



**Centre for Science and Technology of the Non-Aligned and Other  
Developing Countries (NAM S&T Centre)**

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**PROJECT COMPLETION REPORT**  
**on G-77/PGTF Project on “Sustainable Rainwater Harvesting and Ground  
Water Recharge in Developing Countries - HRD and Technology Transfer”**  
**(Project No. 61967 (UNDP Ref. No. INT/08/K02))**

**1. THE PROJECT**

In order to deliberate on the importance of Rainwater Harvesting (RWH) and Ground Water Recharge (GWR) and the mechanisms for capacity building and transfer of technology in RWH and GWR practices to ensure potable water supply and improve groundwater level in the developing countries, the Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) has executed a multilateral collaborative project entitled 'Sustainable Rainwater Harvesting and Ground Water Recharge in Developing Countries - HRD and Technology Transfer' with partial financial support under Perez-Guerrero Trust Fund (PGTF) for Economic and Technical Cooperation among Developing Countries (ECDC/TCDC) of the Group of 77 (G-77).

The project was aimed at capacity building through HRD and technology transfer by preparing a state-of-the-art report and carrying out a centralized training programme for professionals engaged in implementing relevant schemes that would empower the participants to train local technicians, which has been successfully achieved within its approved duration of 3 years.

Total estimated budget of the project was US\$88,609 out of which NAM S&T Centre being an implementation agency, was expected to contribute minimum half of the estimated expenditure.

**2. GENESIS OF THE PROJECT**

The NAM S&T Centre had in the past successfully implemented two projects on (a) low cost housing technology and (b) biological control of pests and weeds, with partial financial support of the Perez-Guerrero Trust Fund (PGTF) for Economic and Technical Cooperation among Developing Countries (ECDC/TCDC) of the Group of 77 (G-77).

In response to a communication received from the Office of the Chairman of the Group of 77 in New York, the Centre had submitted a new project proposal in March 2006 entitled 'Sustainable Rainwater Harvesting and Ground Water Recharge in Developing Countries - HRD and Technology Transfer' for financial support under PGTF for year 2006 project cycle. In subsequent evaluation by the Committee of Experts of PGTF, the proposal was found suitable from technical angle, but H.E. Ambassador Dumisani S. Kumalo, the then Chairman of G-77 had informed the Centre that the project could not be recommended for financial grant without the written concurrence from the concerned participating countries, which is one of the eligibility criteria for PGTF projects.

The Office of the Chairman of the G-77 had then informed the NAM S&T Centre that their 2007 project cycle was open and advised that the Centre may resubmit the above proposal (along with concurrence from the participating countries) to them by 30<sup>th</sup> April 2007 for its re-consideration.

Accordingly, the NAM S&T Centre had sought the interest of its member countries to participate in this project. Initially, 10 countries namely, Egypt, Indonesia, Iran, Kenya, Malawi, Myanmar, South Africa, Sri Lanka, Tanzania and Zambia had confirmed their participation in the project, which also identified their Country Coordinators to assist the Centre in the implementation of the project. Later, Botswana, Cambodia, India, Mauritius, Nepal, Pakistan, Sudan and Uganda joined the activities under the project by nominating their experts to participate in the workshop and the training programme organised by the NAM S&T Centre as part of the project implementation.

The project was found suitable from technical angle and G-77 Ministers for Foreign Affairs approved the project in their 31<sup>st</sup> Annual Meeting in New York on 27<sup>th</sup> September 2007, and the agreed Project Document was signed by UNDP on 5<sup>th</sup> June 2008. Out of a total project cost of US\$88,609, G-77 approved an amount of US\$42,309 as partial financial support for the project, while the remaining US\$46,300 would have to be arranged by the NAM S&T Centre. The G-77 support was released to the NAM S&T Centre through UNDP-India in July 2008.

### **3. AIMS AND OBJECTIVES**

The Project was an integrated effort on Rain Water Harvesting (RWH) and Ground Water Recharge (GWR) as a model solution to solve the water shortage problem in conventional water supply systems in the developing countries.

Prime objective of the Project was capacity building through HRD and technology transfer by executing two major components:

- A. Preparing a State-of-the-Art Report to help professionals in planning and modifying water conservation and supply schemes, and
- B. Holding a centralized Training Programme for ~20 professionals engaged in implementing relevant schemes to empower them to organize national level training courses for water technicians

However, for successful implementation of the above two components and strengthening the outcomes of the project, the Project Apex Committee decided to include some peripheral activities focused to generate sufficient information, material and feedback for the two major components and ensure their long term effect. These additional activities were helpful in making the events and their outcomes more specific to the problems of the developing countries.

