



DSDS Special Event
Water: Our global common
31st January 2012
New Delhi



Saph Pani - *Enhancement of natural water systems and treatment methods for safe and sustainable water supply in India*



Elango Lakshmanan
Professor
Dept. of Geology
Anna University
Chennai, India
www.elango.5u.com

Outline



- Background
- Partnership
- Project Objectives and Concept
- Project structure
- Chennai Case Study

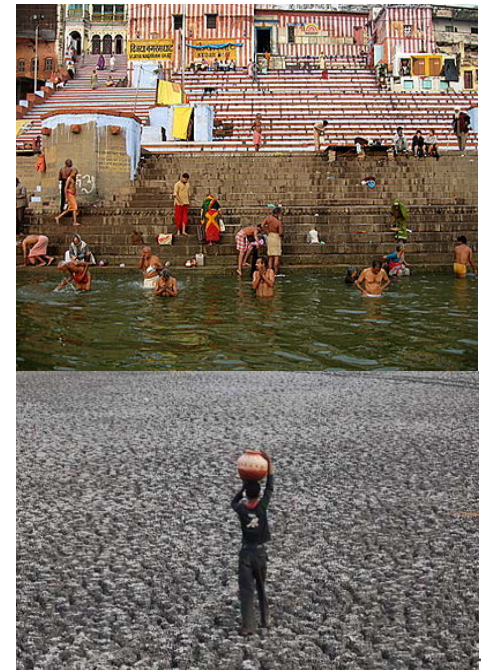
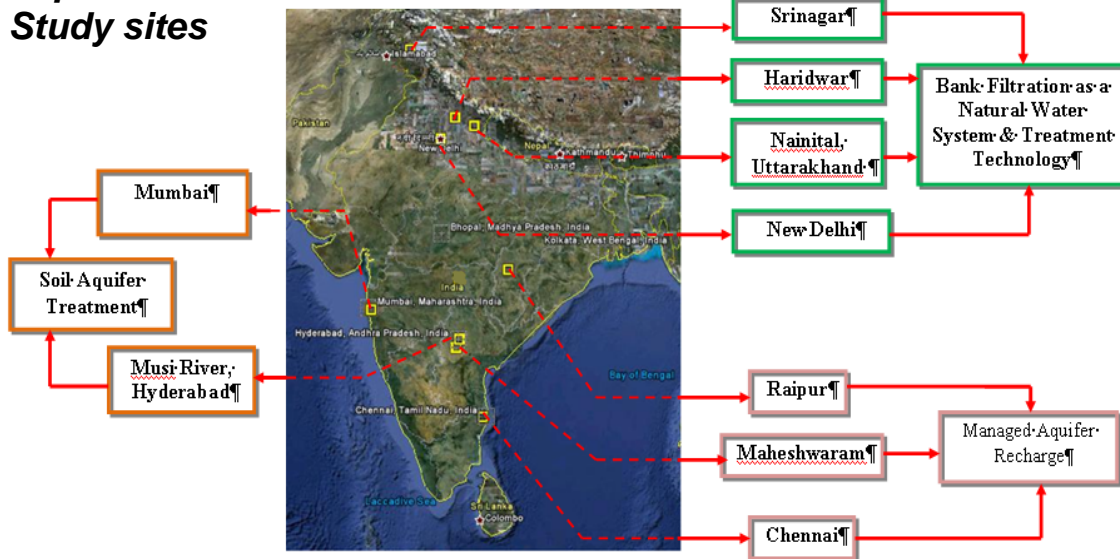
Saph Pani in brief



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

- a collaborative research project funded in FP7 of European Commission
- 20 project partners from academia, research centres and industry (>50% Indian partners)
- total budget 4.7 Mio EUR , EC funding ca. 3.5 Mio EUR
- start 1 October 2011, 3 years duration

Saph Pani – Study sites





Partnership



No.	Institute/Organisation	Country
1	University of Applied Sciences Northwestern Switzerland	Switzerland
2	Uttarakhand Jal Sansthan	India
3	National Institute of Hydrology	India
4	IIT Roorkee	India
5	Veolia Water India	India
6	Anna University	India
7	SPT consultants (SME)	India
8	Raipur Municipal Cooperation	India
9	Akshay Jaldhara (SME)	India
10	National Geophysical Research Institute	India
11	IIT Bombay	India
12	DHI (India) Water & Environment Pvt Ltd	India
13	Competence Centre for Water Berlin	Germany
14	BRGM Service Eau	France
15	Centre of environmental management and decision support	Austria
16	University of Applied Sciences HTW Dresden	Germany
17	UNESCO IHE Delft	Netherlands
18	International Water Management Institute	Sri Lanka
19	Commonwealth Scientific and Industrial Research Land and Water	Australia
20	Freie Universität Berlin	Germany

