Ground Water Realities- Concepts In Treated Water

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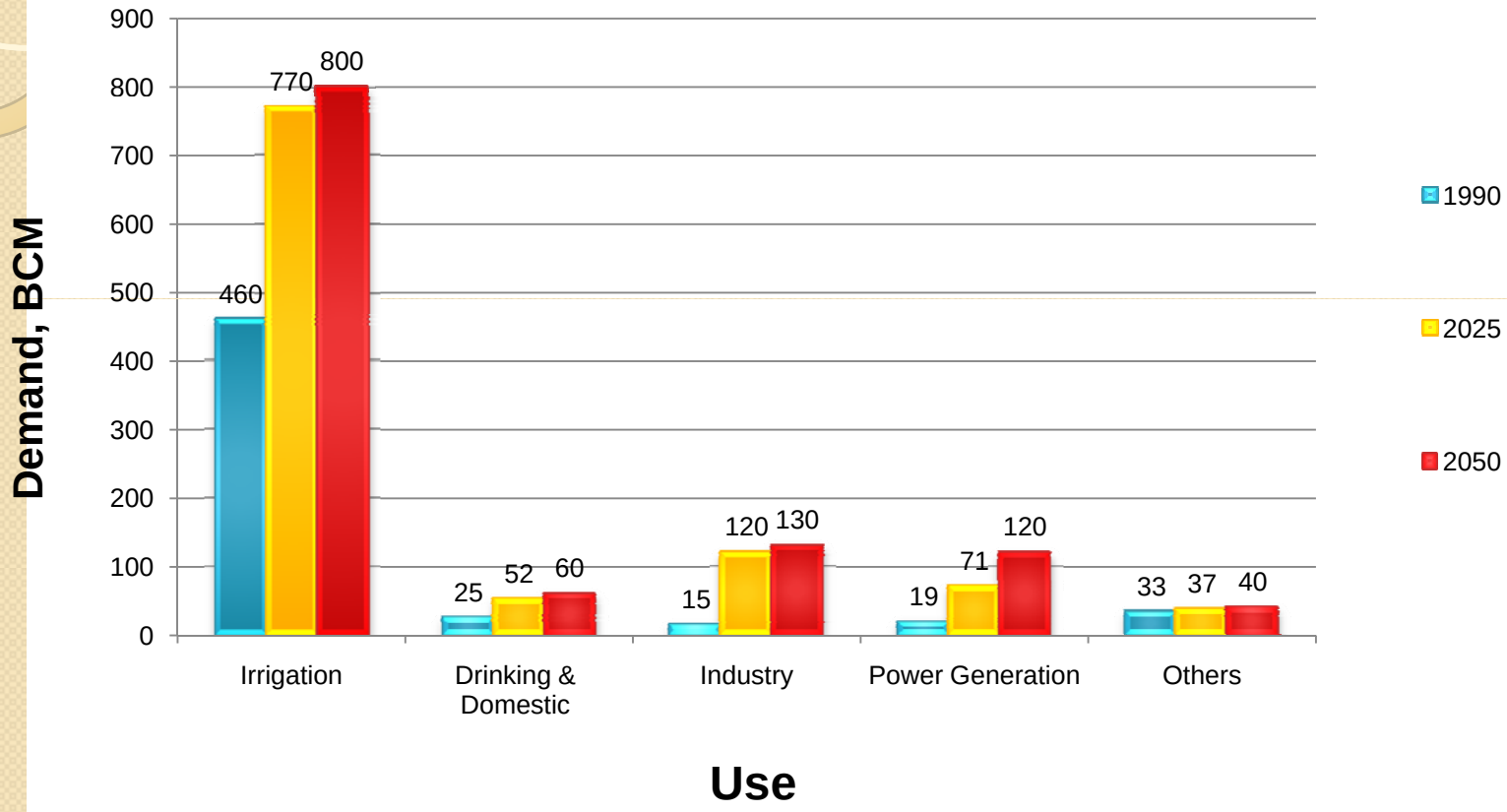
Some Salient Features:

- Annual Usable Ground Water Resource: 432 Billion Cubic Metre. (BCM).

- Per Capita Availability of Water: 2200 m^3 1991.
  1829 m^3 2002.
  1340 m^3 2025 (Estimated).
  1140 m^3 2050 (Estimated).