### **4. APEX COMMITTEE**

An Apex Committee was constituted which was the centralized body for devising strategies, engineering schemes and implementation policies for the rainwater harvesting and groundwater recharge as mentioned in the final project document submitted to UNDP – India.

The Apex Committee in this project comprised:

- i. **Chairman** - Prof. Arun P. Kulshreshtha, Director, NAM S&T Centre, New Delhi, India

- ii. **Member Secretary** - Mr. M. Bandyopadhyay, Senior Expert and Administrative Officer, NAM S&T Centre, New Delhi, India

**Members –**

- iii. Ms. Tanuja N. Ariyananda, Director, Lanka Rainwater Harvesting Forum (LRHF), Nugegoda, Sri Lanka
- iv. Mr. A. R. Shivakumar, Principal Investigator – RWH/ Prof. M. S. Mohan Kumar, Secretary, Karnataka State Council for Science and Technology (KSCST), Indian Institute of Science, Bangalore, India
- v. Prof. Ram Takwale, President, Indian Consortium for Educational Transformation (I-CONSENT), Pune, India
- vi. Mr. Vasant Takalkar, Consultant, Maharashtra Knowledge Corporation Ltd. (MKCL), Pune, India

It may be noted that:

- UNDP–India did not nominate any representative as the member of the Apex Committee despite requests from the NAM S&T Centre.
- Initially, Dr. Gita Kavarana from the Centre for Science and Environment (CSE), New Delhi, India was also among the members of the Apex Committee. But subsequently CSE withdrew from the project due to various administrative and financial problems at their end, and thereafter KSCST, I-CONSENT and MKCL came forward to help the Centre in the implementation of this project and were added to the Apex Committee.

In order to achieve the agreed objectives, the Apex Committee in the project upgraded the earlier version of the implementation strategy and work-plan by extending the implementation strategy for its execution through the following five components:

- i. Organisation of an international workshop with participation of water technology professionals from various countries and also some experts as resource persons;
- ii. Preparation of model schemes on RWH for developing countries;
- iii. Preparation of a State-of-the-Art (SOTA) Report based on the information collected from the participating countries and the papers presented by the participants in the workshop;
- iv. Preparation of handbook and course material for organising a trainers' training programme; and
- v. Organisation of a 6-day Trainers' Training Programme including field visits, in which professionals/trainers from developing countries were would be trained who in turn would be able to train water technicians in their own countries.

In these components, those at number (i) and (ii) were aimed at knowing the current status and related policies of the participating countries on RWH & GWR practices and devising a model scheme for these countries, which together would be helpful in preparing the major part of the State-of-the-Art Report i.e. component number (iii). The feedback received from the participating countries on various water related issues assisted the experts in preparing the training module for the Trainers' Training Programme and handbook on RWH & GWR, i.e. component number (iv). The Trainers' Training programme at component number (v) provided meaningful data on practical

aspects of the subject which along with the handbook and training manual provided shape to the next part of the SOTA Report other than country reports.

To analyse the direction and progress of the project, and to discuss and monitor the future course of action on the project, the Apex Committee met four times during the 3 years' duration of the project as below:

- In New Delhi, India on 15<sup>th</sup> October 2008;
- In Pune, Maharashtra, India on 20<sup>th</sup> August 2009;
- In Bengaluru, India on 26<sup>th</sup> February 2010; and
- In Colombo, Sri Lanka on 10<sup>th</sup> November 2010.

## **5. IMPLEMENTATION OF THE PROJECT**

The major events during the course of the project are mentioned below in the chronological order of their commencement.

### **A. PROJECT INITIATION:**

Project activities were started with effect from July 2008 after the G-77 financial support was received by the NAM S&T Centre through UNDP-India as stated earlier (refer Section-2, 'Genesis of the Project').

### **B. PARTICIPATION BY DEVELOPING COUNTRIES:**

As indicated in Section-2, 'Genesis of the Project', a total of 18 developing countries have participated in the Project.

