

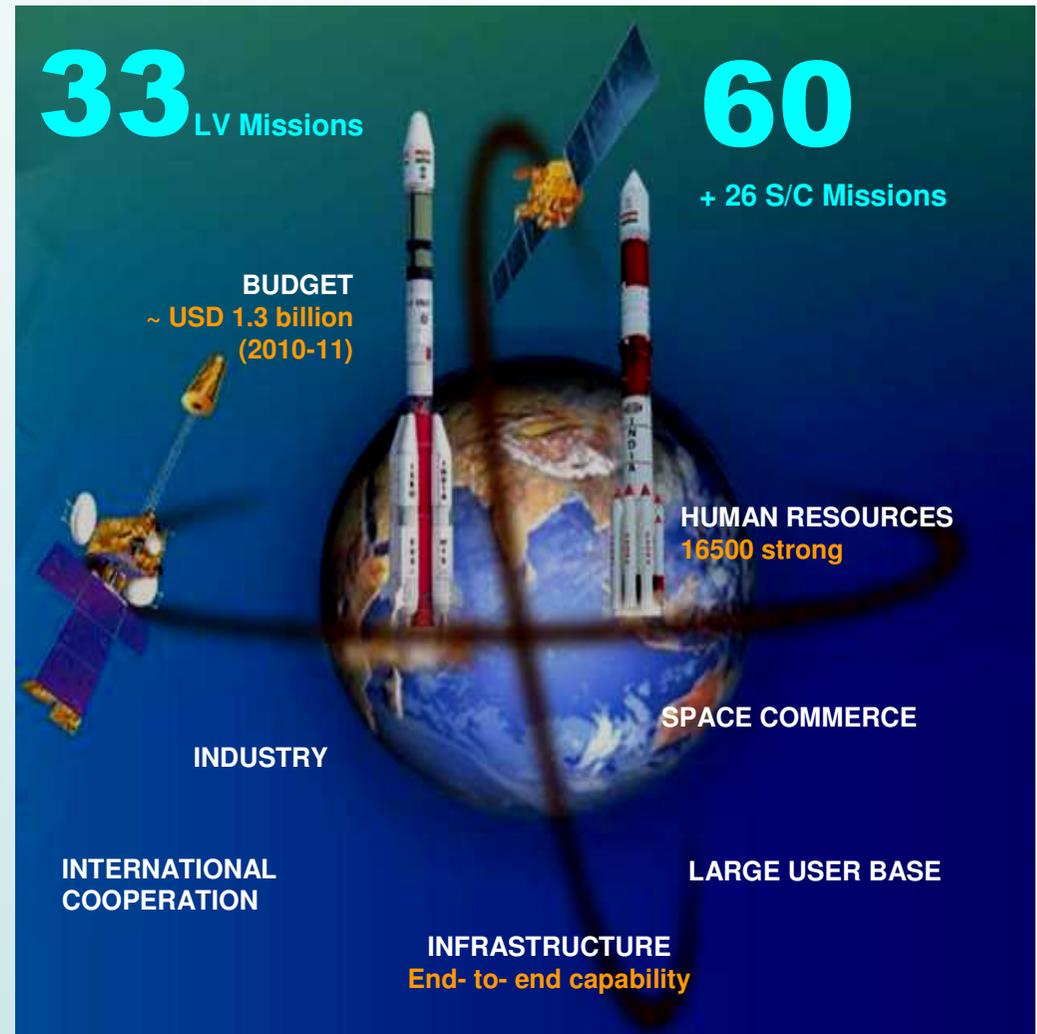


# Contents

- **Space programme in India**
- **Current constellation of EO satellites**
- **Space for Irrigation water management**
- **A few Applications**
  - **Irrigation Potential Assessment**
  - **Command area development**
  - **Salinity and waterlogging assessment**
  - **Reservoir sedimentation assessment**
  - **Watershed Development**
  - **Accelerated Irrigation Benefit Programme**
  - **Snow-melt run-off assessment**
  - **Agricultural drought assessment**
  - **Water Resources Information System**
  - **High resolution imaging application**

# Space Programme in India

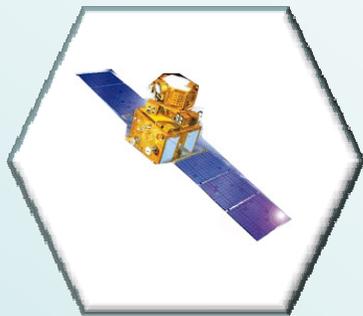
- Self reliance in space transportation, spacecraft operations
- Successful demonstration of space technology Applications
- Strong Institutional Mechanism to sustain the activities
- Steadfast International relations



