

**TRAINERS' TRAINING PROGRAMME ON
SUSTAINABLE RAINWATER HARVESTING AND GROUND WATER RECHARGE
IN DEVELOPING COUNTRIES - HRD AND TECHNOLOGY TRANSFER**

**BENGALURU, INDIA
22 – 27 FEBRUARY 2010**

PARTICIPATING COUNTRIES: 16 Developing Countries (Including 14 Member Countries and 1 S&T-Industry Network Members of the NAM S&T Centre)

NUMBER OF PARTICIPANTS: The Programme was attended by 26 trainee participants, including 15 foreign delegates and 11 Indian professionals, and 20 resource persons/ trainers from India and Sri Lanka.

BRIEF REPORT

Rainwater Harvesting (RWH) entails the collection of rain in a scientific and controlled manner for future use and comprises harvesting of water from the roof tops and open areas such as paved ways, parks, roads and fields and collecting the same in lakes, ponds, wells and storage tanks. Water is an essential daily need across the cross-section of the society. With the ever-increasing population, migration of vast multitudes of rural population to metros and urban areas and development of industrial towns, the existing infrastructure in the developing countries are facing great pressure on conventional water supply systems and severe constraints on financial and material resources. Moreover the municipal water supply in most cities is unreliable and potable water supply does not exist in many villages. The developing countries often neglect the most proven and sustainable methods of decentralized water collection and usage systems. In this regard, to provide sustainability the traditional methods of water harvesting and usage methods need to be revived and if required, modified to suit the present day requirement.

To address the above issues, the Centre for Science and Technology of the Non-aligned and Other Developing Countries (NAM S&T Centre) is executing a collaborative project entitled 'Sustainable Rainwater Harvesting and Ground Water Recharge in Developing Countries - HRD and Technology Transfer' with partial financial support by the Group of 77 Countries (G-77) under its Perez-Guerrero Trust Fund for Economic and

Technical Cooperation among Developing Countries (PGTF). The project is an integrated effort on rainwater harvesting and ground water recharge to provide a model solution for the water shortage problem in conventional water supply systems.

As a part of the above G-77/PGTF Project, the Centre for Science and Technology of the Non-aligned and Other Developing Countries (NAM S&T Centre) and the Karnataka State Council for Science & Technology (KSCST) with partial financial support of the Department of Science and Technology (DST), Ministry of Science and Technology, Government of India organised a 6 days Trainers' Training Programme on 'Sustainable Rainwater Harvesting and Ground Water Recharge in Developing Countries - HRD and Technology Transfer' during 22-27 February 2010 in Bengaluru, India.

During the Inaugural Session after singing of the Karnataka State anthem a symbolic opening of the training course was made by a practical demonstration of a rooftop water harvesting model. Mr. A. R. Shivakumar, Executive Secretary of KSCST welcomed the delegates followed by a presentation of the genesis of the training programme by Prof. Arun P. Kulshreshtha, Director, NAM S&T Centre; Inaugural Address by Dr. Laxman Prasad, Advisor & Head, DST, Government of India; and Presidential Address by Prof. B. N. Raghunandan, Divisional Chairman (Science & Technology) of the Indian Institute of Science, Bangalore. Mr. H. Hemanth Kumar, Fellow & Principal Investigator, NRDMS, KSCST presented the Vote of Thanks.

The training course was attended by 26 trainee participants, including 15 foreign delegates - one each from Botswana, Cambodia, Egypt, Indonesia, Iran, Kenya, Malawi, Mauritius, Myanmar, Nepal, Pakistan, Sri Lanka, Sudan, Uganda and Zambia; and 11 from the host country India, representing the Karnataka, Maharashtra, Punjab and Tamilnadu States of India. In addition, there were 19 resource persons / trainers from India and one resource person from Sri Lanka. All the participants were active professionals in the fields related to water management, water technology, rainwater harvesting, groundwater recharge and related areas.

The overseas trainee participants were from Botswana [Mr. Jackson Ndiwa Aliwa, Acting Director, Technology Development Department, Botswana Technology Centre (BOTEC), Gaborone]; Cambodia [Mr. Kimhean Chansopheaktra, Deputy Chief of Forestry,