### **C. 1<sup>ST</sup> MEETING OF THE APEX COMMITTEE:**

The first meeting of the Apex Committee was organized on 15<sup>th</sup> October 2008 at the Secretariat of the NAM S&T Centre in New Delhi, India, and concluded with the inclusion of two additional activities and a detailed work plan on executing all the activities along with allocation of responsibilities. Execution of the project was decided to be carried-out through the following components:

- i. Organisation of an international workshop in August 2009 at Pune, India with participation of water technology professionals from various countries and also some experts as resource persons. Presentation of Country Status Reports and papers by the resource persons during the workshop.
- ii. Preparation of model schemes on RWH for developing countries.
- iii. Preparation of a framework for the State-of-the-Art (SOTA) Report.
- iv. Preparation of the State-of-the-Art (SOTA) Report based on the information collected from the participating countries and the papers presented by the participants in the international workshop.
- v. Preparation of a handbook and course material for the trainers' training programme.
- vi. Preparation of a model questionnaire for eliciting information from the participating countries for designing the trainers' training programme.
- vii. Organisation of a trainers' training programme including field visits in which the professionals and trainers from developing countries would be trained who in turn would be able to train water technicians in their own countries.

In this connection the following may please be noted:

- The additional activity 'Preparation of a Framework for SOTA Report' was devised to maintain uniformity in the status reports to be received from country representatives, while 'Preparation of a Model Questionnaire' was introduced to make the training programme more focused to the problems of participating countries.
- Allocation of Responsibilities among Partner Agencies: The Committee decided with the concurrence of its members that the technical assistance and local facilitation for the Pune workshop will be provided by MKCL and I-CONSENT and for the Trainers' Training programme by CSE [which was subsequently transferred to Karnataka State Council for Science & Technology (KSCST), Begaluru, India]; and Ms. Tanuja Ariyananda of Lanka Rainwater Harvesting Forum will be editing the major part of the SOTA report i.e. country status reports received from the country representatives.

#### **D. FRAMEWORK OF COUNTRY STATUS REPORT**

A framework for preparing the country status reports was prepared by Ms. Tanuja Ariyananda of Lanka Rainwater Harvesting Forum, and circulated to the country coordinators so that they or their representatives who were going to participate in the proposed workshop at Pune may start collecting information on RWH & GWR practises in their respective countries and compile their country status reports accordingly for its presentation during the Pune Workshop.

#### **E. MODEL QUESTIONNAIRE**

A model questionnaire to elicit detailed information from the participating countries on the rainfall pattern, rainwater quality, existing RWH projects and other relevant data required was prepared by the representative from CSE, New Delhi, India, which was circulated to the country coordinators so that the training module and course material for proposed Trainers' Training Programme can be accordingly designed.

#### **F. INTERNATIONAL WORKSHOP (AT PUNE, INDIA):**

A 4 days International Workshop on 'Rainwater Harvesting and Ground Water Recharge in Developing Countries - HRD and Technology Transfer' was organised by the NAM S&T Centre at Pune, India during 17-20 August 2009 in association with the partner agencies, Maharashtra Knowledge Corporation Ltd. (MKCL) and the Indian Consortium for Educational Transformation (I-CONSENT) of Pune, India.

The workshop was attended by 29 senior experts and professionals from 15 developing countries and 14 Indian participants, and concluded with the adoption of 'Pune Recommendations'. Overseas participation was from Botswana, Cambodia, Egypt, Indonesia, Iran, Kenya, Malawi, Myanmar, Nepal, Sri Lanka, Tanzania, Uganda, Vietnam and Zambia. The overall programme of the workshop was organized in seven Technical Sessions held on 17<sup>th</sup> and 18<sup>th</sup> August 2009, a field visit on the 19<sup>th</sup> instant, and a Concluding Session on the 20<sup>th</sup> instant. All the 15 foreign participants presented their country status reports on RWH/GWR while case studies were presented by 6 Indian participants.

#### **G. 2<sup>ND</sup> MEETING OF THE APEX COMMITTEE:**

The Second Meeting of the Apex Committee of the project was organised on 20<sup>th</sup> August 2009 at Pune, India followed by the concluding session of the above workshop, in which the matters regarding compilation and editing the country papers for the proposed State-of-the-Art Report were discussed besides other significant issues relevant to the organisation of the Trainers' Training Programme.

#### **H. TRAINERS' TRAINING PROGRAMME (AT BENGALURU, INDIA):**

While most of the participants of the Pune Workshop were the senior officials in the relevant departments or ministries, scientists and people to primarily discuss the policy issues on the Rainwater Harvesting and Ground Water Recharge, for the Trainers' Training Programme a condition was set that only the real working people or technical persons or water technicians should undertake the training to discuss the ground level issues on RWH/GWR.