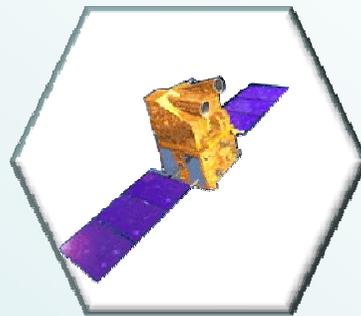
# Earth Observation Assets of India



22.10.2001  
**TES**  
Step& Stare PAN



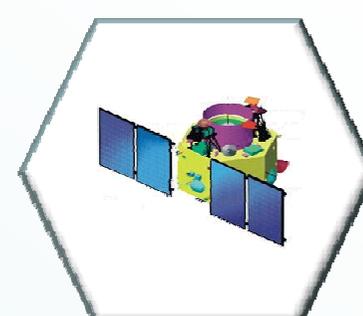
17.10.2003  
**RESOURCESAT-1**  
LISS 3 & 4; AWiFS



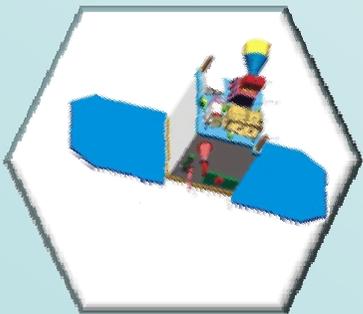
05.05.2005  
**CARTOSAT-1**  
PAN, F/A



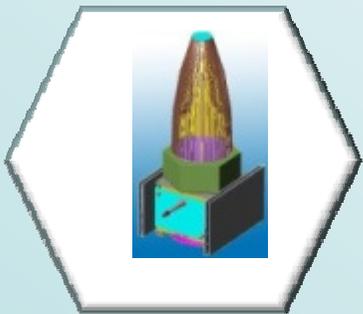
10.01.2007  
**CARTOSAT-2**  
PAN



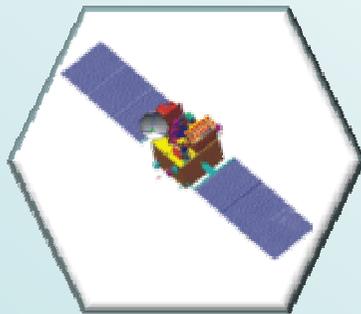
28.04.2008  
**CARTOSAT- 2A**  
PAN



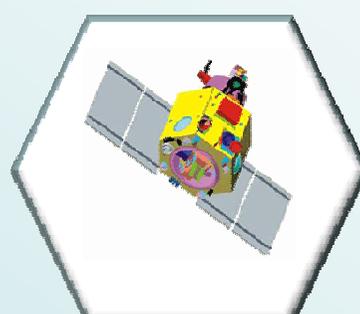
28.04.2008  
**IMS-1**  
HySI; Mx



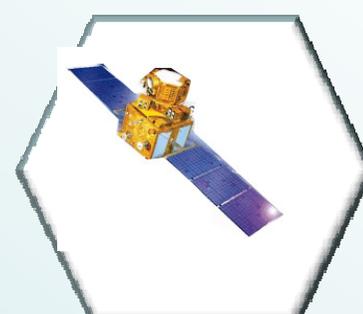
20.04.2009  
**RISAT-2**  
X-band SAR



23.09.2009  
**OCEANSAT-2**  
OCM, SCAT; ROSA



12.07.2010  
**CARTOSAT- 2B**  
PAN



20.04.2011  
**RESOURCESAT-2**  
LISS 3 & 4; AWiFS

**Aerial**



**Digital Camera  
Laser Terrain Mapper**

# Space based inputs for Irrigation Water Management

## Need

- To improve the overall project efficiency
- To reduce the gap between potential, created & utilised
- To maximise the production
- To prevent land degradation



