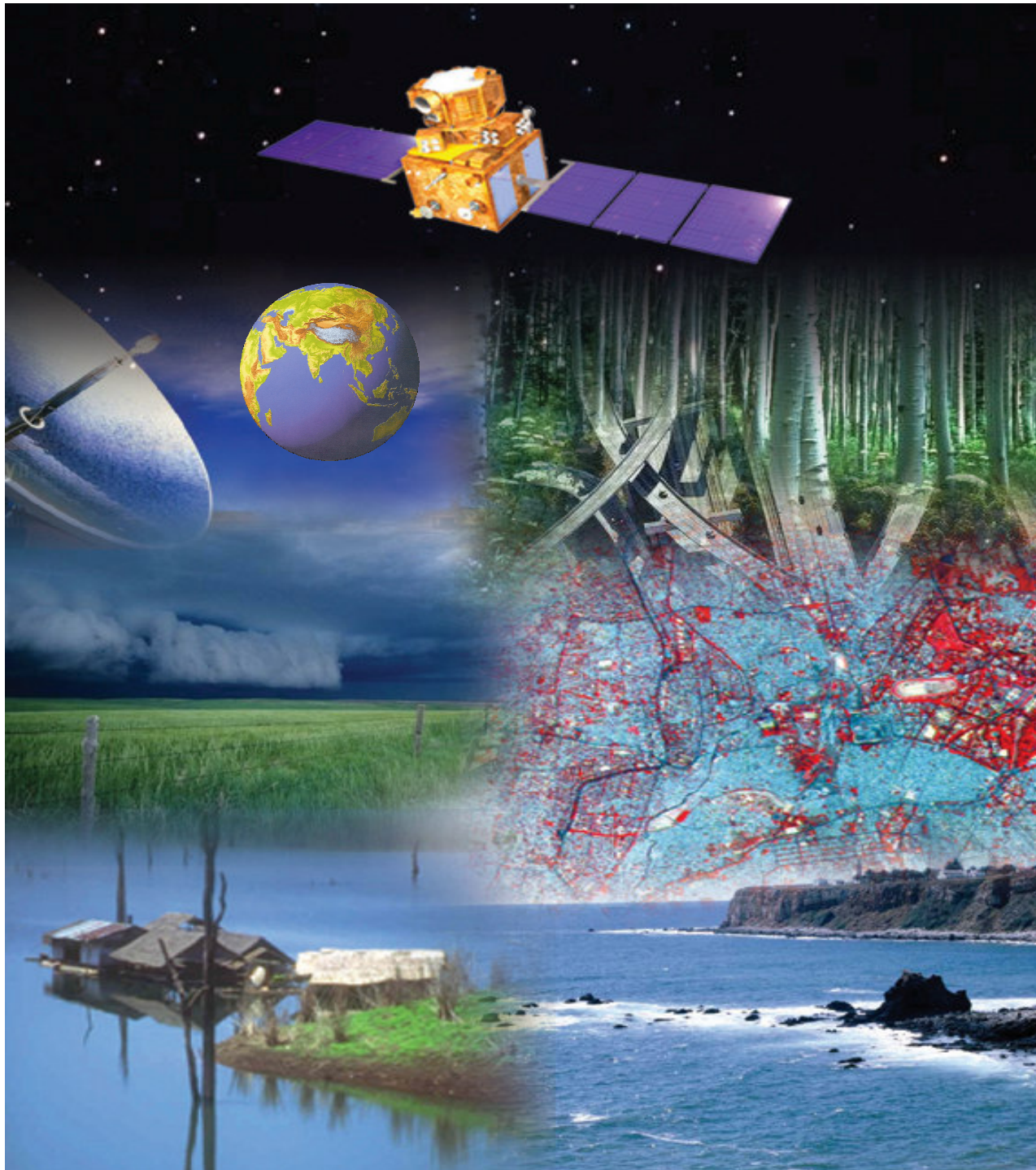




Space-based Information System for management of Water Resources- Indian Perspective

**Dr. K. Radhakrishnan
India**

**Symposium on
Space and Water**

**50th Session of
UN-COPUOS
(June 06-15, 2007)**

.....we must be second to none in the applications of advanced technologies to the real problems of man and society.....

Vikram A. Sarabhai (1919-1971)

A Vision (1963) - shared; sustained; realized; enriched.....