- Ground Water provides- 80-90% domestic water supply in rural areas.
  50% water supply in Urban & Industrial areas.
  50% of total irrigated areas through 17 Million energized tubewells.

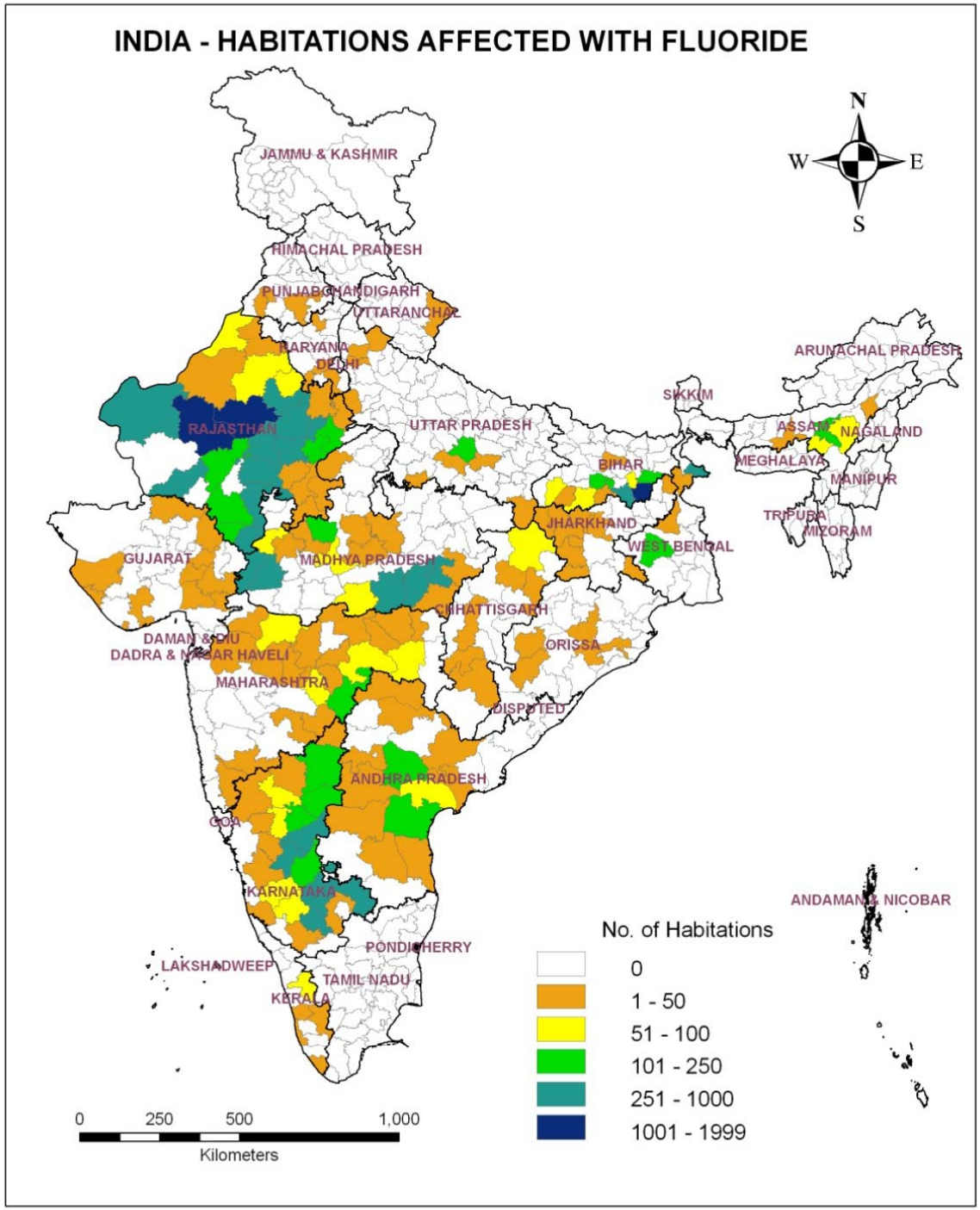
Water Use in India:



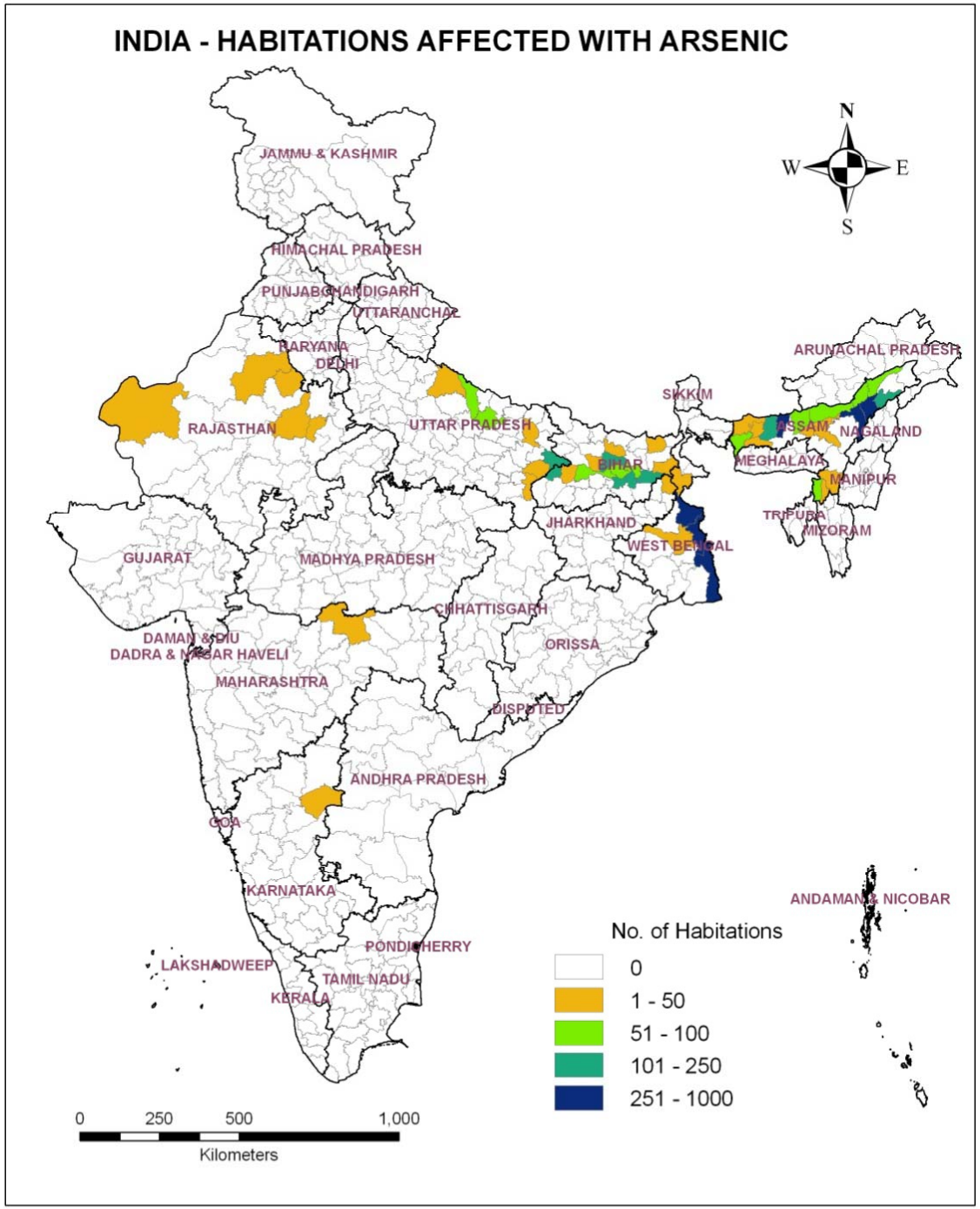
Water Demand for Different Uses (Source: MOWR 2002)

Impact of Ground Water Withdrawal:

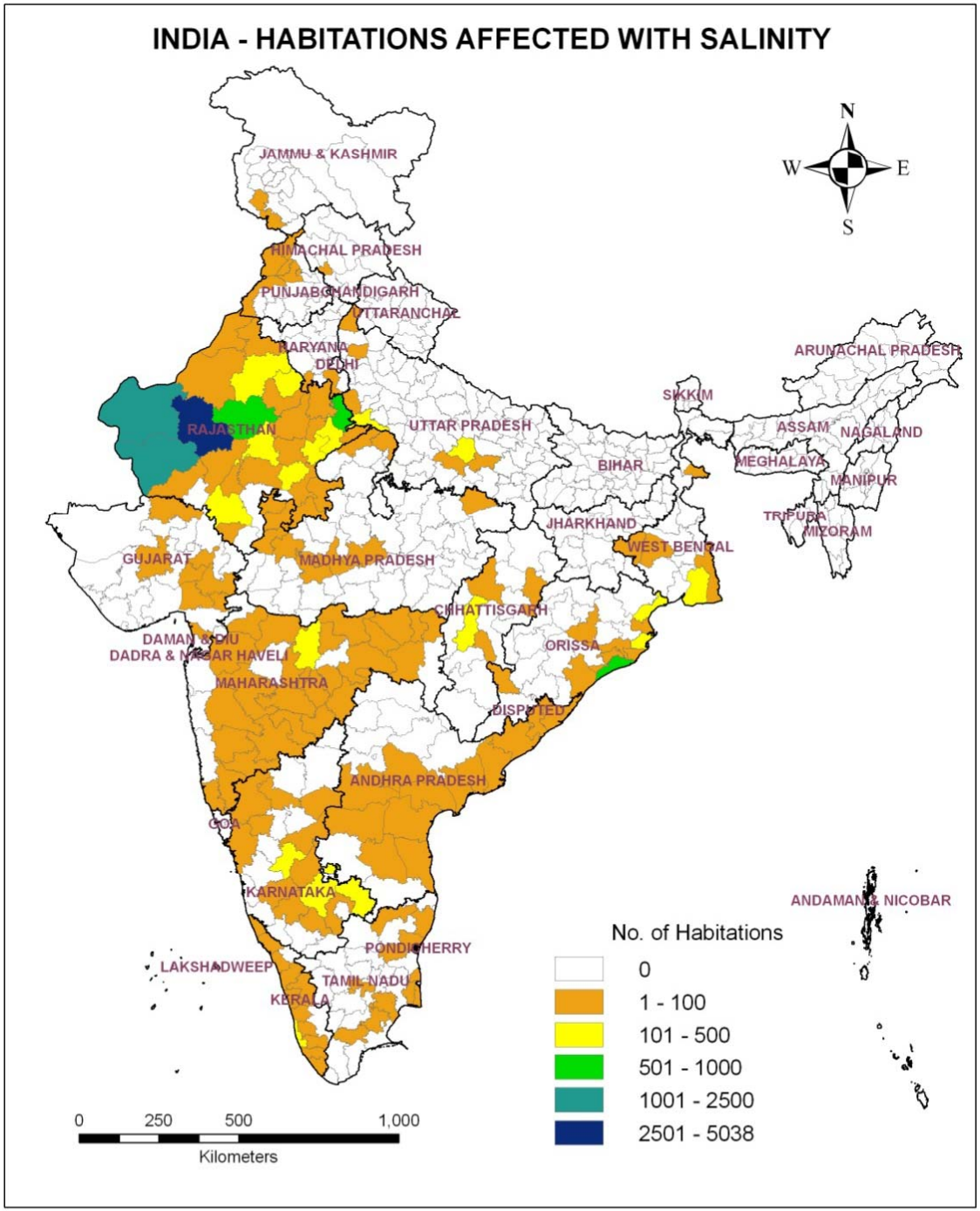
- Drying up of wells.
- Lowering of water level.
- Salt water Intrusion.
- Drying up of Rivers which receives dry weather flows from Ground Water.
- Ground Water Quality degradation.