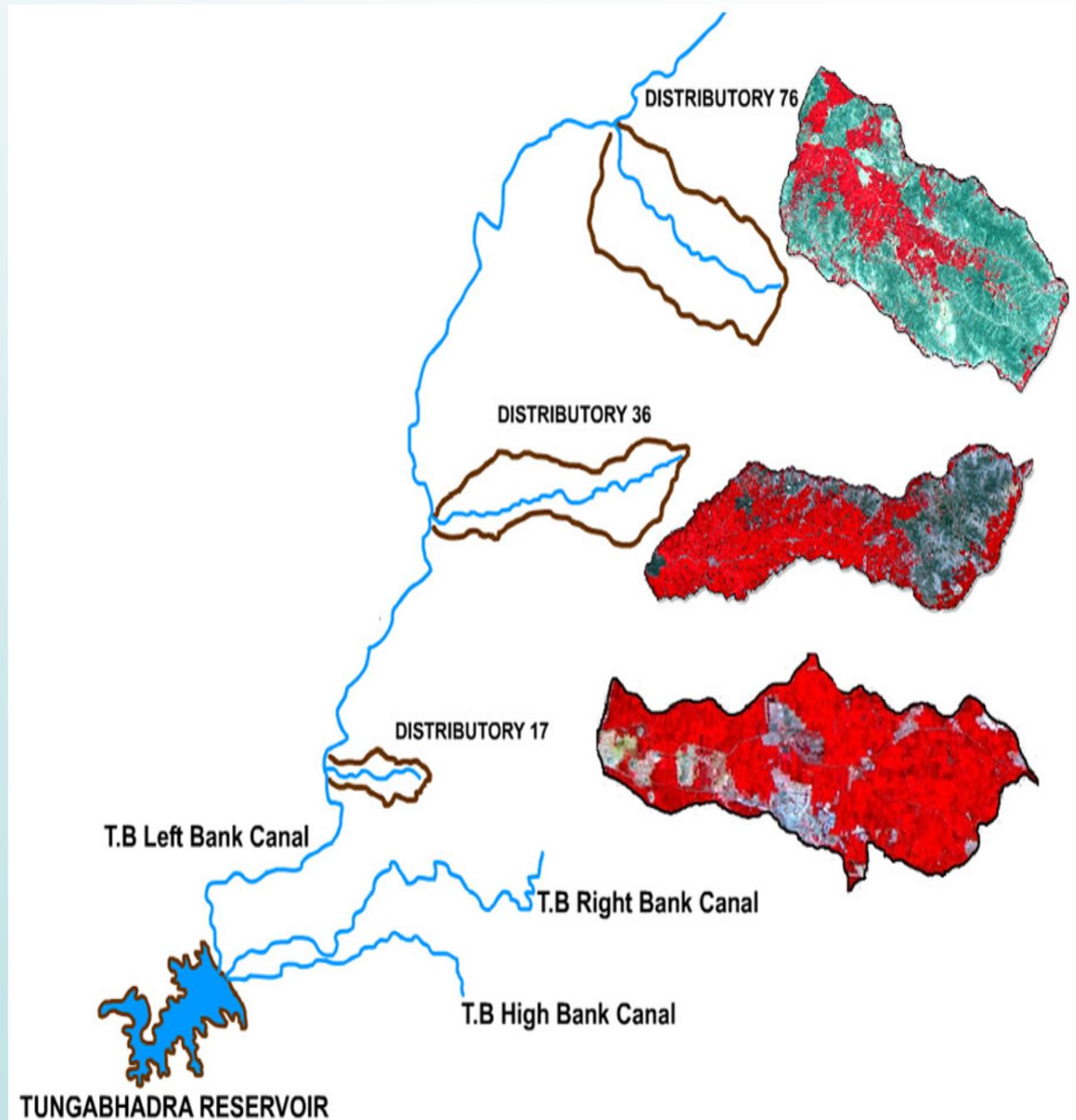
## Space technology helps in

- Base line information for planning of new irrigation / water resources projects
- Modernisation and rehabilitation of irrigation schemes
- Performance evaluation of irrigation command Areas