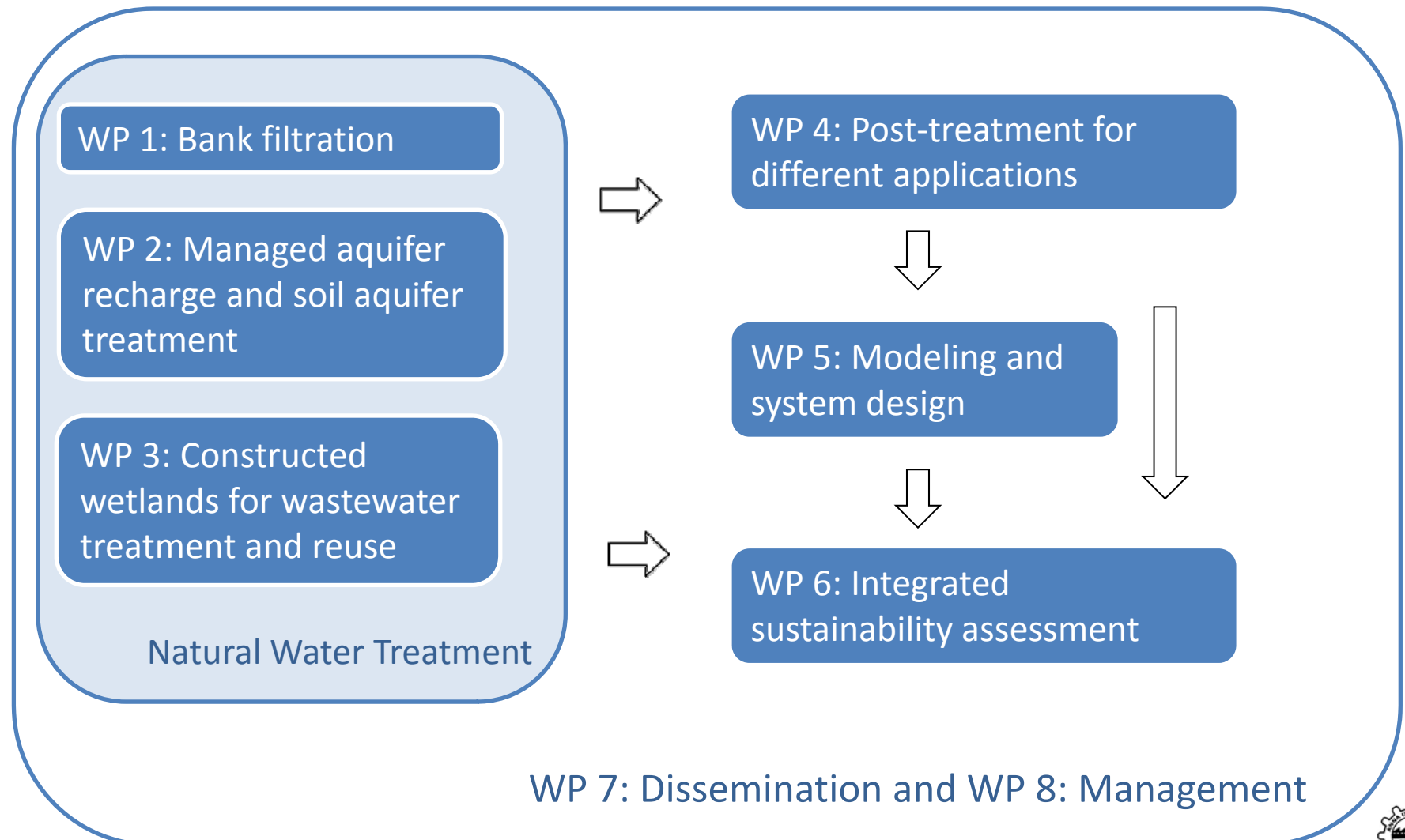


Objectives of the project

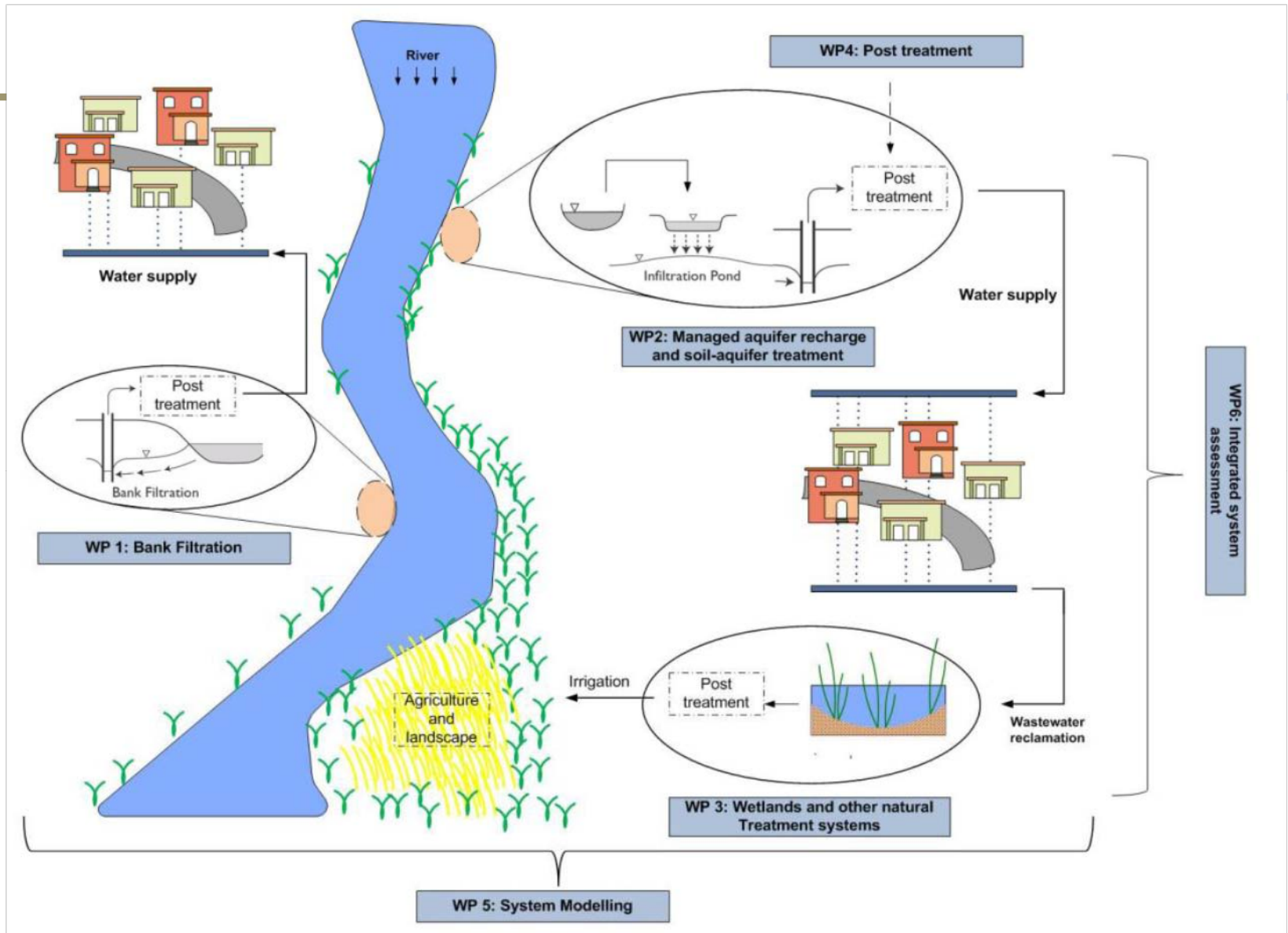


- Improve scientific understanding of the performance and determining processes occurring in natural treatment processes (managed aquifer recharge and wetlands)
- Study of fate and removal of important water quality parameters such as pathogenic microorganisms and faecal indicators, organic chemicals, nutrients and metals
- Investigate hydrological characteristics (infiltration and storage capacity) and eco-system functions
- Improve water resources management strategies (e.g. by providing buffering of seasonal variations in supply and demand)
- Evaluate the socio-economic value of natural water treatment, taking into account long-term sustainability and comprehensive system risk management.