Keeping the above in view, the Centre organized a 6 days Trainers' Training Programme on 'Sustainable Rainwater Harvesting and Ground Water Recharge in Developing Countries - HRD and Technology Transfer' in Bengaluru, India during 22-27 February 2010 jointly with the Karnataka State Council for Science & Technology (KSCST). It 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. 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.

#### **I. 3<sup>RD</sup> MEETING OF THE APEX COMMITTEE:**

The Third Meeting of the Apex Committee of the project was organised on 26<sup>th</sup> February 2010 at Bengaluru, India to discuss the progress of the State-of-the-Art (SOTA) Report and various other issues.

#### **J. 4<sup>TH</sup> MEETING OF THE APEX COMMITTEE:**

The Fourth Meeting of the Apex Committee was organised on 10<sup>th</sup> November 2010 at Colombo, Sri Lanka under the hospitality of the National Science and Technology Commission (NASTEC) of Sri Lanka to discuss and finalise the contents and shape of the SOTA Report. In this meeting Prof. Badr M. A. Mabrouk from Zagazig University of Egypt and two senior officials from the Ministry of Research and Technology of Indonesia were special invitees.

#### **K. PREPARATION OF THE STATE-OF-THE-ART REPORT**

Inputs were received from the members of the Apex Committee on their respective assignments. Thus, for example, Mr. Shivakumar gathered relevant information from the papers presented during Bengaluru Training Programme, compiled them and sent to Ms. Ariyananda for inclusion in the Indian profile of the main SOTA report. Ms. Ariyananda revised the available material with the information received from Mr. Shivakumar and the edited compilation of the country status papers was received by the NAM S&T Centre along with an 'Executive Summary' on the main SOTA Report. The Centre also received the 'RWH & GWR Manual for Rural Areas' from Mr. Takalkar and 'Trainers' Manual and RWH Guide' from Mr. Shivakumar that formed the latter part of the SOTA Report as recommended by the Apex Committee in its third meeting.

The State of the Art (SOTA) Report has now been prepared and printed which would be circulated to the participating countries for necessary action and further follow-up in the respective countries.

#### **L. COMPLETION OF THE PROJECT**

After all the components of the project were implemented and the objectives of the same were fulfilled, the Project was completed on 30<sup>th</sup> August 2011.

#### **6. FOLLOW-UP AND FUTURE ACTIVITIES**

**Completed:**

**(I) TRAINING PROGRAMME IN SRI LANKA**

Lanka Rainwater Harvesting (LRWH) Forum of Sri Lanka organised a Training Programme on RWH/GWR for the community workers in Anuradhapura District of Sri Lanka during 9<sup>th</sup> -12<sup>th</sup> June 2010.

**(II) SEMINAR IN SRI LANKA**

Lanka Rainwater Harvesting (LRWH) Forum also organized in association with the National Science and Technology Commission (NASTEC) of Sri Lanka and the NAM S&T Centre a Seminar on Rainwater Harvesting & Groundwater Recharging on 10<sup>th</sup> November 2010 at the premises of the National Science Foundation (NSF), Colombo, Sri Lanka with participation of 65 persons representing various government and non-government organisations, international agencies and media representatives.

**Pending:**

(i) The NAM S&T Centre was planning to organise a 5-days African Regional Training Workshop on 'Rainwater Harvesting' at Marsa Matrouh in Egypt during 22-26 March 2011 jointly with the Academy of Scientific Research and Technology (ASRT), Zagazig University (ZU) and Matrouh Governorate (MG) of Egypt. However, the unforeseen developments in Egypt forced the Egyptian co-organisers to postpone the workshop till some time later.

**On-going:**

The E-learning Programme on RWH is under preparation by MKCL and will soon be launched.

**Future Activities:**

(I) As decided by the Apex Committee, the representatives of the participating countries in the project will be requested to submit a report to the NAM S&T Centre on how they used the information or training received in the workshop and the training course organized under the project, and the follow up actions taken by them for capacity building in RWH & GWR practices in their own countries.

(II) An international event on water related theme is planned for its joint organisation by the NAM S&T Centre and the Indian Institute of Science (IISc) / KSCST, Bangalore, India in coming 2-3 years depending on the available of a suitable slot and finances.

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