# Command Area Surveys: Irrigation Planning

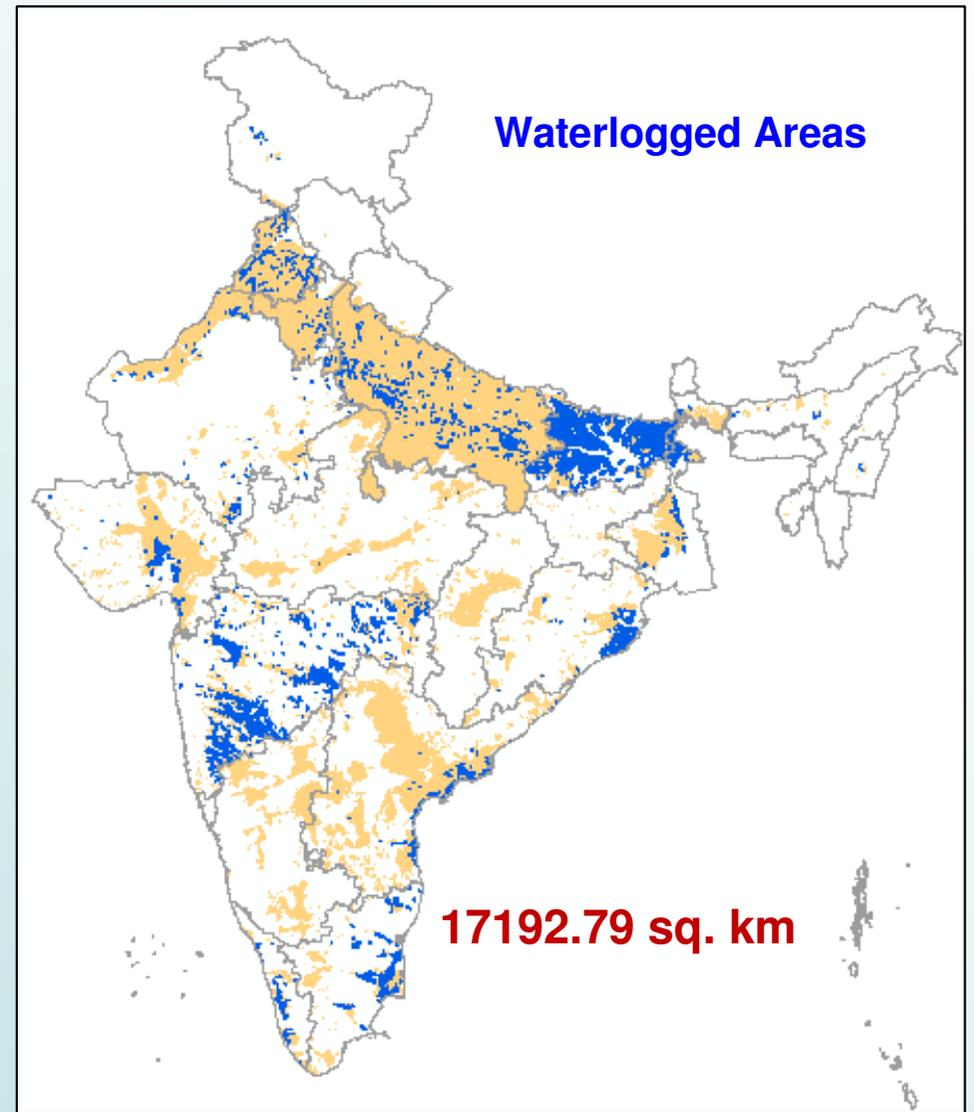
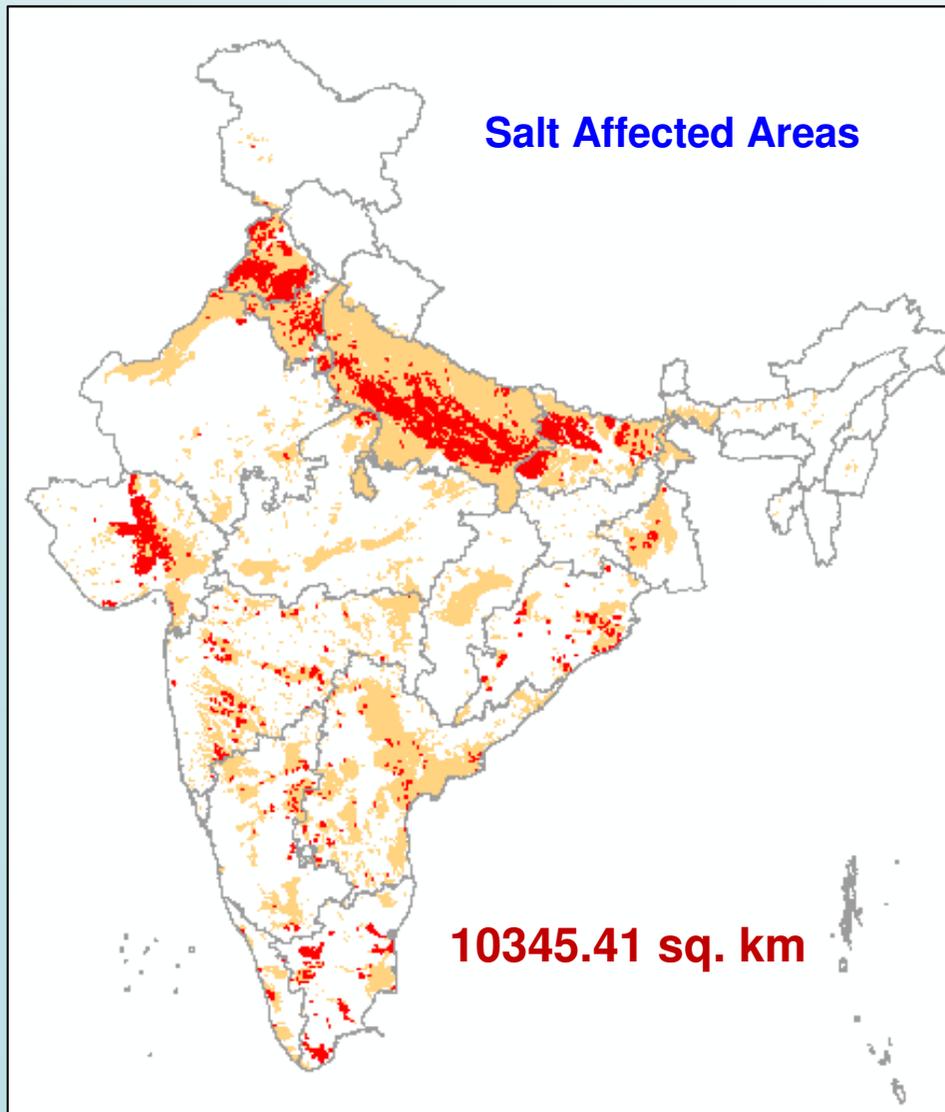
**Thematic maps on land use / land cover and soils for land irrigability assessment & their integration for :**

- **Alignment of distributaries- design of canal network**
- **Identification of irrigable areas under each of the proposed distributaries**
- **Designing suitable cropping pattern**
- **Fixing design discharges at head of the distributaries**



# Assessing Salinity & Water logging

## Under Major and Medium Irrigation Commands



1701 irrigation commands (429 major and 1272 medium)