Project structure

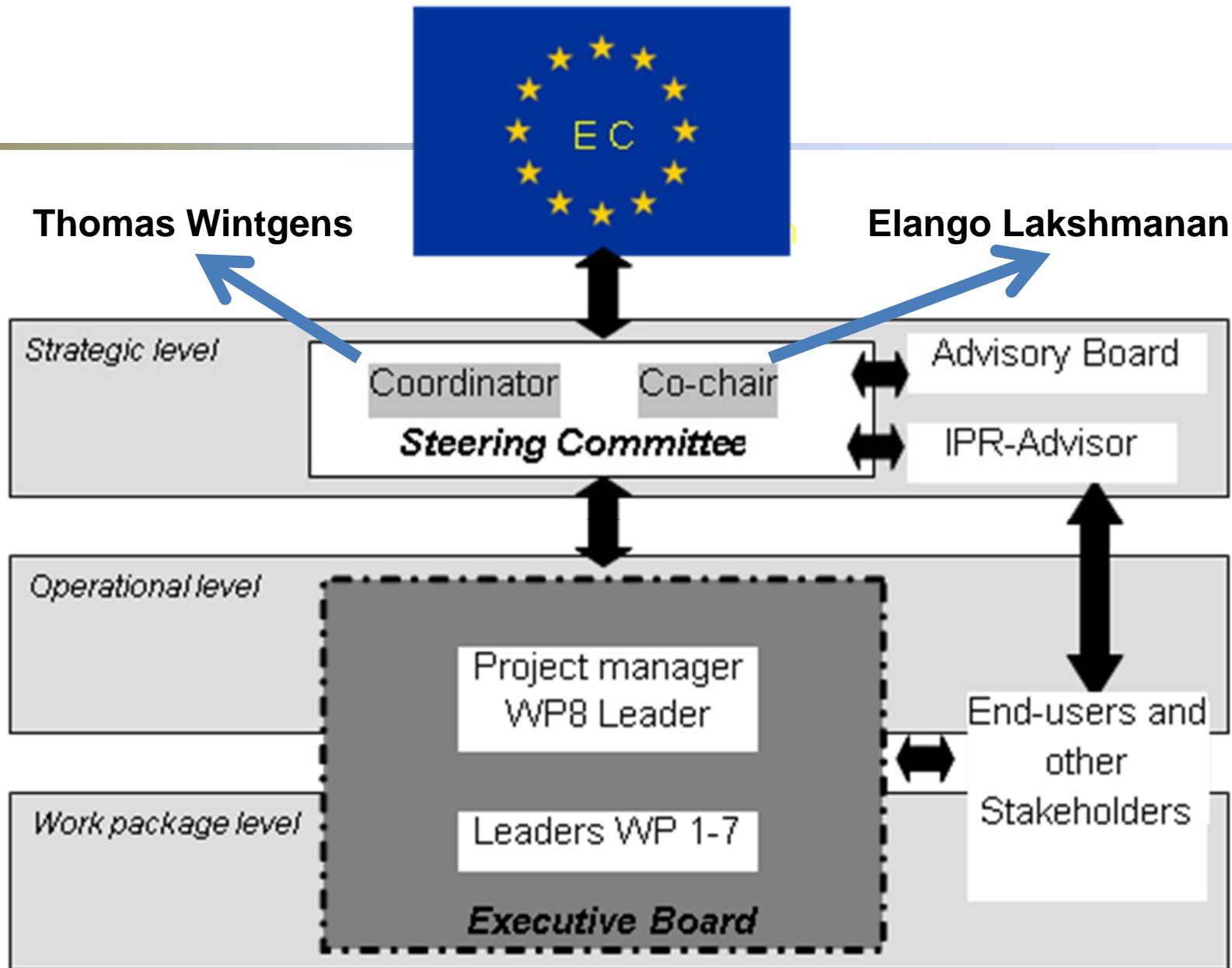


Project concept

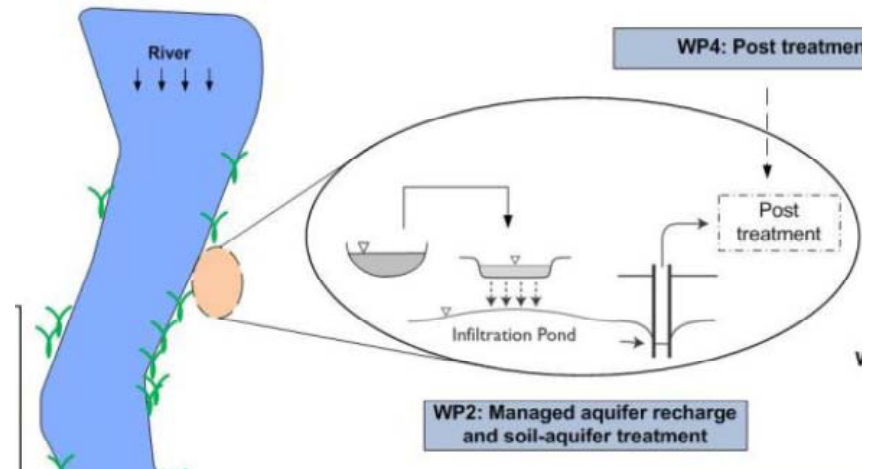


	Bank Filtration		Managed Aquifer Recharge			(constructed) Wetlands	
Case study site	Haridwar & Srinagar, Nainital	Delhi (Yamuna)	Maheshwaram (Hyderabad)	Chennai	Raipur	Mumbai	Musi river watershed
Site partner	UJS, IITR	Veolia, IITR	BRGM, NGRI	ANNA, SPT	RMC	IITB	IWMI
WP1	flooding, turbidity & pathogens	poor quality, nitrogen, organics					
WP2			Hard rock, overexploitation, trace organics	saltwater intrusion, over-exploitation	SAT, renovation of traditional water preparation		
WP3						Urban, Wetland	Periurban, Natural Wetland, SAT
WP4	Case study	Case study			Case study		Case study
WP5	Modeling RBF,	Modeling reactive transport	M. groundwater flow MAR crystal-line basement and, reactive transport	Modeling saline intrusion			Modeling of surface-groundwater interaction
WP6		Data site BF	Data site MAR			Data site Wetlands I	Data Site Wetlands II

Project Organisation



WP 2 - Managed Aquifer Recharge – Chennai Case Study



Chennai

- Formerly MADRAS
- 4th Largest city
- **Population**
7,413,779
- Area: 174 km²
- Rainfall - 1260 mm/year