Ministry of Agriculture Forestry and Fishery]; Egypt [Prof. Badr Mohamed Ahmed Mabrouk, Professor in Hydrology and Water Management, Zagazig University, Cairo]; Indonesia [Dr. Rachmat Fajar Lubis, Researcher, Research Center For Geotechnology, Indonesian Institute of Sciences (LIPI), Bandung]; Iran [Dr. M. Molanejad, Director of International Cooperation, Iranian Research Organization for Science and Technology (IROST), Tehran]; Kenya [Mr. Wandera Simon Mondono, Lecturer, Kenya Water Institute, Nairobi]; Malawi [Mr. Toney Hamilton Nyasulu, Hydrogeological Research Officer, Ministry of Irrigation and Water Development, Lilongwe]; Mauritius [Mr. Mahendra Kumar Bissessur, Engineer (Planning & Maintenance), Water Resources Unit, Ministry of Renewable Energy and Public Utilities, Rose Hill]; Myanmar [Prof. (Ms.) Theint, Professor, Department of Technical and Vocational Education, Ministry of Science and Technology, Nay Pyi Taw]; Nepal [Mr. Arun Kumar Simkhada, Senior Divisional Engineer, Water Supply and Sanitation Division Office, Narayani Zone]; Pakistan [Mr. Muhammad Suleman Saeed, Coordinator, Integrated Water Resource Management (IWRM), International Union for Conservation of Nature (IUCN), Quetta]; Sri Lanka [Mr. Mawanane Hewa Janaka Prasad Gunarathna, Lecturer, Department of Soil & Water Resources Management, Faculty of Agriculture, Rajarata University, Anuradhapura]; Sudan [Dr. Lubna M. Musa, Soil and Water Scientist, Department of Soil and Water Science, Faculty of Agricultural Sciences, University of Gezira, Wadmedan]; Uganda [Ms. Mary Kibahigire, Social & Community Development Officer, Water Governance Institute (WGI), Kampala]; and Zambia [Mr. Albert Chomba, Acting Principal Water Engineer, Department of Water Affairs, Lusaka].

The Indian trainee participants were Dr. H. Lakshmikantha, Environment Officer, Karnataka State Pollution Control Board, Bangalore; Mr. Harprit Singh Virk, Environment Consultant, Community Welfare Society, Bathinda, Punjab; Mr. A. Natarajan, Chief Engineer & Director, Public Works Department, Institute for Water Studies, Tharamani, Chennai; Mr. Keshar Singh, Himalayan Gram Vikas Samiti (H.G.V.S.), HGVS Gangolihat, Uttarakhand; Mr. Sachin Tiwale and Mr. Priyadarshan Sahasrabuddhe, Fellows, Maharashtra Knowledge Corporation Ltd. (MKCL), Pune; Er. M. N. Thippeswamy, Consultant / Chief Engineer (Retd.), Mr. Goutham Kumar, Executive Engineer, Mr. Chandrashekar, Assistant Executive Engineer and Mr. Manjunath, Assistant Engineer from Bangalore Water Supply &

Sewerage Board (BWSSB); and Mr. Gaurav Gaur, Research Assistant from the NAM S&T Centre, New Delhi.

During the Training programme, lectures were delivered by Mr. S. Vishwanath, Secretary, International Rainwater Catchment System Association [on 'A Quick Global Scan of Rainwater Harvesting']; Mr. A. R. Shivakumar from KSCST [on 'Need for Rainwater Harvesting', 'RWH – Roof Top & Open Space Methods' and 'RWH Design, Plan, Material and Cost Estimation']; Prof. M. Sekhar, Dept. of Civil Engg., Indian Institute of Science (IISc), Bengaluru [on 'Sustainable Groundwater Management under the IUWM: Recharge & Assessment']; Mr. C.S. Ramashesha, Member (Rtd.), Central Ground Water Board (CGWB), Government of India [on 'Ground Water Resources Estimation Methodology – 1997' and 'Concept of Artificial Recharge to Ground Water']; Mr. A. Ravindra, Adviser to Chief Minister (Rtd.), Centre for Sustainable Development (CSD) [on 'Policy on Urban Water Supply - Guidelines and Strategies']; Mr. Kemparamaiah, Chief Engineer, Bangalore Water Supply & Sewerage Board (BWSSB) [on 'Water Supply and Demand - Source and Strategy']; Mr. N. J. Devaraja Reddy, CEO, Hydro Geologist & Rain Water Advisor, Geo Water Board, Chitradurga [on 'Dynamics of Tubewell - Recharge and Revival - Field Experience']; Mr. Y. A. Takur, Additional Programme Director, BAIF Institute for Rural Development, Tiptur, Karnataka [on 'Networking of Farm Ponds - A Novel Method for Rainwater Harvesting and Management in Dryland Farming']; Mr. Vasant Takalkar, RWH Field Expert, Maharashtra Knowledge Corporation Ltd. (MKCL), Pune [on 'Continuous Contour Trenching: A Solution for Watershed Development']; Mr. P. B. Ramamurthy, Chairman, BWSSB [on 'Water Audit - Supply Demand and Conservation Strategies']; Dr. (Mrs.) M.V. Shashirekha, Chief Chemist, Department of Mines & Geology, Government of Karnataka [on 'Groundwater Pollution due to Industrial Effluent']; Prof. (Dr.) M. Sudhakar Rao, Professor, Department of Civil Engineering, and Chairman, Center for Sustainable Technologies, IISc – Bangalore [on 'Groundwater Quality Issues in India']; Ms. Tanuja Ariyananda, Director, Lanka Rain Water Harvesting Forum, Nugegoda, Sri Lanka [on 'Promoting Domestic Rain Water Harvesting in Sri Lanka']; Mr. Sadashivaiah, Chairman, Karnataka State Pollution Control Board, Bengaluru [on 'Water Environment and Industry – Linkages']; Prof. M. S. Mohan Kumar, Secretary, KSCST and Professor, Department of Civil Engineering, IISc – Bengaluru [on 'Watershed - Planning, Management and