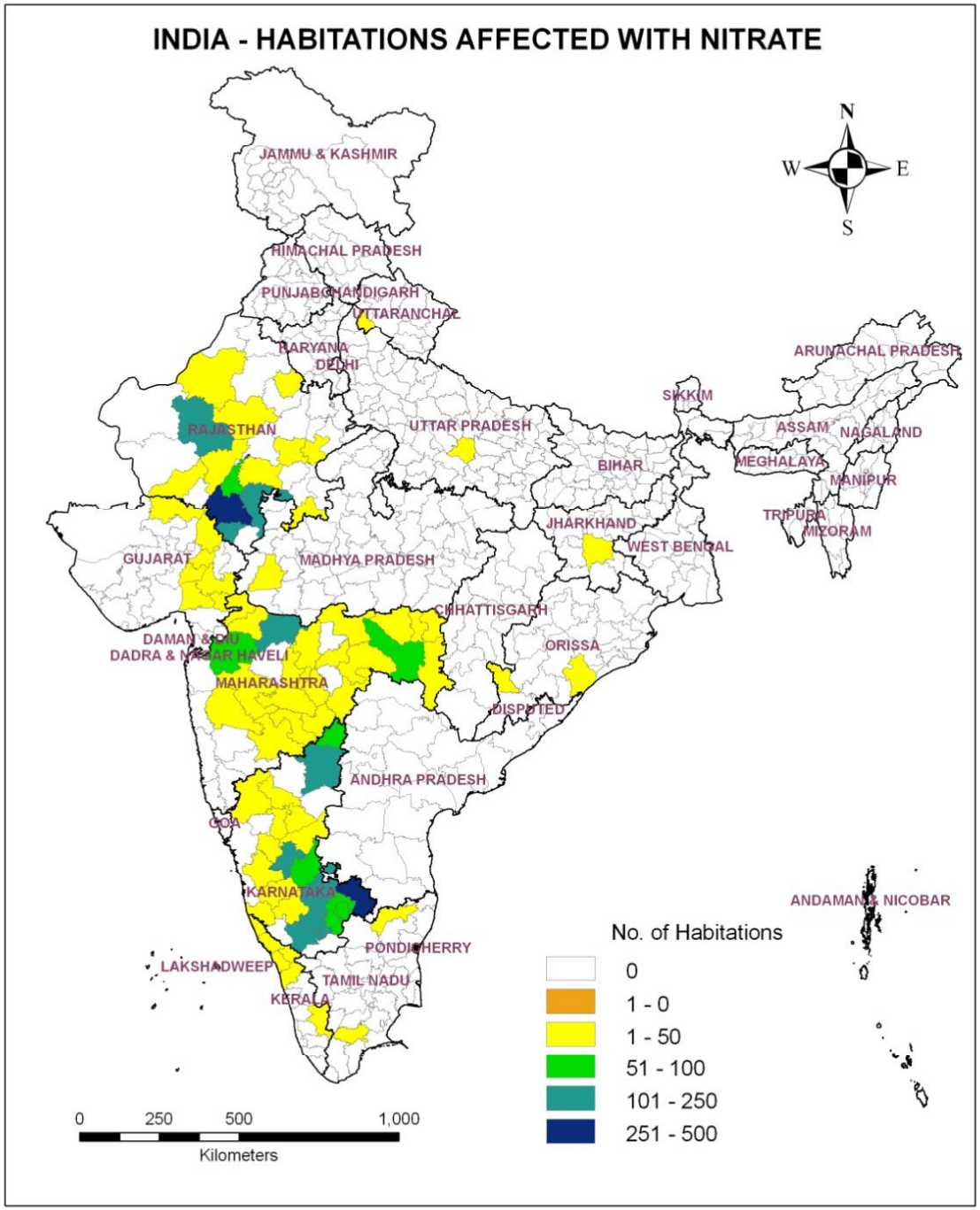
Fluoride Affected habs as on 01.04.2011



Arsenic Affected habs as on 01.04.2011

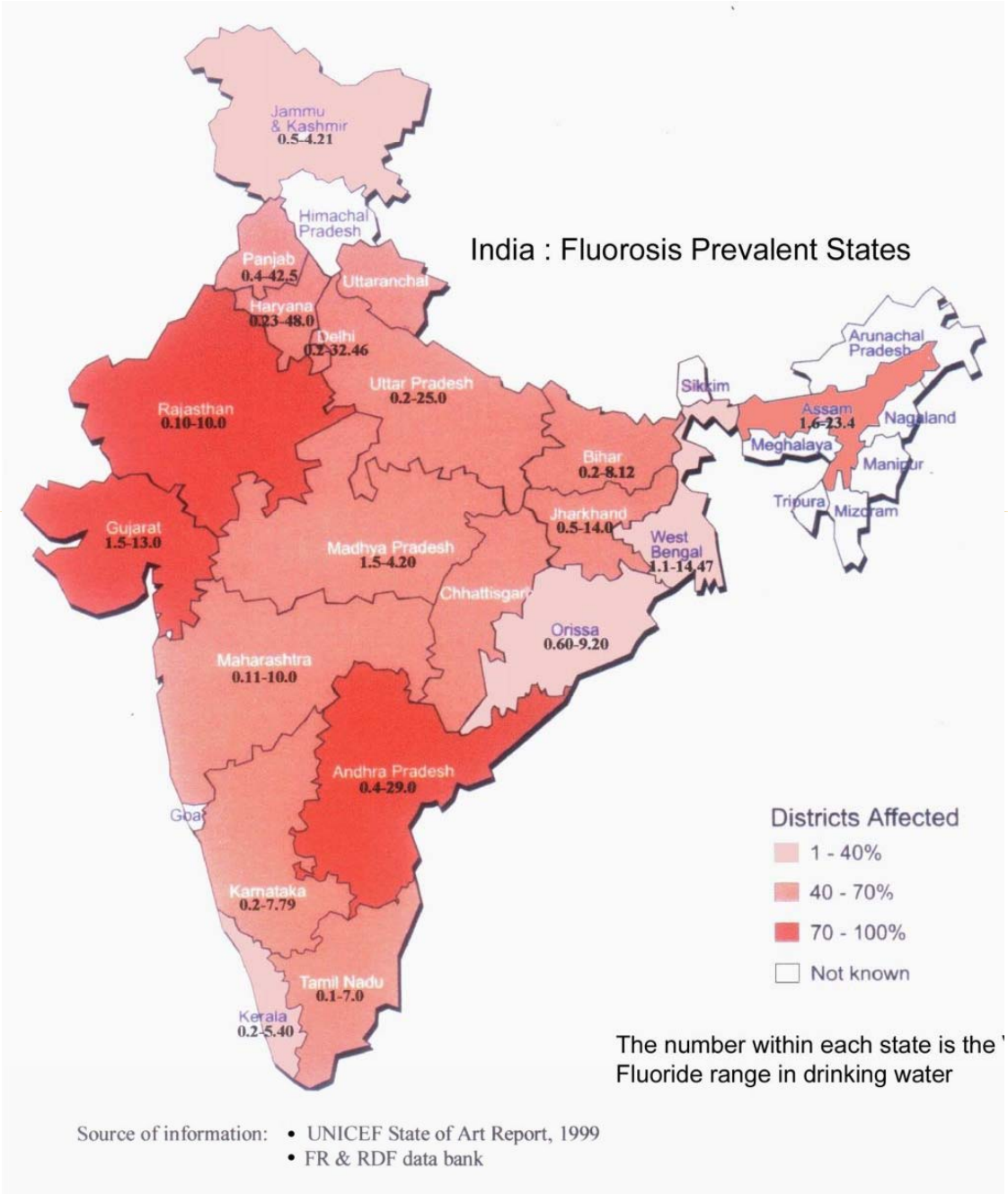


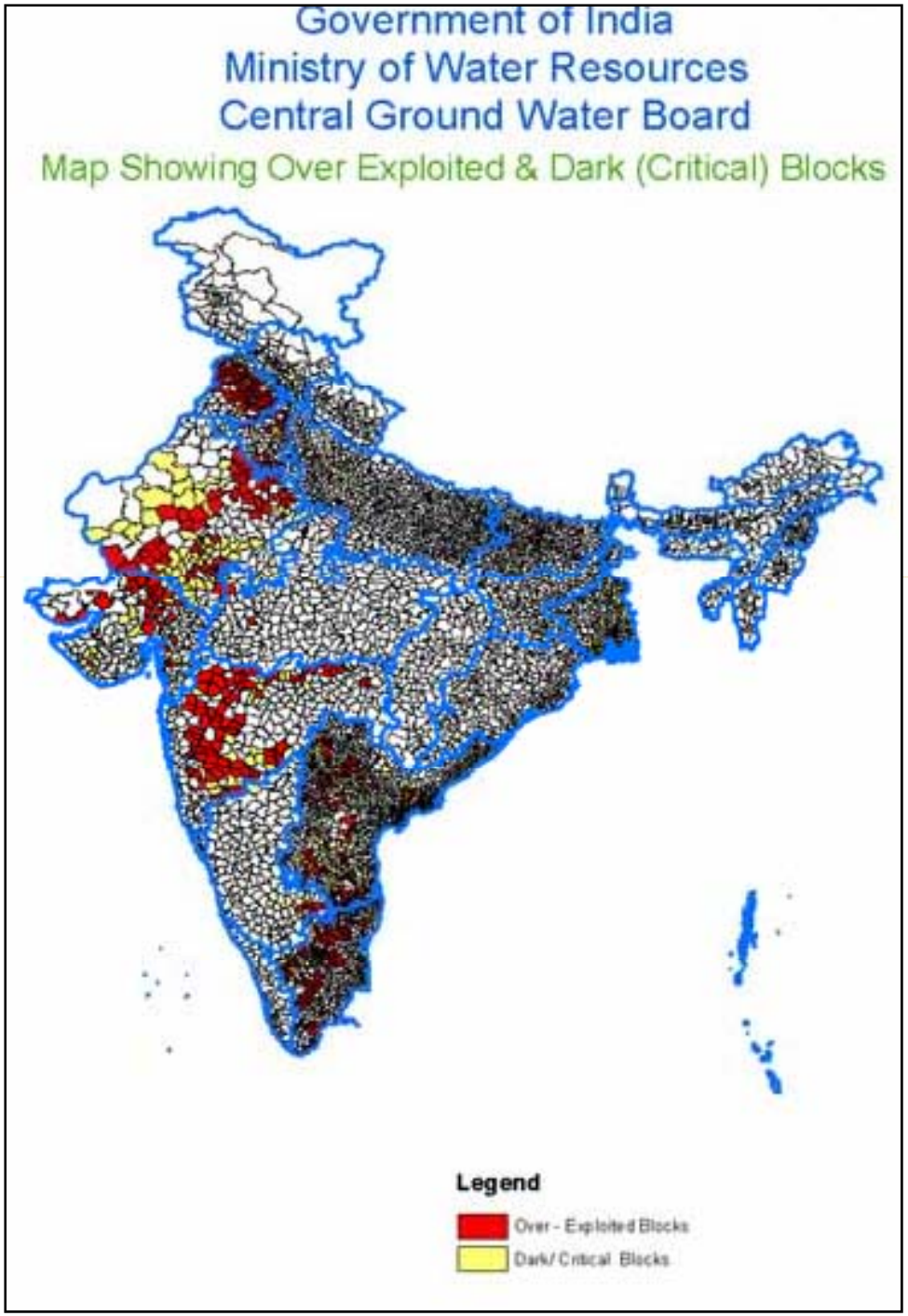
Salinity Affected habs as on 01.04.2011



Nitrate Affected habs as on 01.04.2011

Over-Exploitation leading to Fluoride problems





People at risk= 66 Million

Causes of Ground Water Quality Problems:

1. Contamination due to agricultural, Urban & Industrial wastes.
2. Over-exploitation.
3. Combination of (1) & (2).

Common Ground Water Contaminants:

- Nitrates causing Blue baby disease.

- Pathogens- causing typhoid, cholera,
Bacteria & Viruses dysentery, polio and hepatitis.

- Trace metals like
Arsenic, Lead, Mercury,
Cadmium, Copper, which are toxic and
Chromium & Nickel carcinogenic.