Indian imperatives for Water Resources Management

→ Over-exploitation of Ground Water in several areas

→ Predominantly Rain-fed Agriculture, Low Irrigation Efficiency (~ 35%)

→ 4000 billion cubic metres of rainfall annually; however, only 12% is presently being utilized.

→ Poor predictability of Monsoons

- 2% of World's geographical area
- 4% of World's Water Resources
- 17% of World's population

- Declining per-capita availability of water leading to a water stress condition. (5200 cubic metres in 1951 to nearly 1700 cubic metres now)

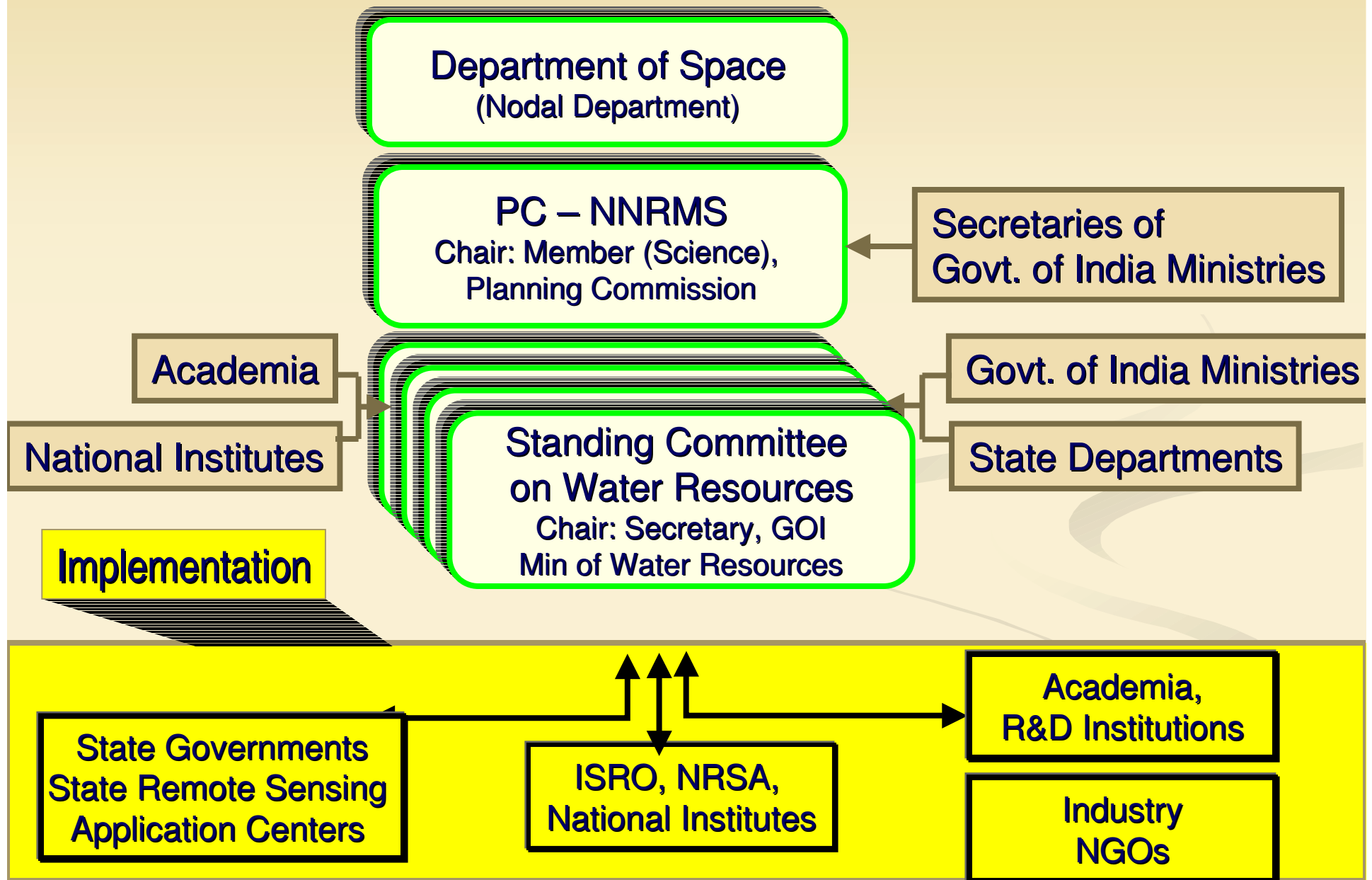
The National Policy Framework

National Water Resources Council headed by Hon. Prime Minister adopted the National Water Policy in September 1987 (and updated in 2002)