# Reservoir Siltation

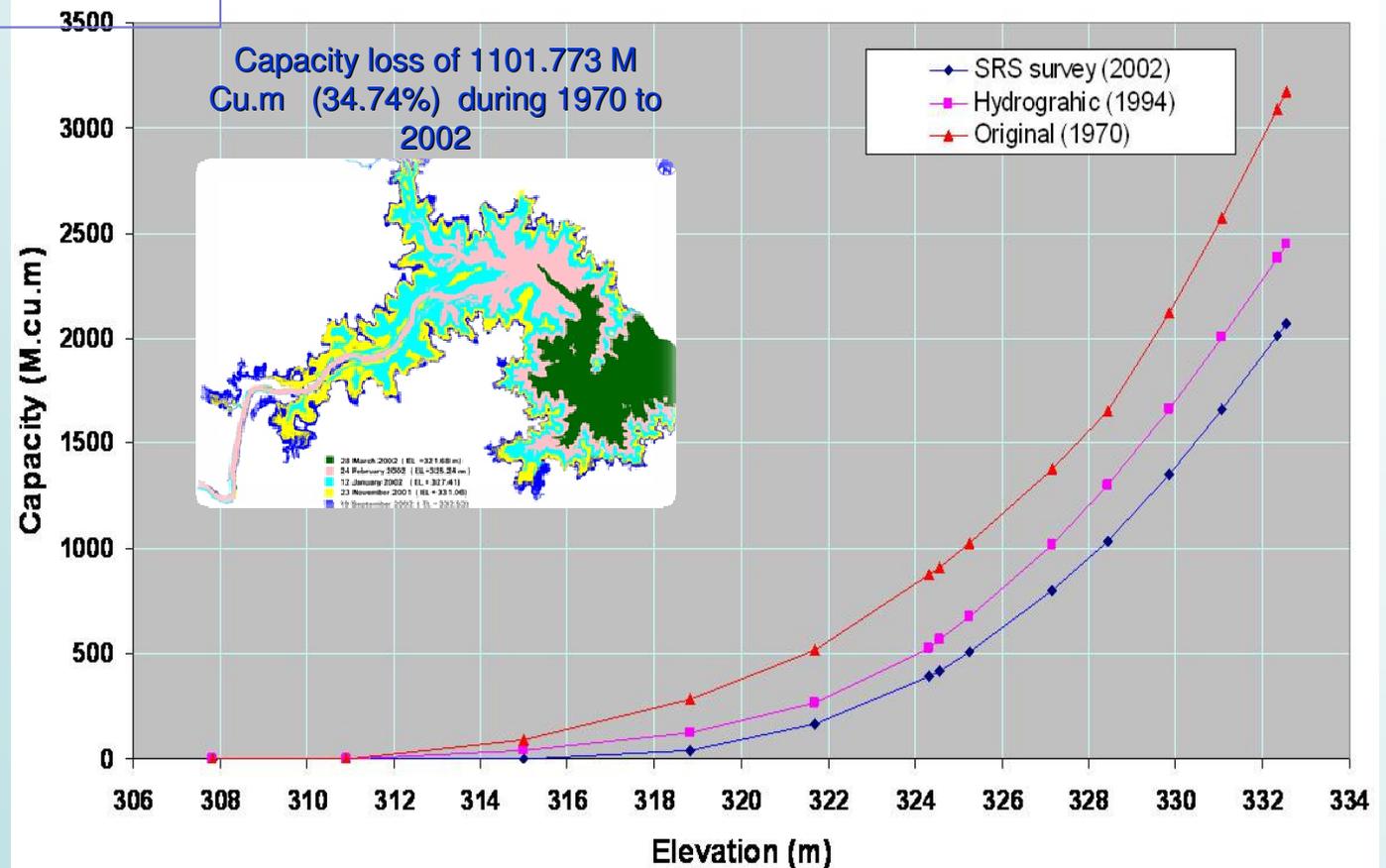
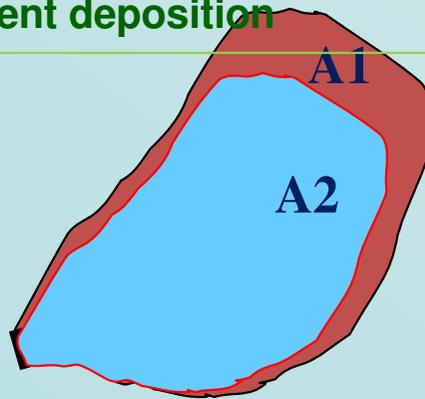
## Assessment of Available Storage

### Advantages

- Rapid silting and loss of storage results in reduction of economic life of reservoir
- Annual siltation rate of Indian reservoirs is ~2 times the designed rate
- RS Technique complements the conventional Hydrographic survey - cost & time effective.

