rain water harvesting by giving financial assistance up to Rs 87 lacs to 176 institutions for rain water harvesting system installation and also provisioned for rebate on water bills. Around 439 rain water harvesting systems have been installed by DJB across Delhi. More are being covered in phased manner depending on feasibilities and are likely to be completed by March,2019. All government departments have to make provisions of RWH in their buildings.RWH cell is created by DJB for providing technical assistance at free of cost.

He mentioned that DJB has entrusted a feasibility study to WAPCOS for planning and implementation of rain water harvesting and artificial ground water recharge in NCT Delhi. He stated that the proposed recharge schemes in NCT Delhi include Check Dams/Nala Bunds in Ridge Areas, Roof Top Rain Water Schemes in Government Buildings, Government Hospitals, Universities, Institutions and Colleges, Shopping Malls, Housing Societies, Individual housings etc., Percolation Ponds (Existing Village Pond), Lake Basins, Aquifer Storage and Recovery (ASR)Wells, Parks and Gardens Recharge Regions, Flyovers and City Roads, Sport Complexes (Play Ground and Golf Ground) and Yamuna Flood Basin Areas.

Presentation 5: RWH Systems in Cities and Towns of India

Shri M. Ramachandran, IAS (Retd.), former Secretary, Ministry of Urban Development, GoI explicated India's urban water scenario and presented key facts elucidating India's performance on water and sanitation related service indicators. He expounded policy issues which are thwarting our collective efforts towards achieving sustainable, equitable and efficient delivery of water and sanitation services. Some of these challenges include: fragmented responsibilities over water management, poor pricing structures and low rate of recovery, and limited reuse of treated wastewater.

He further presented an outline of past and present government programs that aimed at promoting innovations in urban planning, including promotion of the principles of rain water harvesting. In this regard, he alluded tothe essentials of following programs/policies in mainstreaming water conservation in towns and cities across India:

- JNNURM with its emphasis on reforms to overhaul governance arrangements in urban settlements;
- State Level Improvement Plan as part of AMRUT, covering WASH related services, with its special attention to water auditing;
- URDPFI Guidelines with its provisions to mainstream water management and conservation in the city plans; and
- CPHEEO Guideline's differentiated recommendations accounting for place specific variations in development needs and priorities across towns and cities in India.

Presentation 6: Rainwater Harvesting in India: Regulatory Mechanism

Shri R. Srinivas, Senior Town Planner, TCPO, M/o H&UA, GoI captured the evolving trends vis-a-vis water resources, availability, demand, and spatio-temporal distribution, with a view to establish a unanimous sense of urgency amongst the audience regarding conservation of water.Situating the need for harvesting rainwater in times of water stressed conditions, he exclaimed the key benefits ensuing rainwater harvesting (RWH), expounded various elements constituting a RWH system and the mechanisms available with government to incentivize citizens to harvest rainwater. He posited the potential of RWH practice asserting that "rainwater can be harvested up to the extent of 55,000 liters per 100 m^2 per year from rooftop for a place with normal rainfall in India."

He then explained in detail the various regulatory levers which can aid government in mainstreaming RWH in urban areas. These included Urban and Regional Development Plan Formulation and Implementation Guidelines of MoHUA (2014), and Model Building Bye-Laws (2016). He underscored how these guidelines covers the key concerns pertaining to the designing, implementation and monitoring of a RWH system, both at the level of a city and individual premise. Shri Srinivas exclusively enunciated various provisions promoting RWH in different building/land use types and asserted how such differentiated response helps to capture diverging realities across and within a town or a city. He also expounded the ways in which government schemes, such as AMRUT, is prioritizing urban reforms, including promotion of rainwater harvesting. As he explained, 10% of funds under AMRUT are allocated for successful implementation of reforms, and as a result, "all the States/UTs have incorporated the provision of Rainwater Harvesting in their respective Building Bye Laws except Manipur, Mizoram, Sikkim and Lakshadweep".

He concluded his presentation by showing successful cases of RWH across India, including a snapshot of extant RWH-specific initiatives under SMART City Mission and AMRUT.

Presentation 7: Issues of Water Conservation in MGNREGA

By ShriRaghvendraPratap Singh, Director, M/o RD, GoI mentioned the peculiar nature of water resources problems our country is facing, and underscored, for example, how some of the districts like Rajasthan, Karnataka, &Andhra Pradesh are facing both drought and flood related scourges simultaneously. He described the scale of MNREGA in terms of its geographical, technical, administrative and financial coverage and the ensuing benefits for the rural population. He also articulated the key policy principles of MNREGA Scheme, viz. how the scheme is demand driven, aimed at capturing local priorities, engages Gram sabha for planning and prioritization of works, and focused on linking livelihood, infrastructure creation and natural resources management. Articulating a comprehensive outline of the scheme, he concluded this section by expounding the financial gains to rural households from the MNREGA-sponsored schemes.

Shri R.P. Singh presented an overview of works taken up under MNREGA vis-à-vis water harvesting and explained the scientific tenets which informs these measures. Specifically, he enunciated the principles of 'Ridge to Valley Approach' and explained how it solves the interlinked problem of soil health/integrity and water retention/recharge below surface. He also mentioned how MNREGA is mainstreaming usage of geo-spatial tools, and in this regard, has partnered with National Remote Sensing Centre of ISRO. So far, as he exclaimed, 3.96 crore assets have been geo-tagged for monitoring thereof. He continued describing other innovative tools which are integrated into the planning and delivery of MNREGA Scheme.

Shri R.P. Singh expounded key achievements of MNREGA and presented some of the sub-schemes/programs/projects whereby the benefits of MNREGA are delivered/or being planned for delivery to specific blocks with peculiar needs in a more accelerated and targeted manner. These schemes/programs/projects includes 100 Days Programme, Jal Shakti Abhiyan, Cluster Facilitation Program and Water Security and Climate Adaptation in Rural India. He also presented few cases of successful convergences, whereby State Agencies are accelerating delivery of services to targeted rural population through dovetailing multiple extant schemes of Govt. of India with MNREGA. These cases includes: Mission Kakatiya in Karnataka, NeeruChettu in Andhra Pradesh, Bore Well Recharge in Karnataka, UsarMukti in West Bengal, DobhaNirman in Jharkhand, KapilDhara in Madhya Pradesh and MukhyamantriJalSwavalambanAbhiyan in Rajasthan.

Shri R.P. Singh concluded his presentation by expounding the future course of trajectory with respect to delivering the full scope of benefits as outlined in MNREGA, and, moreover, presented few case stories from the field to inspire confidence amongst the audience as to the success of MNREGA in transforming rural lives across India.

Presentation 8: Macro Water Harvesting

By Shri Manu Bhatnagar, Principal Director, INTACHpresented an overview of INTACH's works across geographies of ecological destructions in India. As construed from his presentation, INTACH's initiatives regarding water conservation are based on following premise:

- Integrating water management in the planning process.
- Incorporating the needs of wildlife and promote principles of sustainable co-existence.
- Promoting importance of local geographical features, such as hills around NCR region/North Rajasthan and topographical peculiarities, to capture diversities across regions and build conservation measures around these understandings.
- Exploring recycling of wastewater as an alternative source for rejuvenating urban water bodies, as seen in HauzKhas Lake, Delhi.
- Undertaking watershed level analysis and restoring tributaries/rivulets for enhancing overall basin health and that of the river.

The workshop ended with Shri J.P. Singh, Deputy Secretary, National Water Mission thanking all the speakers with a token of appreciation. Hearty appreciation was also extended to the participants for enriching the overall quality of discussion.

*****