

## Groundwater Protection in India Depends on the Policy-Practice Feedback Loop

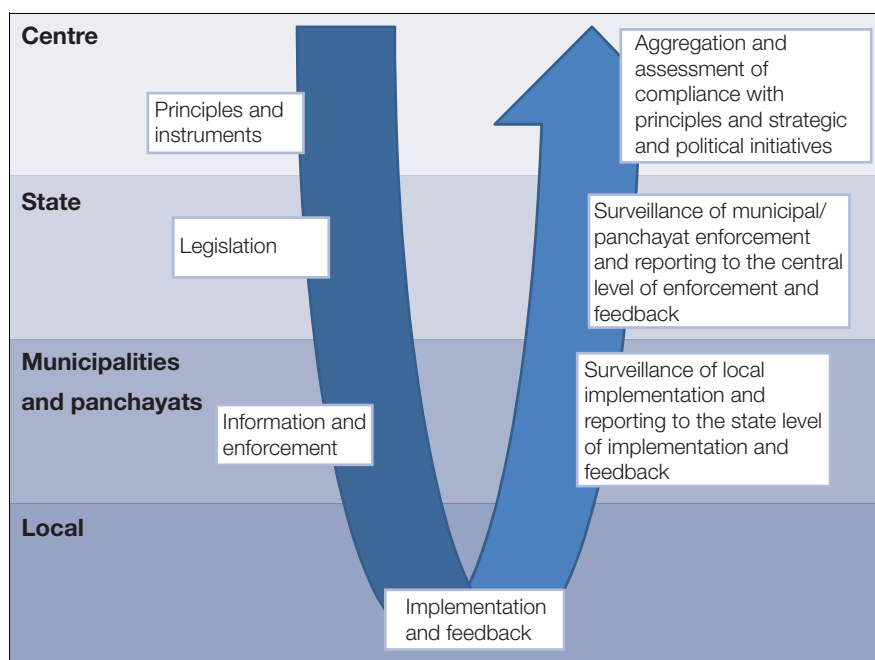
**Groundwater protection is key to a sustainable future for India. This study proposes a revised groundwater management model and a road map for adapting selected EU policies, strategies, and instruments for managing groundwater to India's needs.**

The model allows for decentralization while ensuring enforcement at all levels according to common principles. Decentralized reporting—aggregated from level to level—ensures transparency in implementation. Conveying feedback as a return stream in the model is essential, as it allows for correction (fixing something that is not working) and prevention (introducing new initiatives to ensure future function, including upstream measures).

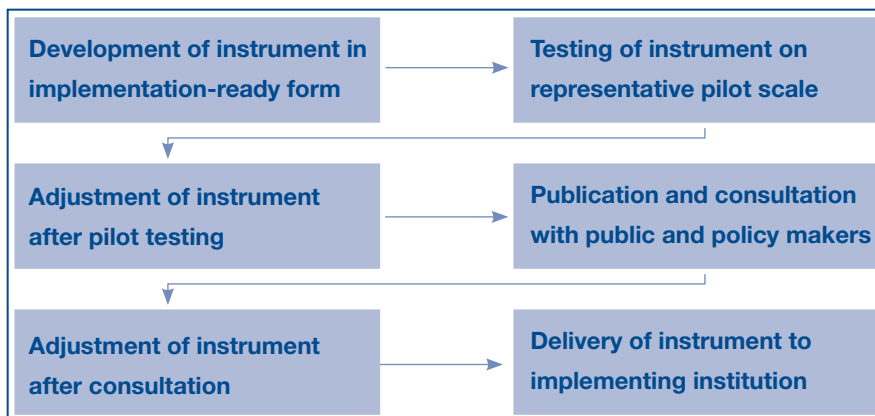
The model also allows for a central overview and transparency—of implementation, achievements, and shortcomings—and the need for additional initiatives at the policy and strategy level. The suggested model provides crucial feedback on implementation and on lessons learned, without undue filtering, to allow for policy reformulation and for identifying adequate, high-impact upstream measures.

Additionally, it is recommended that the government develops and implements improved instruments supporting the model that follows a general road map.