Image: Google

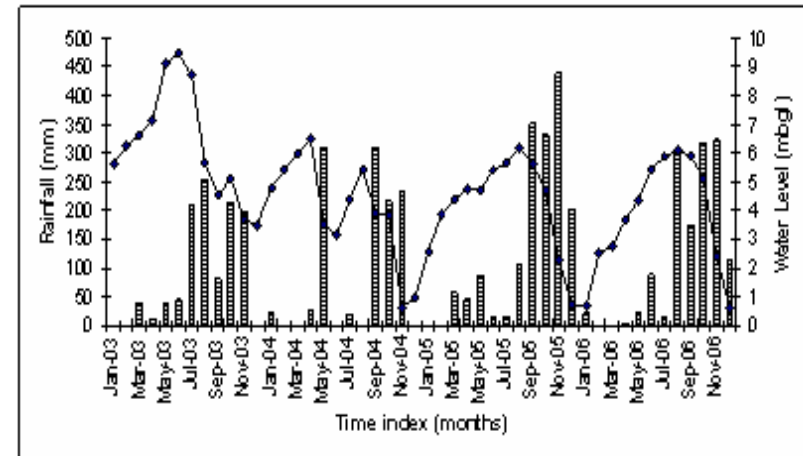
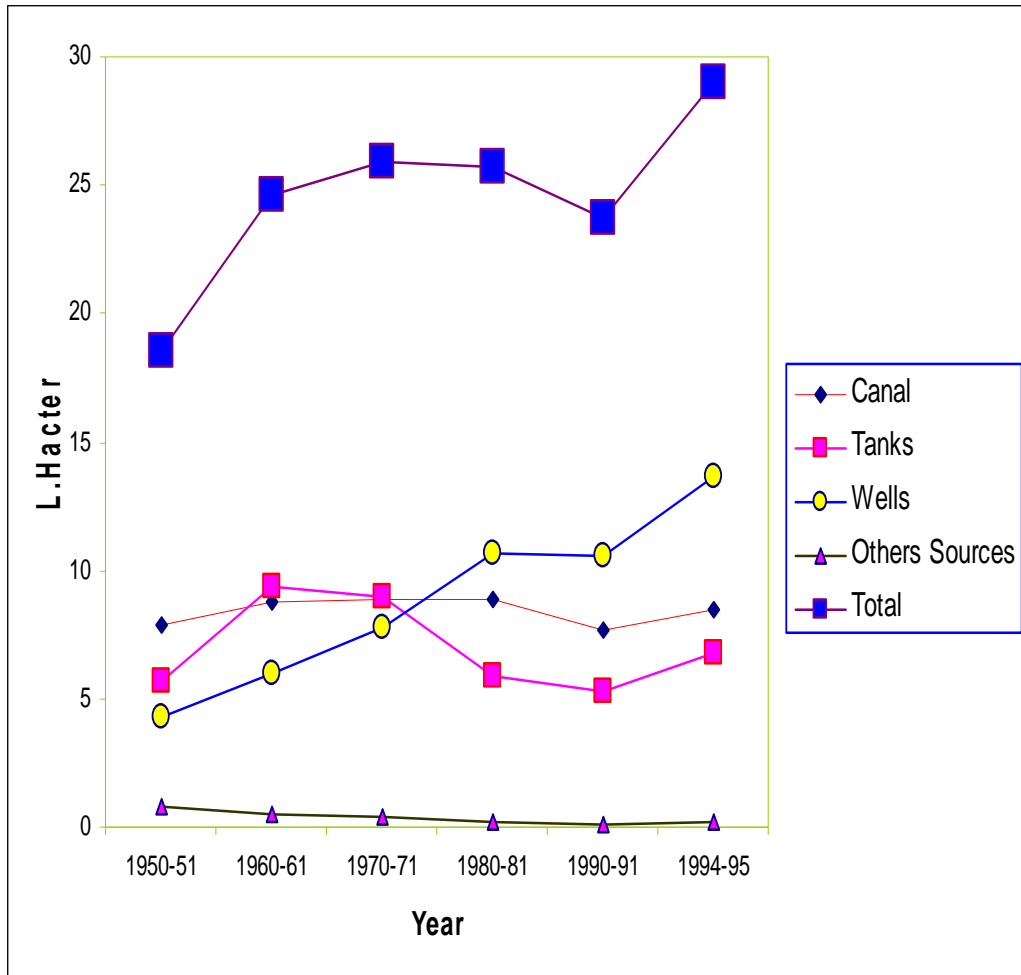


Water requirement :

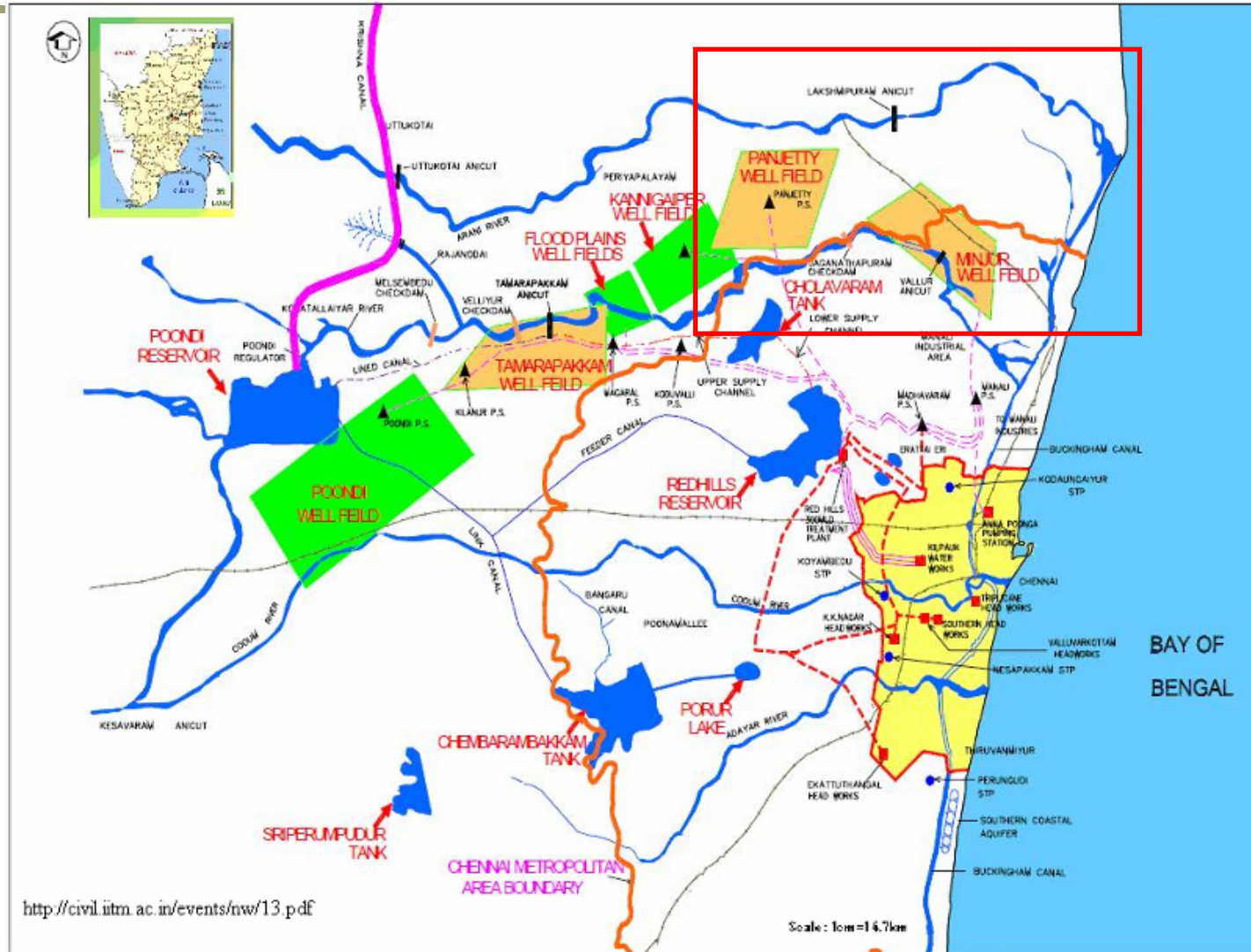
- ❖ Reservoirs (a few around and one at 160km!
- ❖ Groundwater – from North and South of city
- ❖ Two Desalination plants coming up!