- Satellite data provide elevation contour areas directly in the form of water spread areas

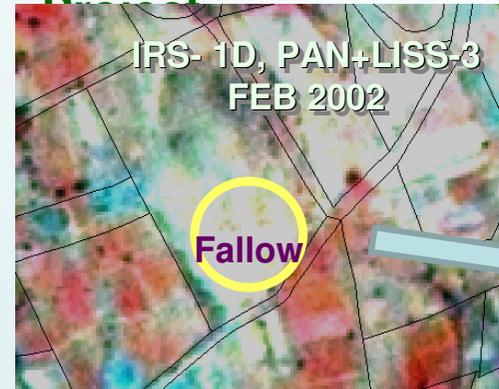
- Reduction in reservoir Water spread at a specified elevation over a period of time is indicative of sediment deposition



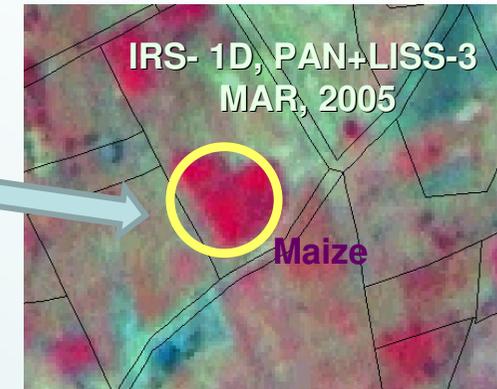
# Participatory Land and Water Resources Management

## Monitoring & Evaluation of developmental activity in 77 sub-watersheds in 5 districts of Karnataka – Sujala Project

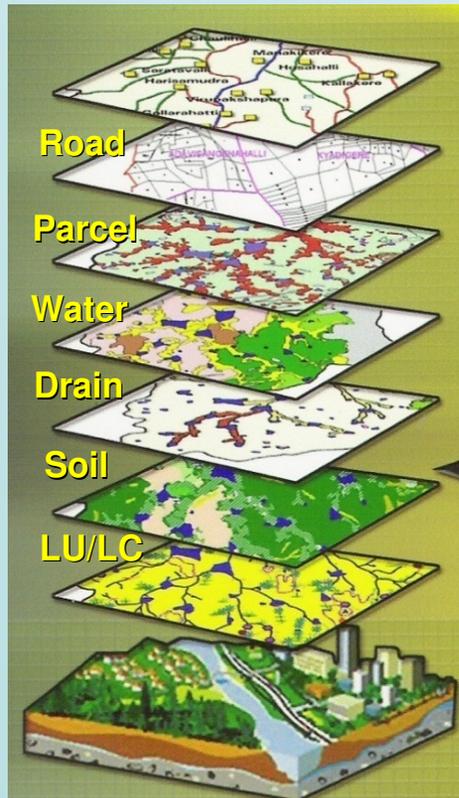
- Watershed prioritization & Development using EO inputs
- Concurrent Monitoring & Mid-course correction of Implementation
- Social & Environmental Impact Assessment
- Improving the quality of life
- Conferred Globe Sustainability Research Award 2010 by the Globe Forum



