

Enhancement of natural water systems and treatment methods for safe and sustainable water supply in India

Biannual Newsletter 3
13th of June 2013

Saph Pani

Saph Pani is an EU funded collaborative research project which started in October 2011 with duration of three years involving a consortium of 20 partners from India, European Union, Switzerland, Sri Lanka and Australia. Its full name is "Enhancement of natural water systems and treatment methods for safe and sustainable water

supply in India" and it addresses the water challenges of the 21th century. Saph Pani builds on already existing Indian projects for natural treatment and storage of water identifying potential for their improvement by applying hi-tech measurement equipment and conducting field trials. For more information, visit: www.saphpani.eu

Special Feature

The Work Package 2 of the Saph Pani project is called "Managed aquifer recharge and soil aquifer treatment". Managed aquifer recharge (MAR) is an intentional storage and treatment on water aquifers and can serve as an effective option to meet the growing groundwater demands. MAR can also help to prevent seawater intrusion into the aquifers, which is a major problem for many coastal cities.

Interview with Prof Elango Lakshmanan

Professor Elango Lakshmanan is working at the Department of Geology at the renowned Anna University, Chennai, Tamil Nadu, India. He has over 25 years of experience in the hydrogeology sector and 64 publications as well as several book contributions. He is deputy leader of WP 2, and responsible for the activities at the field sites in Chennai. Recently Professor Elango received the Tamil Nadu Scientist Award for the year 2011 in Environmental Science. The research work carried out for Saph Pani played a significant role for his achievement.



seawater intrusion by increasing the recharge and diluting the ionic concentration of the contaminated groundwater. Even though the efficacy of MAR methods varies considerably, depending on the aquifer properties, availability of water for recharge, quality of recharging water, clogging ,etc., this method can be employed successfully if detailed prior investigations and proper maintenance are carried out.

How is your experience with Saph Pani so far?

Being a collaborative multi-disciplinary and multi institutional research project, Saph Pani provided opportunities for me to interact and discuss the research problems and solutions with various partners. I gained great experience in also looking into the problems faced and the solutions arrived by other partners working in research areas in which I am a novice. It gives me a sense of happiness as there are several experts in the Saph Pani project family to help me in arriving at meaningful solutions to the scientific problems we have. Saph pani is giving a platform to investigate in detail the

How do you think can MAR help to stop salt water intrusion?

MAR is an effective and innovative method to reduce

effect of pilot percolation ponds in enhancing the aquifer recharge and in managing seawater intrusion in North of Chennai. As this method adopted in Chennai is cost effective and is economically feasible for even poor farmers, we, being a part of Saph Pani, are trying to promulgate the need and feasibility of recharge structures such as percolation ponds, to the public.

What do you hope to achieve with Saph Pani?

About 18 % of the world's population is in India, but it only has approximately 4 % of the world's freshwater resources. With increasing population in India, the per capita availability of water decrease year after year. In case of Chennai, the fourth largest city in India, seawater intrusion in coastal aquifers that supply to part of the city's drinking waters is a major problem. Through the Saph Pani project we aim to address the problem of seawater intrusion and depletion of groundwater resources by MAR utilising the excess monsoon water. This work is being carried out through pilot studies, which will assist in preventing seawater intrusion. The water recharged through MAR during monsoon season will be available to meet the demand in dry seasons. In this context, Saph Pani will show the way in enhancing the aquifer potential and conserving water resources. This project, Saph Pani is showcasing the role of interactive research in sustainably developing the natural resources like groundwater.

MAR training course at Anna University, Chennai

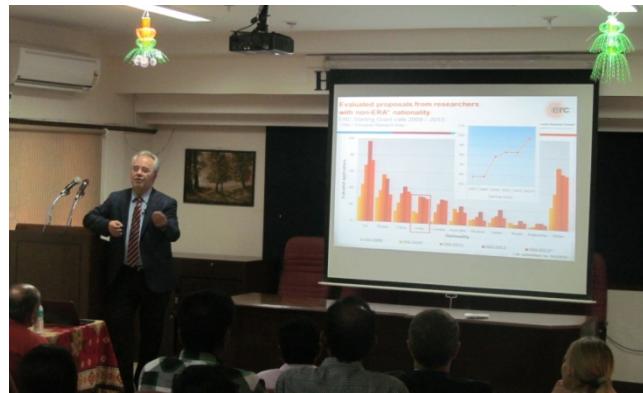
A two day certification International Training Program on "Managed Aquifer Recharge: Methods, Hydrogeological Requirement, Post and Pre-treatment System" was organised by Anna University, Chennai in association with National Institute of Hydrology, Roorkee on 11th and 12th December 2012, as an activity of Saph Pani. About 40 scientists and research scholars from different organizations from India and abroad have benefited by attending this course.