Image: Wikipedia

Source of water for Irrigation and monthly variation in rainfall

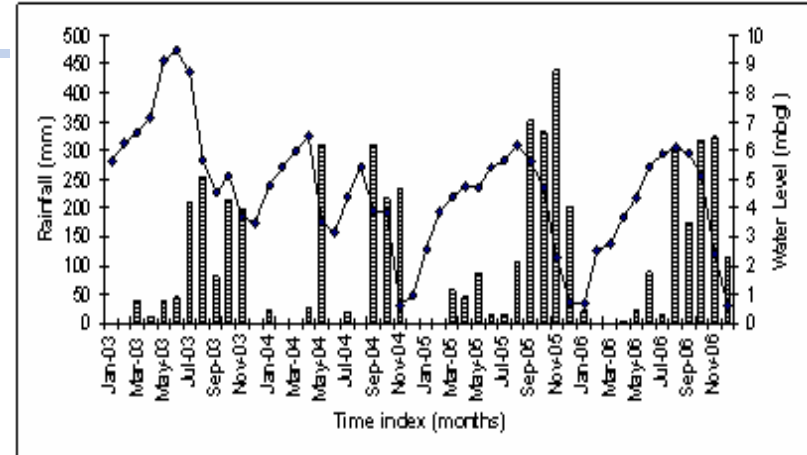
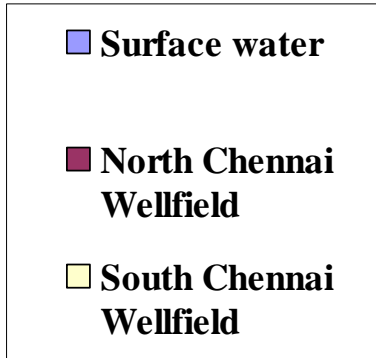
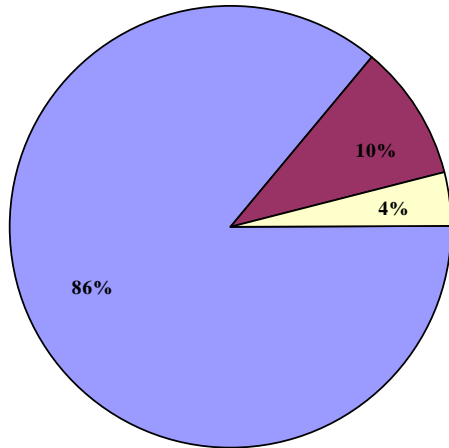


Location of reservoirs & well fields

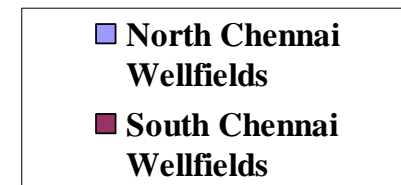
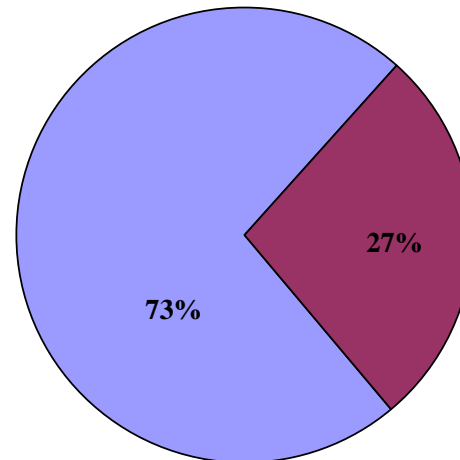


Groundwater contribution to city's water supply

Supply 2010



Groundwater Supply



The problem - Seawater intrusion

Objectives

Study and assess the current situation

Assessment of MAR as a mitigation measure

Methodology

Geological and hydrogeological studies - (Drilling, Pumping tests, Resistivity tomography, monitoring wells)

Study of impact of a check dam as MAR

Construction of pilot site (Percolation pond)