- Organic compounds
Which include petroleum
Derivation, PCBs pesticides.

Natural Contaminants:

- Geogenic pollution: Arsenic & Fluoride Contamination.
- Iron Pollution.
- Inland Salinity.
- Coastal Salinity.

Treatment Technology:

Iron:

Areation.
Chemical Treatment with lime soda.
Cation exchange resin.
Granular Activated Carbon.
Vyordex Method.

Fluoride:

Complexation methods (Nalgonda model).
Ion- Exchange Method (Prasanthi Technique).
Activated Alumina Technology.
Domestic defluoridation.
Community defluoridation Plant (Danida Technique).
Nano-filtration.
Reverse Osmosis.

Treatment Technology: (contd…)

Arsenic:	Oxidation followed by coagulation and filtration.
	Adsorption.
	Ion- Exchange.
	Osmosis.
	Bio-remediation.
Salinity:	Reverse Osmosis.

Present Status of treatment Plants:

- Defluoridation Plants based on Activated Alumina & R. O. are in operation in Rajasthan, Andhra Pradesh, Gujarat, Tamilnadu, Maharashtra.

- A number of Technologies based on Activated Alumina, Granular Ferric Hydroxides, Traditional Oxidation- Coagulation- Flocculation- Filtration and Bio-remediation through creation of Artificial Aquifers are being experimented for Removal of Arsenic.

- For Desalination, Reverse Osmosis based Plants are being used.

Future Prospects:

With the rapid industrialisation, agricultural development stress in ground water quality is increasingly noticed. User-friendly, economically viable and environment-friendly treatment plants both for domestic and community consumption will be the future need for safe water supply.

THANK YOU