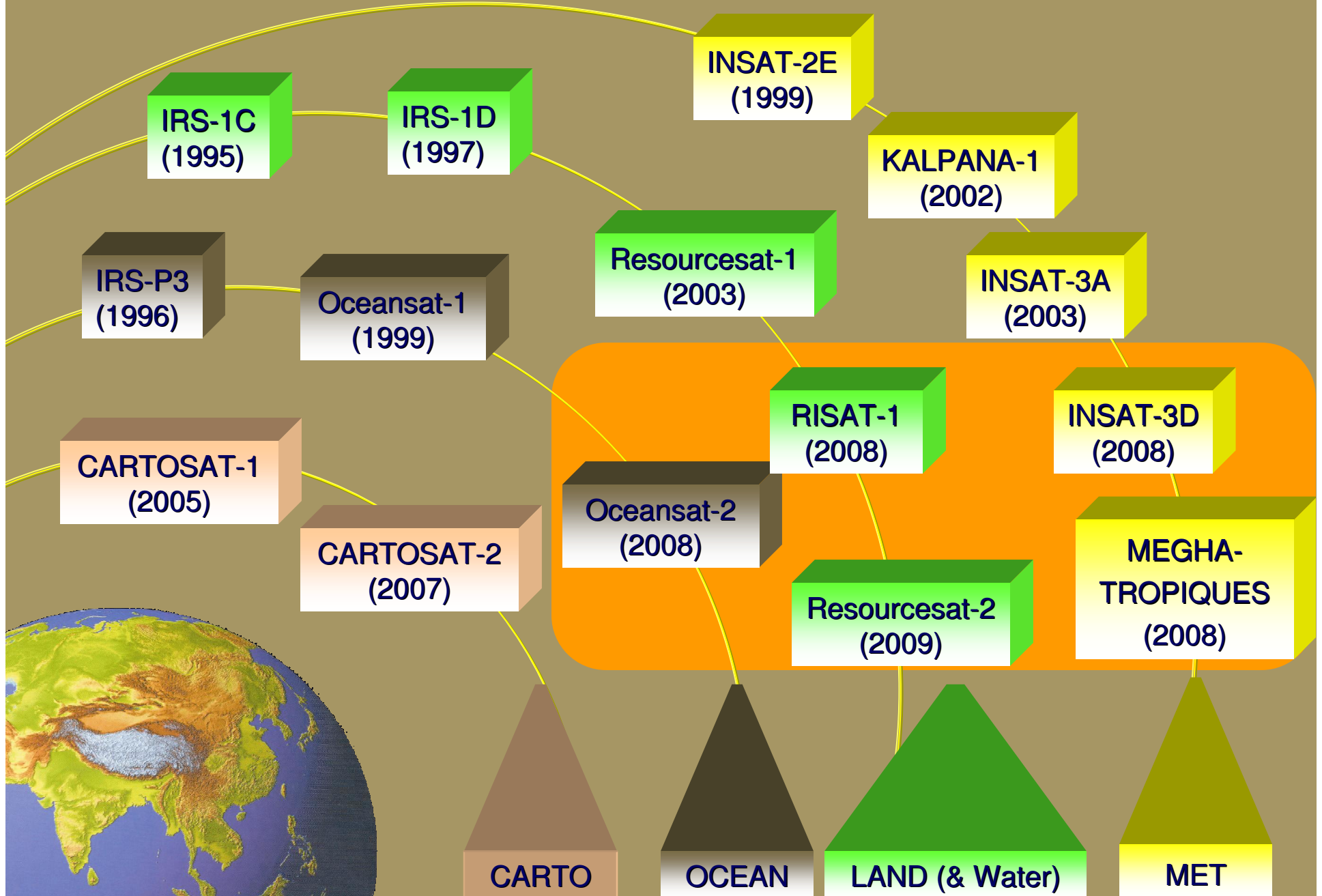
This Policy stipulates that:

- **the prime requisite resource planning shall be a well-developed information system consisting of scientifically designated data bases.....**