Groundwater and surface water modelling

Some photographs



13°13'36.13" N 80°18'03.47" E elev 4 m



Electrical resistivity methods for assessment

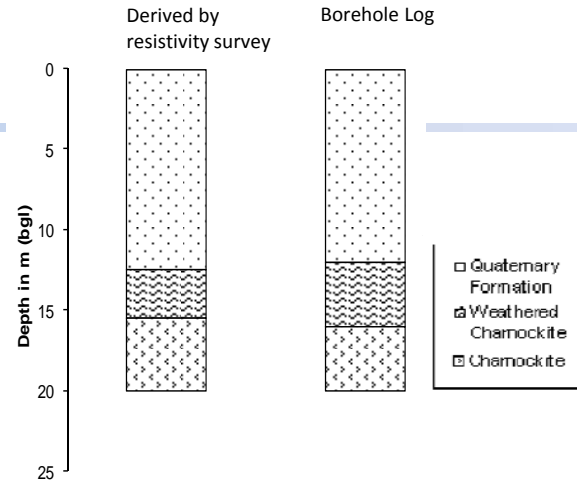
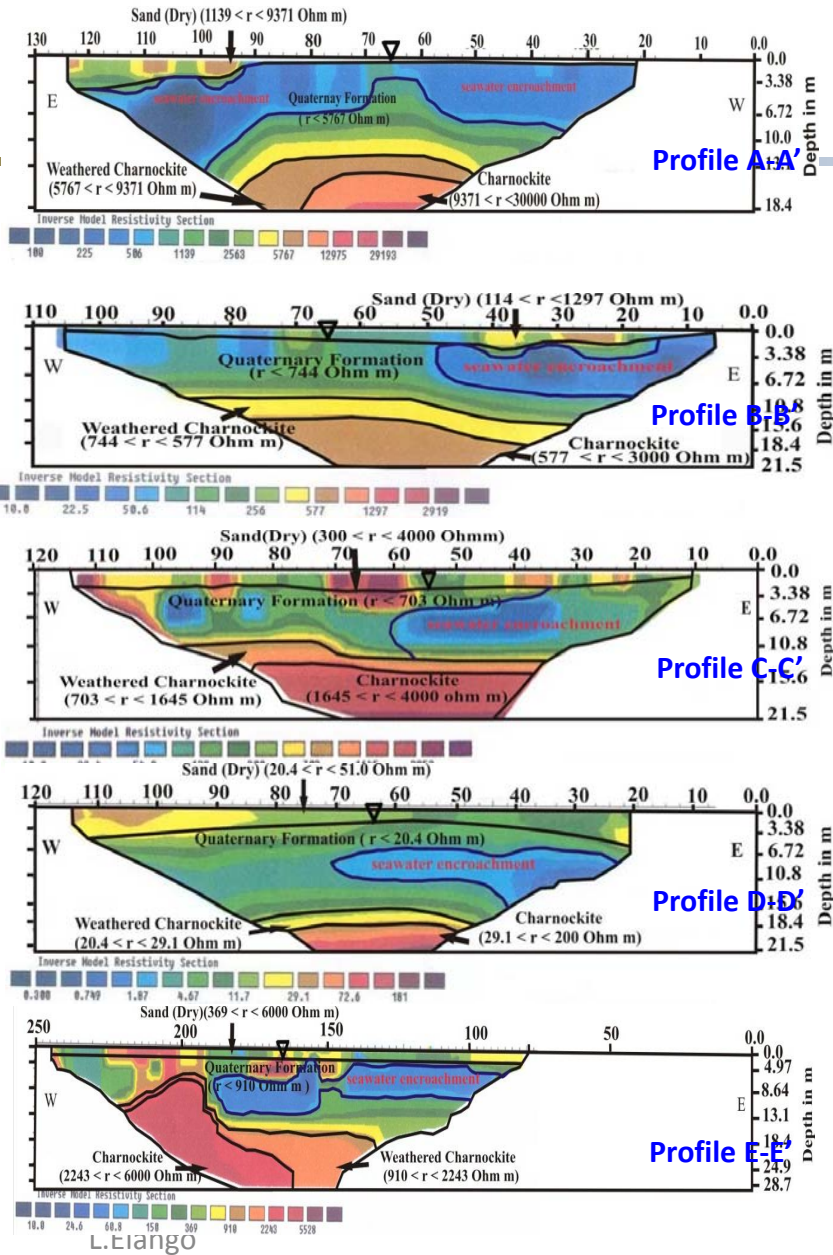


Figure 9 Litholog derived from 3D subsurface model

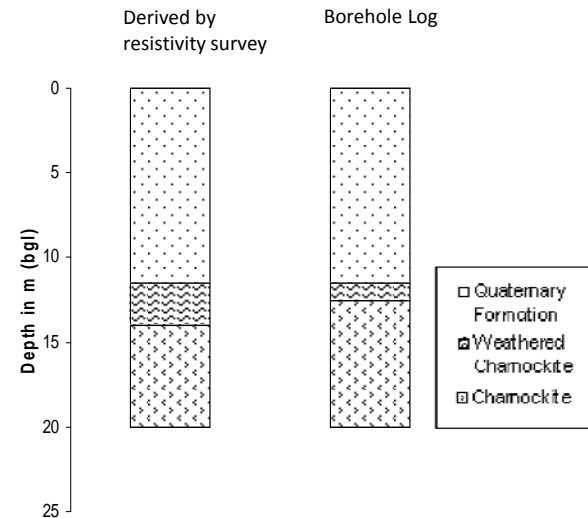
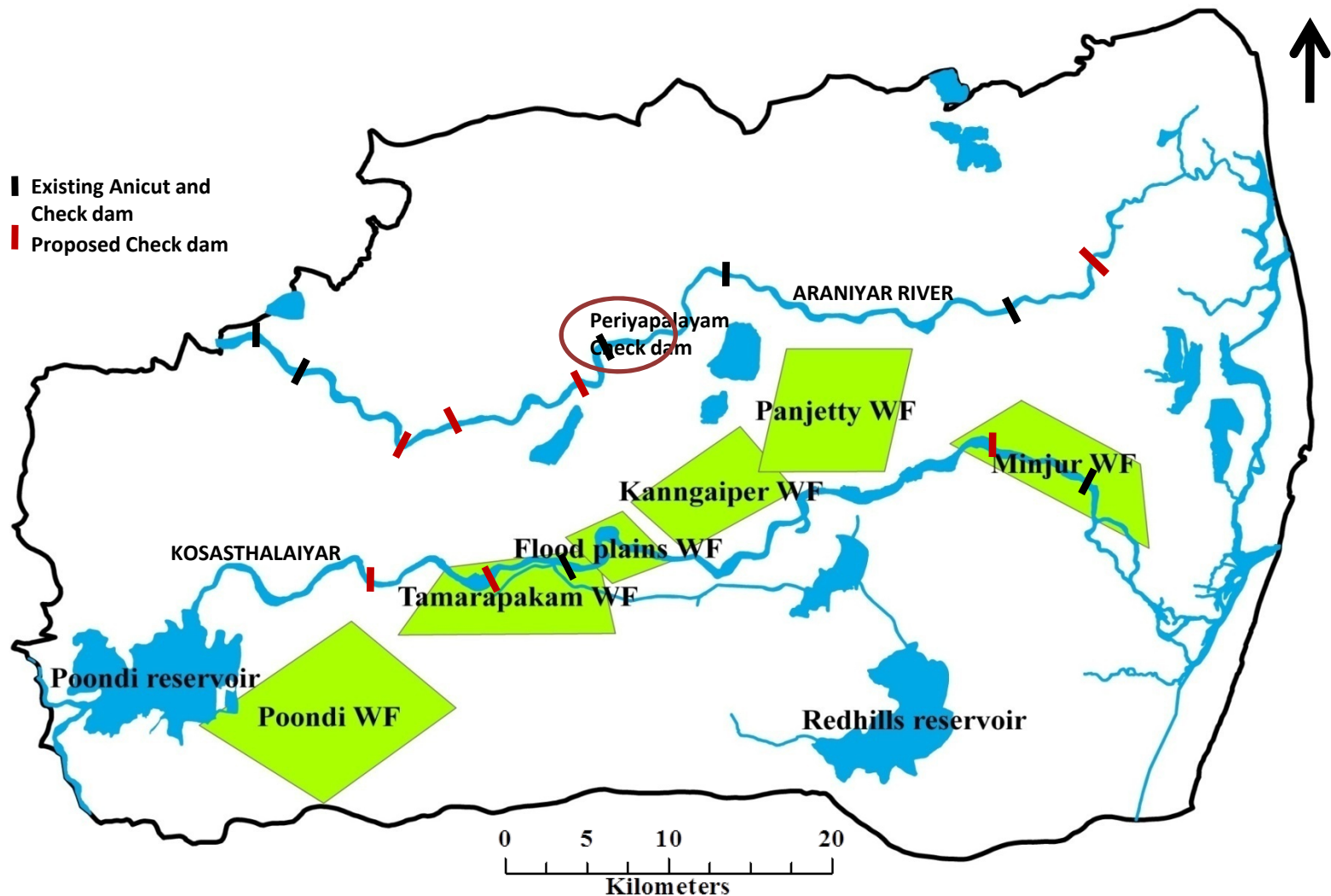