Catchments Area Treatment’]; Prof. Ram Takwale, President, Indian Consortium for Educational Transformation (I- CONSENT), Pune, Maharashtra [on ‘Rainwater Harvesting and Sustainable Social Development’]; and Mr. K. Amaranarayana, Deputy Commissioner & District Magistrate, Devangere District, Karnataka [on ‘Ancient Water System and Its Relevance Today in Recharging Ground Water – A Case Study of Chitradurga City’]. Case Studies were presented by Mr. A. R. Shivakumar from KSCST on residential sector and Mr. John Daniel from Great Bear Promotions on commercial sector, which was followed by an interactive lecture by Mr. Cecil K. Dewars, Senior Vice President – HR, TVS Motors. Mr. Anil Durge, Manager Marketing, Raj Irritech Pvt. Ltd. shared his experiences on corporate sector.

The training programme was conducted in five technical sessions and 1½-day field visits to several places for demonstration of various RWH schemes. The technical sessions broadly addressed the principles of Rainwater Harvesting (RWH), various methods in practice for rooftop and open spaces RWH with design, plan, cost estimation etc.; RWH in small farms and agricultural fields; Resource Estimation; Resource - Water Quality and Effects (health, land, water source etc.); Conservation and artificial recharge, design, plan, cost estimation etc.; Ground water recharge - open space, dug wells, tube wells, trenches, farm ponds etc.

The field visits in Bengaluru city included the offices (KSCST office), residential buildings (IISc staff quarters), apartments (Chief Minister’s residence-cum-office), a residential layout with 300 houses at Koramangala, and parks and open spaces. The outstation field visit organised to the rural sites located ~ 280 km from Bengaluru city included Nirmithi Kendra at Hirehalli, Tumkur district with demonstration of RWH training facilities and RWH techniques for use in rural houses, huts, schools and navagramas (low cost village houses) and Mailanahalli (Arisikere taluk, Hassan District) and Lakkihalli (Tiptur Taluk, Tumkur district) villages supported by BAIF, Tiptur for showing watershed management programme. RWH in these villages is being practised for self-sustained potable water for drinking and farming under the supervision of BAIF Institute for Rural Development. Two famous heritage sites, namely, Halebidu, and Chennakeshava Temple at Belur were also visited.

The outcome of the technical sessions and lessons learned from the field visits were discussed in a panel discussion with the panelists being Prof. MS Mohan Kumar, Mr. Shivakumar, Mr. Ramashesha, Mr. John Daniel, Mr. Vishwanath and Mr. Kemparamaiah. The trainees felt a strong need of setting up (i) a working group to discuss the status and chalking out future strategies of action on rainwater harvesting and groundwater recharge and (ii) an e-platform for interaction to resolve individual queries through Internet. It was also decided that a hand book on RWH would be created with the help of KSCST and MKCL, and NAM S&T Centre would circulate the same to all concerned and also incorporate it in the report that would be prepared for the G-77 project.

A session on 'Experience Sharing' was chaired by Prof Arun P Kulshreshtha, Director, NAM S&T Centre in which the individual foreign participants elaborated upon their requirements and future activities to be undertaken by them in their respective countries based on the knowledge gathered during the training course. The experiences of the participants were also gathered in the form of feedback forms filled-up by them, which were discussed by a panel moderated by Mr. M. Bandyopadhyay of the NAM S&T Centre.

In the Valedictory Function Mr. M.S. Thippeswami (BWSSB), Mr. Sanjay Bajpai (Director, Mission on WAR for Water in the Department of Science & Technology, Government of India), Prof. M. S. Mohan Kumar, Prof. Arun P Kulshreshtha, and Mr. M. Bandyopadhyay presented their views on various aspects of the training programme. The Function concluded with the distribution of participation certificates to the participants and warm words of appreciation for the organisers of the course.

The proceedings of the training programme were extensively covered by the leading national and international news agencies.

#####