### Monitoring Land use Changes



Increase in Cropping Intensity



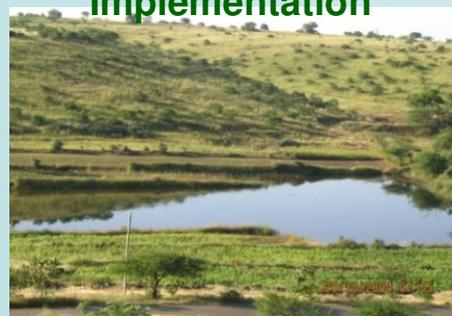
Participatory Implementation



Watershed Community



Nala bund



Farm Pond



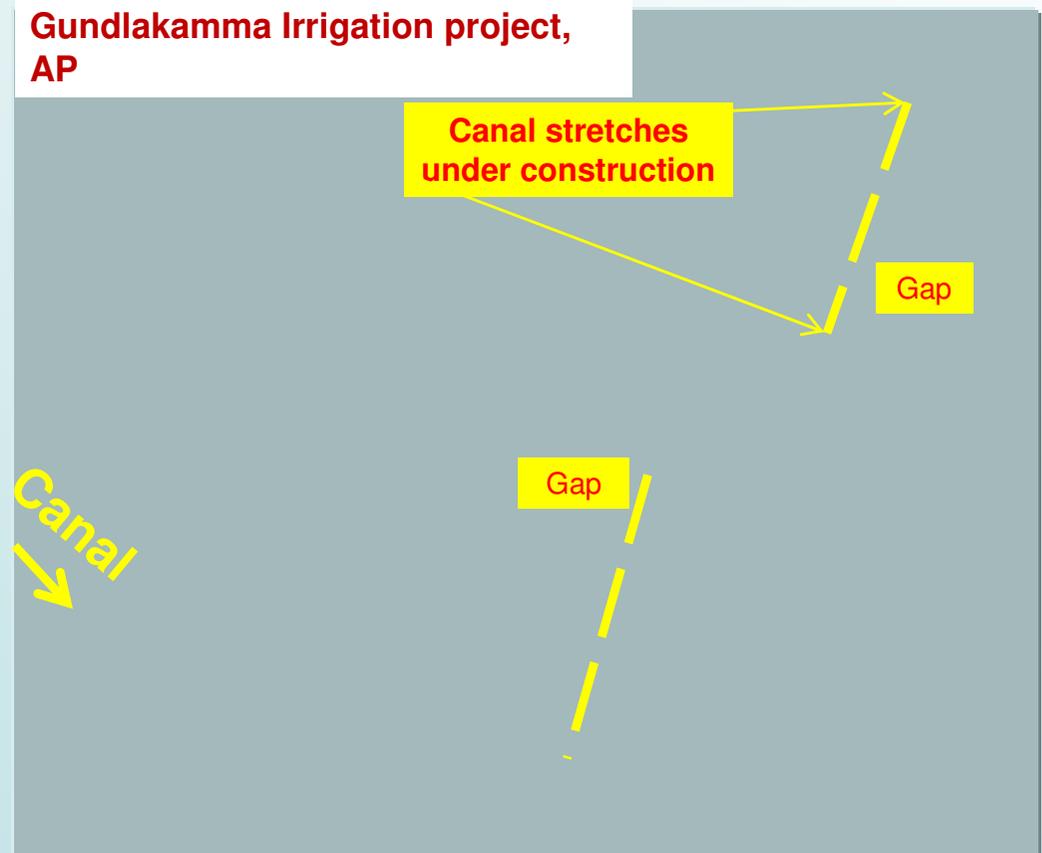
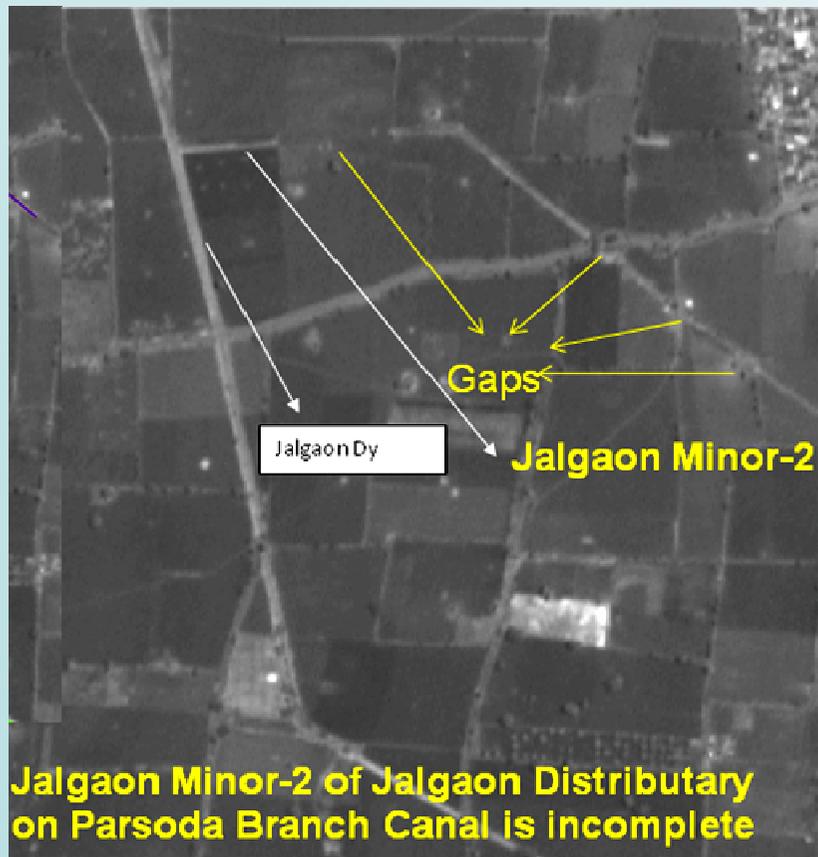
Outcome