National Natural Resources Management System



Earth Observation Satellite Missions from India





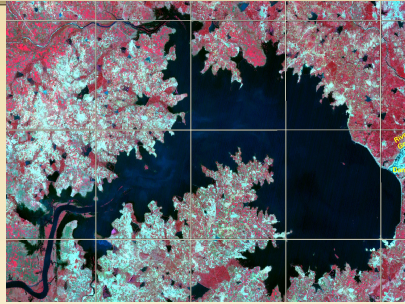
Indian Earth Observation Satellite Constellation

- Spatial Resolution of 1 km to <1 metre
- Polar Sunsynchronous Orbits and GSO (Repetivity of 22 days to every 30 minutes)
- Receiving Global data in India and 20 IRS ground Stations abroad

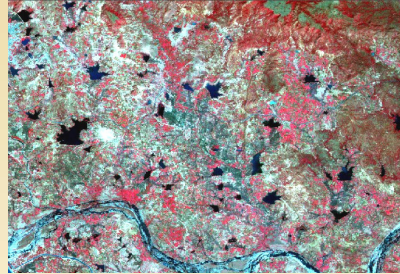
Contributing to national imperative needs

1. Water Security
2. Food Security
3. Environment Security
4. Sustainable Development
5. Disaster Management Support

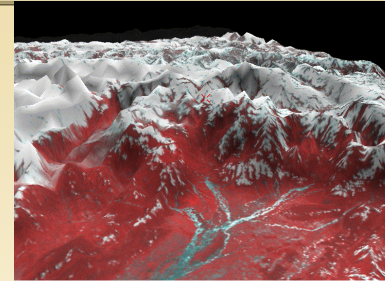
Reservoir Sedimentation



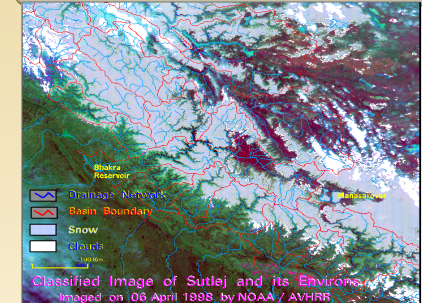
Tank Inventory



Glacier Inventory



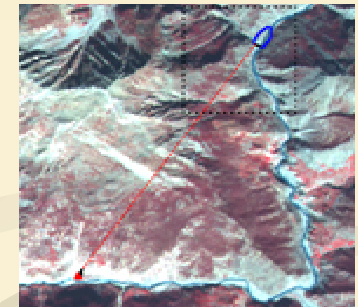
Snow Melt run off



Irrigation Command Area Monitoring



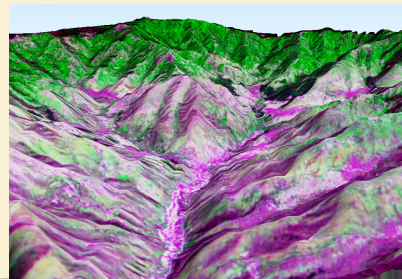
Hydro-Power & River Engg



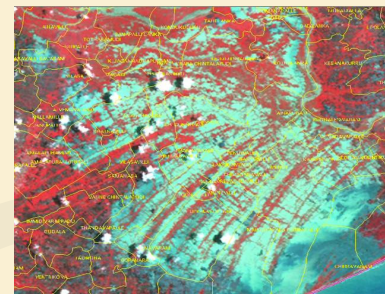
Space-based Remote Sensing
is utilized, country-wide,
on several facets of
Water Resources Management,
(under the aegis of NNRMS)