### Distributed and surveyed management model of groundwater protection



### General road map for instrument level development, improvement and demonstration



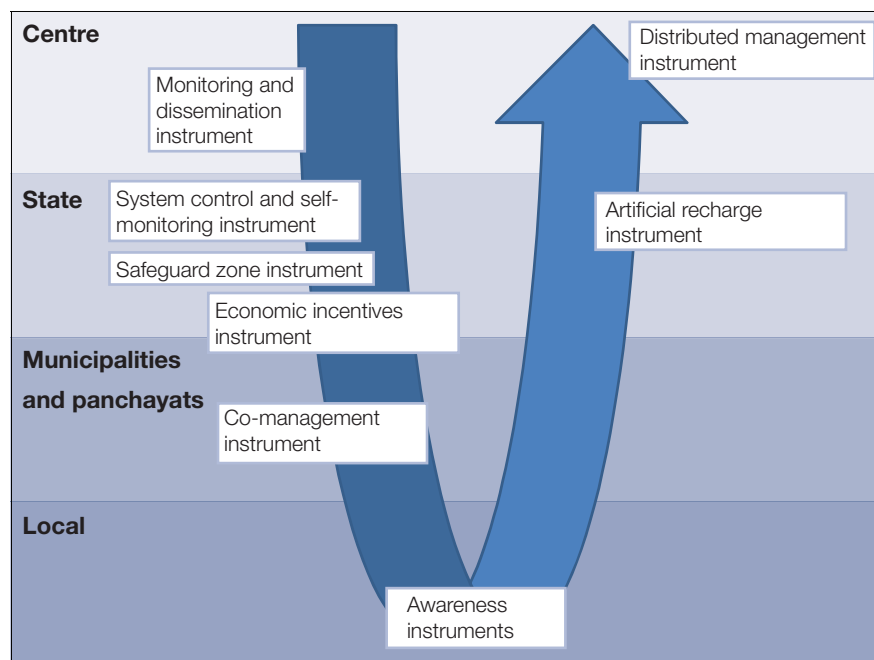
## Instruments suggested for improving groundwater management in India

To deal with the groundwater challenges in India, the following instruments based on EU practice and experience may be useful.

- A management model supporting the coordination and integration of the existing groundwater and pollution boards at the Centre and states
- Results of monitoring disseminated and effectively used for identification of need for actions
- Potential of remote sensing/geographic information system (GIS) tools fully used
- Enforceable methods for planning and controlling credible self-monitoring by potentially polluting industries, based upon the compliance point approach
- Guidance for safeguard and well-head protection zones for drinking water resources of villages, towns and cities to prevent pollution
- Economic incentives for reduction of groundwater abstraction and promotion of low water consumption crops
- Participatory, awareness and co-management tools for reduction of groundwater abstraction and pollution
- Templates for public awareness campaigns in urban and semi-urban areas
- Feedback-based guidance for artificial recharge to ensure the most feasible practice

More detailed suggestions for the road map are given in the full project document.

## Instruments supporting the distributed management model suggested for road map development and demonstration



## Actions facilitating the improvement of groundwater management in India

- Appoint a nodal agency to integrate all monitoring programmes into one cost-efficient programme
- Universities, research institutions, and laboratories to operate parts of the groundwater monitoring system under public contract and control
- Strengthen surveillance and accountability of well registration and permits
- Support capacity building and training for governmental and non-governmental organizations
- Enhance public awareness about groundwater as a resource owned by one but affecting many

- Dedicate power feeder lines for irrigation in states, as in Gujarat, to introduce economic incentives to reduce groundwater abstraction
- Increase staff strength of pollution control boards and training in effective control of industrial discharge that pollutes groundwater

It is further recommended that the EU-India dialogue continues the exchange of ideas and technology in water resources management for mutual benefit.

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For the full document, please consult the project's website



## EU Groundwater Management Status

EU has a long history of addressing groundwater quantity and quality challenges in the form of policies and instruments protecting groundwater:

- Groundwater legislation is part of and influenced by general water legislation
- EU legislation prescribes decentralised implementation on member state level, which is monitored and controlled by the EU
- Legislation on agricultural and industrial production and technologies takes groundwater and its pollution into account
- Safeguard/well head protection zones for delineating drinking water relating to contamination are enforced stringently
- Effectiveness of policy instruments on well registration, permits, and economic incentives are monitored
- Comprehensive groundwater data collection, storage and online retrieval systems is practised
- Principles of recovery of costs, polluter pays and self monitoring are widely applied