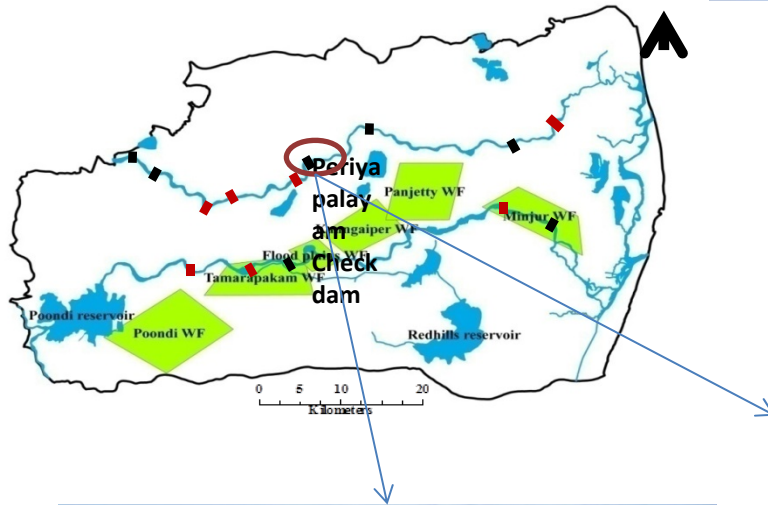
Figure 12 Litholog derived from 3D subsurface model

Sathish et al (2011) IJEST

Location of check dams



Study on impact of a check dam

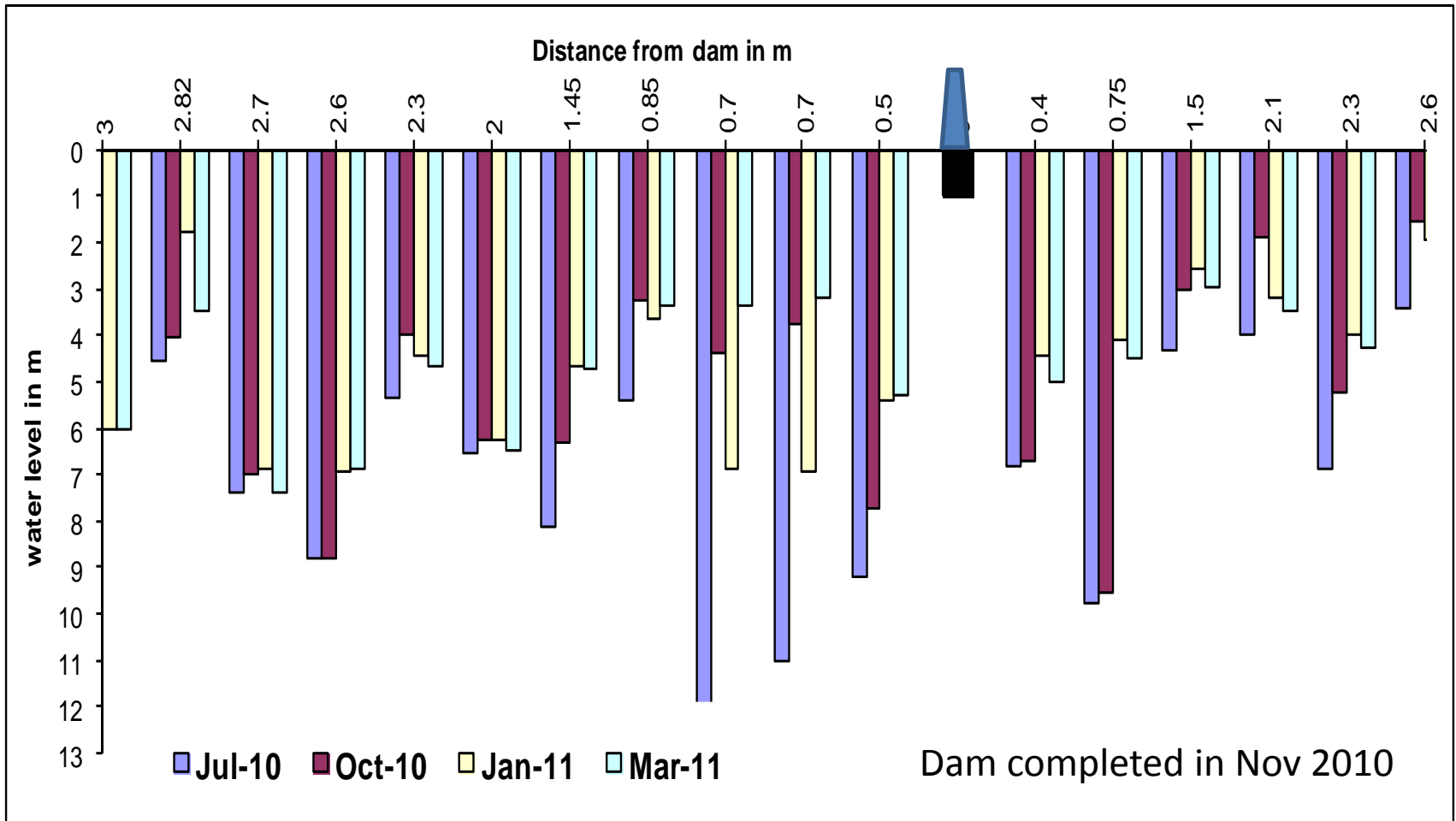


Check dam in October
2010(Surface water storage 128
Mcft)