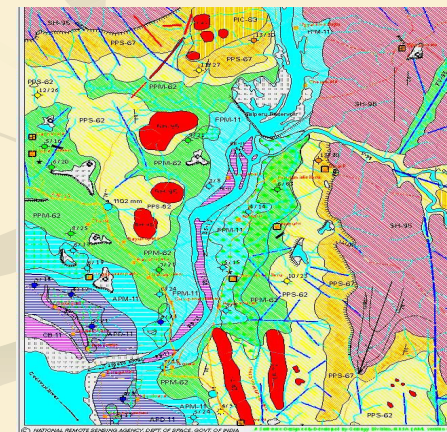
Irrigation Infrastructure



Watersheds



Flood



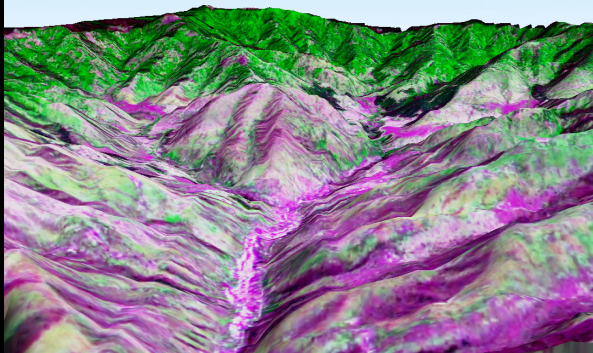
Ground Water

Watershed Management

Watershed as seen on the ground



Watershed as seen from Satellite



1985

1987

1992

2000

2005

2007

Spatial data base for macro-level planning in 16 Districts

Integrated Mission for Sustainable Development in 175 Districts (84 m ha)

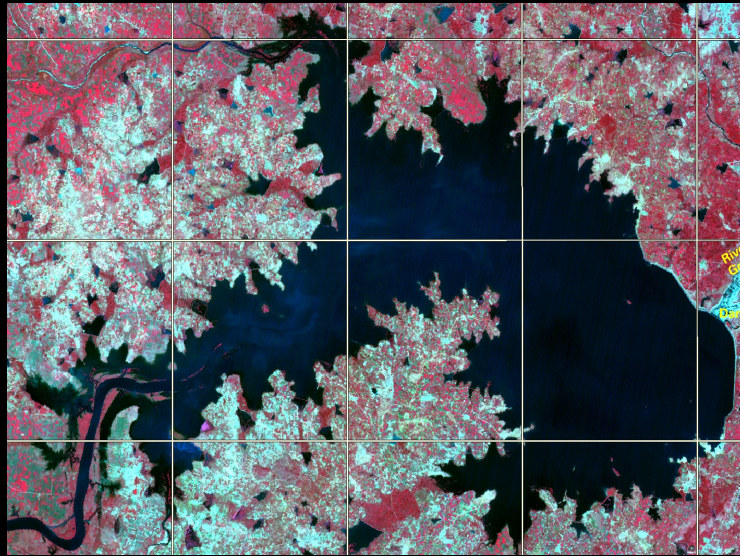
Integrated Resources Information System for Desert Areas (7.6 m ha)

National Agricultural Technology Project

SUJALA- A Watershed Monitoring Project

Support to Integrated Watershed Development;
National Rural Employment Generation Programme