Participants of the two day training course

European Research Council on a visit to Anna University, Chennai

A delegation of European Research Council comprising of the Secretary General, Prof. Donald Dingwell visited Anna University, Chennai on 8th March 2013, to raise awareness on ERC funding agencies and the possible research collaborations. Welcome address about the campaign was given by Dr. Philippe de Taxis du Poët, Science Counsellor of ERC and an inspirational speech on the new opportunities and directions in the field of research was delivered by ERC grant holder Dr. Ramesh Pillai. Saph Pani was pointed out as an example for a successful EU-India research collaboration.



Prof. Donald Dingwell, ERC secretary general delivering a speech on the EU fundings and research possibilities

Educational video of Chennai case study shot

The research activities of Saph Pani was filmed at the Chennai study sites by an official producer of EU on 13th January 2013 for the film on EU India relations. Dr. Elango Lakshmanan was interviewed on the possibilities and potential applications of MAR in improving the groundwater sustainability in Chennai aquifer.

Field sampling and sample preparation in Chennai

During April 3rd to April 18th Liang Yu and Julia Prock from FHNW conducted a series of sample collection and sample preparation campaign at the check dam site with Parimala Renganayaki from Anna University. The samples were processed at the laboratory of the geology department of Anna University. Chlorinated Pesticides are one of the target compounds that are investigated. Solid Phase Extraction (SPE) was conducted in order to extract these compounds. The dried cartridges are brought to Switzerland for further

analysis. Organic, inorganic and biology parameters have been measured as well. The target of this sampling campaign is to provide water quality information in order to select a proper post treatment option for the region. Such sampling will be conducted in the future once in two months during this project by Anna University.



Liang Yu, Parimala Renganayaki and Julia Prock

Progress of establishing Research Station named “Water Prospect” and “Water Blessing” on IITB Campus

The construction of pilot scale sewage treatment plants (Research Stations) based on constructed wetlands (CWs) are in progress at IIT Bombay campus. The treated effluent generated from various modules of CWs be subjected to the membrane processing units in the laboratory set-up and investigation of possibilities of combining CWs with advanced tertiary treatment unit will be undertaken - which is the main focus in the present research of IITB.

A large enough plot situated at the sewage sump of IITB community has been allotted for establishing one of the Research Stations. The allotted location for setting CW technology is excellent for reclamation of sewage as well as remediation of Lake.



Successful production well operation in Srinagar

In past few years, several bank filtration schemes are being implemented in the Himalayan regions of Uttarakhand state in India. At Srinagar, a production well which was commissioned in 2011 has been running successfully for more than a year now and the success has encouraged Uttarakhand Jal Sansthan to drill more production wells in Srinagar as well as in many other hilly towns. The state government is willing to support UJS for the further development of RBF. Studies on water quality and hydrogeology are being carried out since the last one year at the RBF well-field site at Srinagar (WP-1 of Saph Pani).



The picture shows the Saph Pani team members from IIT Roorkee (Dr. InduMehrotra, Dr. Ankush Gupta and Mr. MedalsonRonghang), HTWD Germany (Dr. Thomas Grischek and Mr. Thomas Voltz), and Uttarakhand Jal Sansthan (Er. Rohila and staff) measuring some of the water quality parameters on-site and collecting water samples for subsequent analysis in labs at IIT Roorkee, India and Univ. of Applied Sciences Dresden, Germany.

Indo European Exposure Tour

The three day tour which was organized by the KompetenzzentrumWasser Berlin (KWB) took place from 30th of May to 1st of June. 22 participants visited some of the most important water treatment plants in the region of Berlin, Dresden and Braunschweig.

On the first day the water works Hosterwitz in Dresden was visited. Prof. Grischek explained the conjunctive use of natural water treatment with conventional pre-and post-treatment at the Elbe River.



Participants at water works Hosterwitz in Dresden

On the second day the water works Tegelwith the lakebank filtration at lake Tegel and pond infiltration,as well as the reed bed filters at lake Halensee where visited. The reed bed filters are used for the treatment of rainfall and urban run-off prior to discharge into the urban lake.



Inspecting the underground tanks at the reed bed filters

On the third day the sewage works Steinhof in Braunschweig was visited. The worldwide unique cycle from sewage treatment, open field irrigation prior to discharge in the river Oker, sprinkler irrigation and biogas production was explained by Andreas Hartmann, director of KWB.



Open field irrigation of treated wastewater at Braunschweig

Dissemination activities

Saph Pani was presented at IWA Conference on Decentralised Wastewater Management in Asia

The conference was held in November 2012 in Nagpur, India.

Saph Pani was presented at the National Conference on Water Quality Management at Malaviya National Institute of Technology Jaipur, Rajasthan, India

The conference took place on 20th and 22nd of December 2012.Saph Pani results were presented in five oral presentations.

Saph Pani present at the International Symposium for Managed Aquifer Recharge (ISMAR)

The Event will take place in Beijing on October 15-19, 2013. Saph Pani results will be presented in five oral presentations.

Two day training course on constructed wetlands for wastewater treatment and reuse

The training course will be held at the Indian Institute of Technology Bombay on 20-21 of November, 2013.



Project supported by the European Commission within the Seventh Framework Programme Grant agreement No. 282911

This publication reflects only the author's views and the European Union is not liable for any use that may be made of the information contained therein.

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