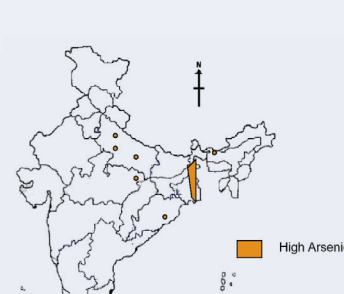
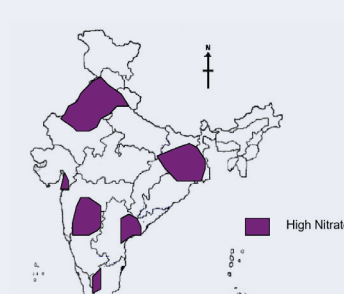
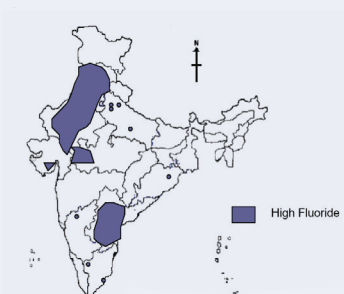
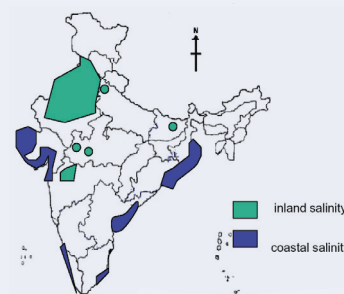
## India Groundwater Management Status

India has a well-developed regulatory framework supported by strong institutions and qualified staff. Still, the magnitude of the challenges is great:

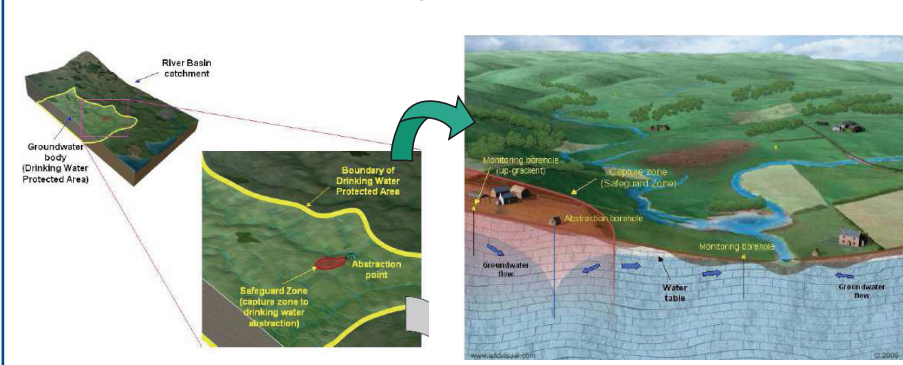
- The exploitation of groundwater is unsustainable and there is already a noticeable reduction in the resource
- Pollution is deteriorating groundwater quality
- Groundwater resources are subject to geogenic constraints
- Enforcement of legislation against pollution and over-extraction is weak
- Monitoring does not support planning and control in groundwater management sufficiently

There is evidence of a strong drive towards improving groundwater management in India, addressing issues in an integrated way. The concern for the sustainability of urban areas and the subsistence of rural populations prompts review of legislation and enforcement and land and water rights.

## Groundwater pollution maps of India



## Groundwater body based management with application drinking water protected zones and safeguard zones



## EU-India Action Plan Support Facility – Environment

This project is funded by the European Union and implemented by Euroconsult Mott MacDonald, Arnhem, The Netherlands, in consortium with DHI, WWF, CEE, Toxics Link and TERI.

The Ministry of Environment and Forests represents the Government of India as counterpart for the implementation of the project.

The project period is from December 2007 until April 2011.

The objectives are:

- Improved sector policy analysis and knowledge
- Enhanced mutual understanding and cooperational links and dialogue
- Enhanced regulatory function and improved technical and institutional capacity of the Indian administration
- Enhanced dialogue, information exchange and awareness among civil society's organisations

The areas covered by the project are waste, chemicals, water, air, and climate change.

Project activities to develop the policy dialogue between India and the EU include advisory services, workshops, seminars, training, studies, and capacity building.

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### Some Other Activities of the EU-India Action Plan Support Facility

- Integrated Water Resource Management Workshops held in Kerala. An action plan for the Pamba river basin and a replicable model for intra-state river basin management will be produced.
- A Water and Environment Expertise Database has been created using learnings from the EU.
- In-depth analysis conducted and workshops held on e-waste management and remediation of contaminated sites.
- Training of trainers on international legislation for chemicals management conducted in Hyderabad, Amritsar, and Kanpur.

More information including background documents can be sourced from the project's website.