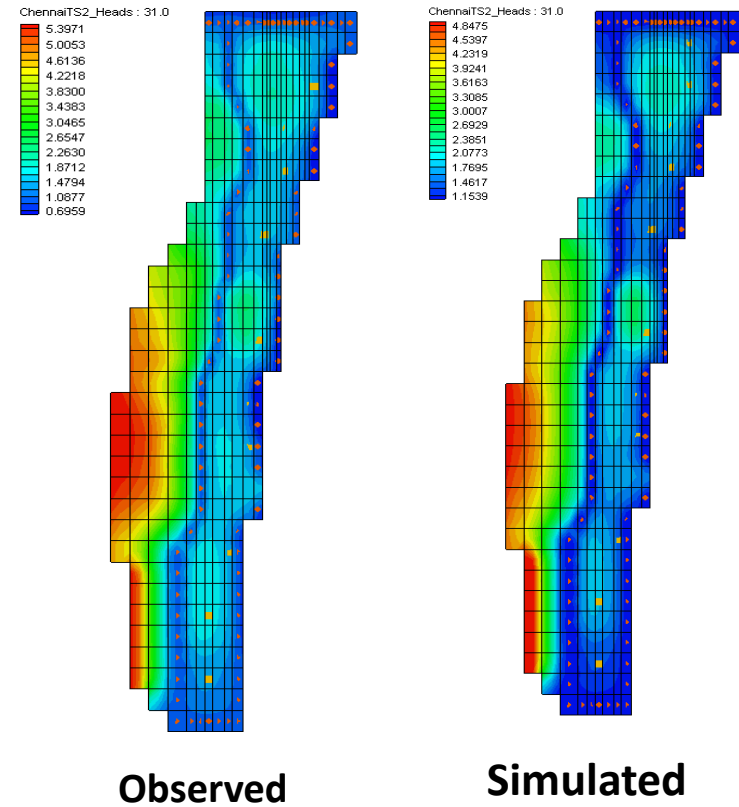
Check dam in July 2010

Increase in groundwater level due to a check dam



Modelling

For assessing the impact of MAR on mitigating seawater intrusion



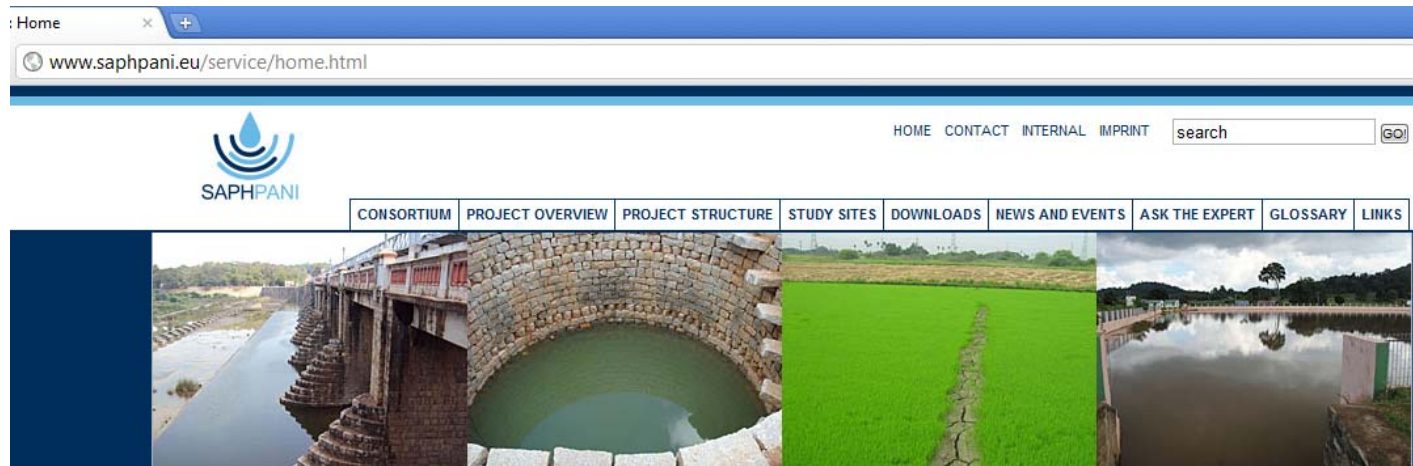
Expectations...



- Accomplish scientific objectives: knowledge, results, publications, degrees
- Demonstrate successful EU-India cooperation
- Learn from each other
- Provide visibility to the project: dissemination, training, exploitation
- Provide the research support to solutions implemented in “real life”

Project web site

www.saphpani.eu



WELCOME

to the web page of Saph Pani. Saph Pani's full name is Enhancement of natural water systems and treatment methods for safe and sustainable water supply in India. It 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, Europe, Sri Lanka and Australia.

Saph Pani addresses the improvement of natural water treatment systems such as river bank filtration (RBF), managed aquifer recharge (MAR) and wetlands in India building on a combination of local and international expertise. The project aims at enhancing water resources and water supply particularly in water stressed urban and peri-urban areas in different parts of the sub-continent. The project focuses on a set of case study areas in India covering various regional, climatic, and hydrogeological conditions as well as different treatment technologies.

We invite you to explore the different aspects of the project, the world of natural water treatment and the study sites.

NEWS

16 of January 2012

DHI-WASY INFORMS PARTNERS IN GERMAN

DHI-WASY informs partners in German about the Saph Pani project and the successful Kickoff-Meeting...

A collaborative project funded in the 7th Framework Program. Grant Agreement no: 282911 Project duration: 10/2011-10/2014



Thank you for your attention!



Acknowledgements

Project co-funding by the European Commission within the Seventh Framework Programme under Contract No. 282911

Prof. Thomas Wintgens, Project Coordinator, Dr Nättorp Anders, Project Manager and all project partners

WP2 Chennai Project Team - Parimala, Indu , Suganthi, Brindha



- elango@annauniv.edu
- elango34@hotmail.com