Towards Water Security



1980

Potential
Ground Water Zones

1985

1995

Snow melt Run off;
Glacier Inventory

1995

2006

National Water
Resources
Information System

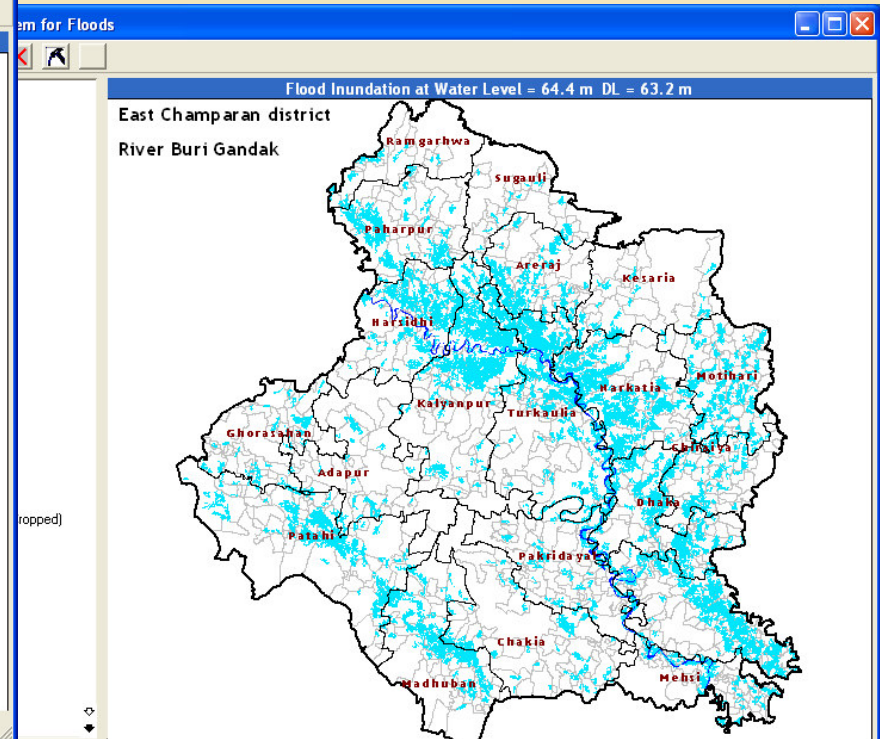
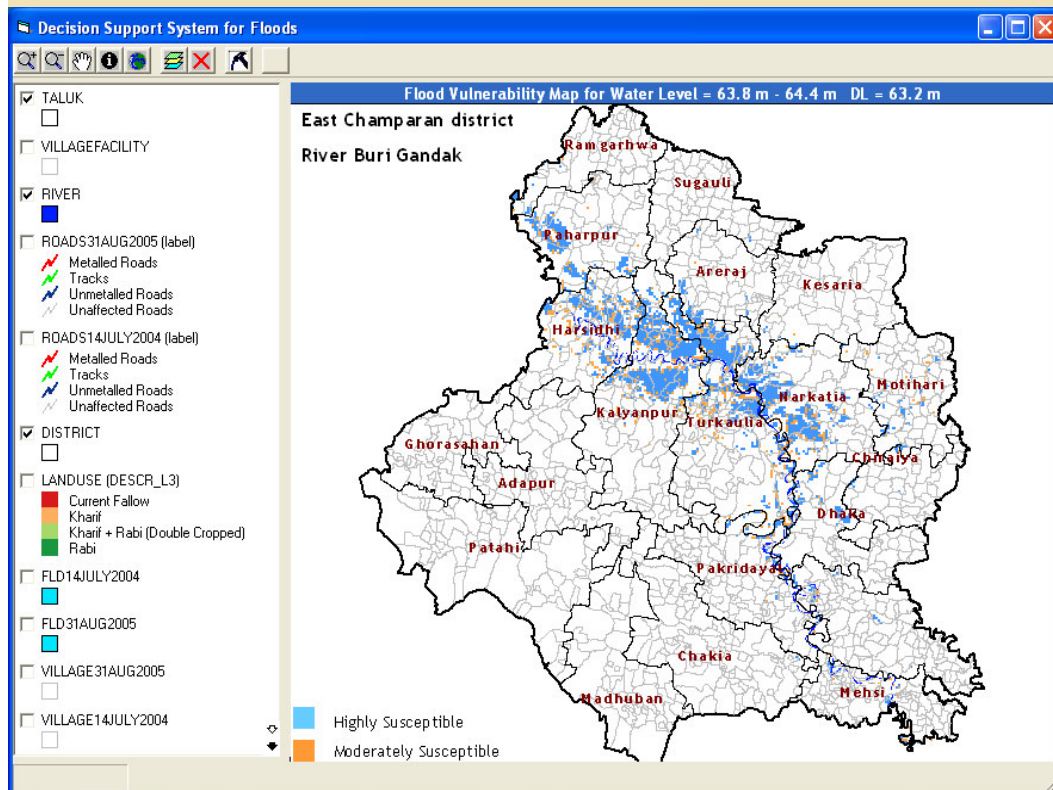
Irrigation Infrastructure
Project Monitoring

Inter-basin Transfer
Feasibility

National Drinking
Water Mission

Command Area Monitoring,
Reservoir Sedimentation

Decision Support Systems-Flood inundation



Village-wise Information

Click on the column header to sort the column

☐ Show District information

	LCODE	LOCATION	Tot_area	Aff_area	Tot_pop	Aff_pop	Tot_cattle
▶	130010001000100036	Palanwan	66874800	759511	32636	371	24476
	130010001000100026	Saunaha	2579020	287769	1522	170	1142
	130010001000100021	Kananaparshotimpur	4098280	188764	3459	159	2594
	130010001000100016	Lachhmipur	1716160	52425	1854	57	1390
	130010001000100039	Belwa	2219710	646745	1517	442	1138
	130010001000100020	Sihorwa	1208890	26674.7	977	22	733
	130010001000100027	Harnahi	8629020	297802.4	7622	263	5716

WATER RESOURCES INFORMATION

- Local
- Regional
- National

AVAILABILITY

- Geographic Distribution
- Temporal Dimension
- Quality
- Quantity

- Village Tank
- Lake / Reservoir
- Stream flow
- Ground Water
- Snow & Glaciers

- ISRO/NRSA
- State Remote Sensing Application Centres
- Min. of Water Resources

UTILISATION

- Sectoral water demand
- Land information
- Optimum Utilisation

- Rain fed / Irrigated Crop land
- Rural / Urban Areas
- Watershed / river Valley

- Min. of Water Resources
- Min. of Agriculture
- Respective Departments of the State Governments

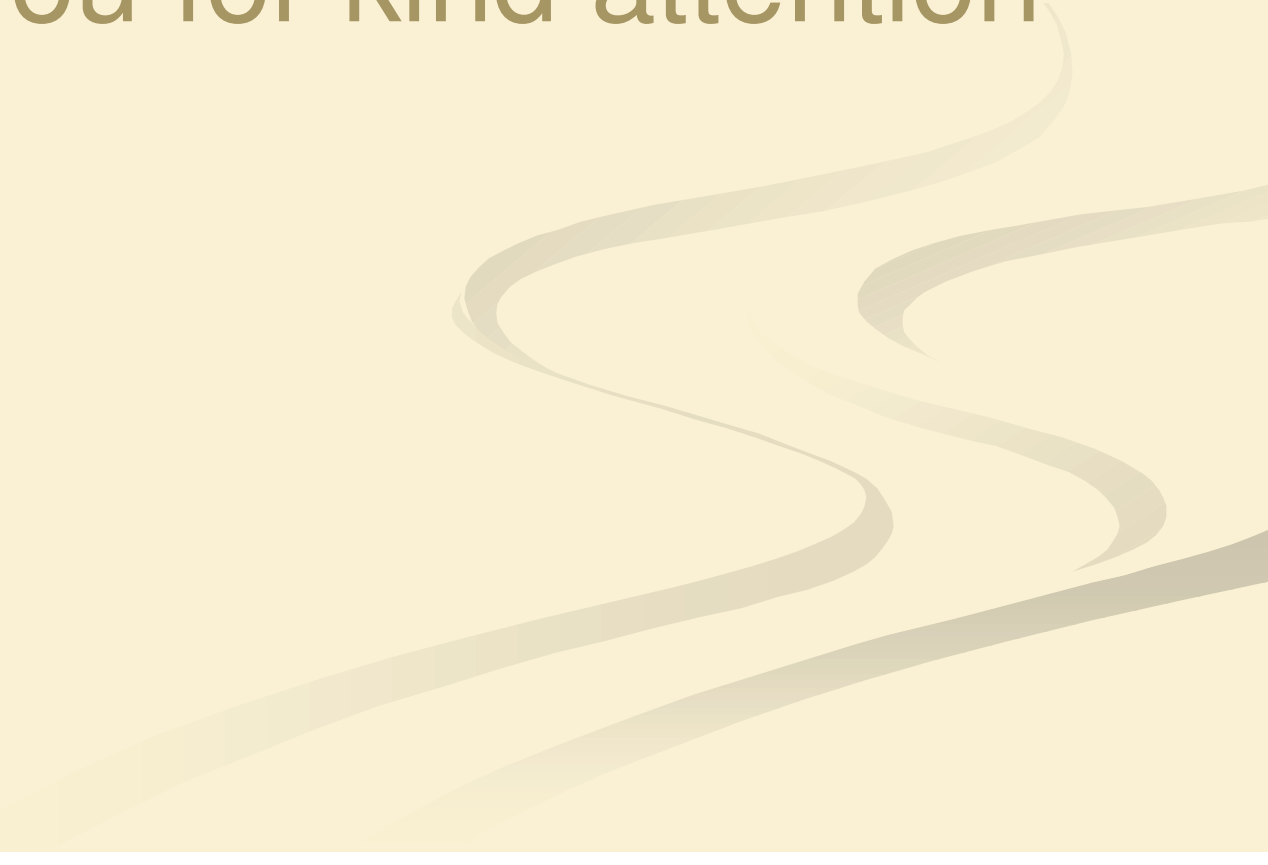
MANAGEMENT

- Land Management
- Water Management
- Monitoring *

- Irrigation management
- River basin planning
- Reservoir Sedimentation
- Flood Control
- Drought Mitigation
- Water use efficiency
- GW management

- Min. of Water Resources
- Min. of Agriculture
- Respective Departments of the State Governments
- ISRO/NRSA

Thank you for kind attention

The background of the slide is a solid light beige color. In the lower right quadrant, there are several overlapping, wavy, horizontal lines in a slightly darker shade of beige, creating a subtle decorative pattern.