# Assessment of Irrigation Potential Created

## Accelerated Irrigation Benefit Program (AIBP)

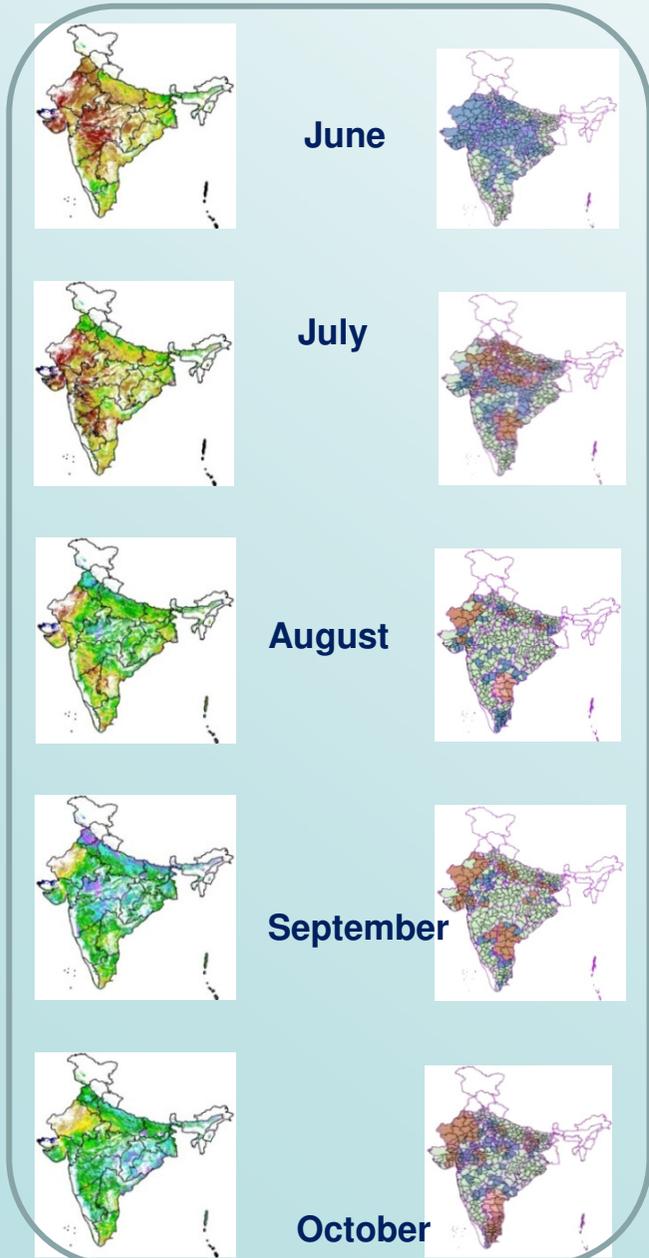
- Identification of all the canals up to minor level & irrigation & cross drainage structures
- Measurement of lengths and off take chainages
- Capturing the Status of each canal
- Irrigation Potential Creation assessment

## Cartosat-1 images showing the Incomplete canal & Pending canals





# National Agricultural Drought Assessment & Monitoring System

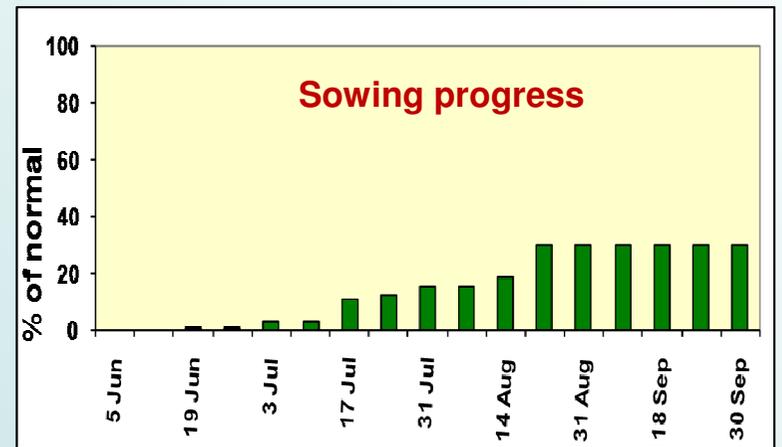
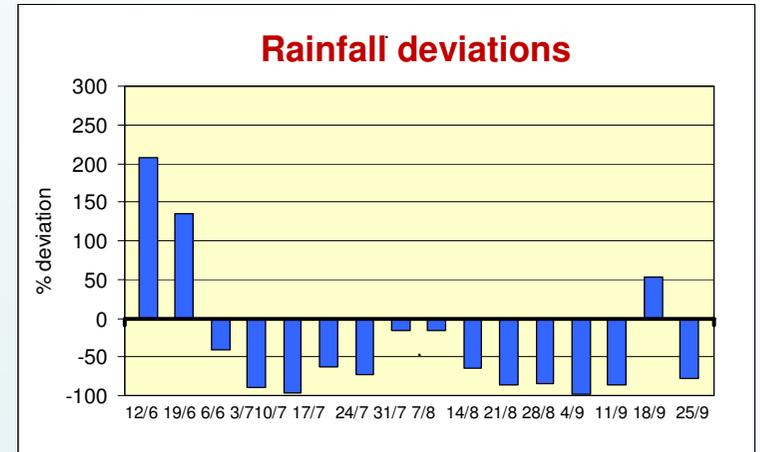
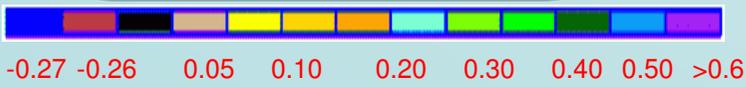


**No. of districts under drought in 2010**

<b>June</b>	<b>10 dist</b>
<b>July</b>	<b>52 dist</b>
<b>Aug</b>	<b>141 dist</b>
<b>Sep</b>	<b>109 dist</b>
<b>Oct</b>	<b>104 dist</b>



**District/ Sub-District Level Drought Monitoring**



**Integration with ground data**

# India Water Resource Information System



Home

Metadata Site Map Events Publications Downloads Links

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Help



India - WRIS Explorer

India-WRIS a 'Single Window solution' for all water resources data and information in a standardized national GIS framework.



It consists of 12 Major Information systems, 30 sub-information systems, 101 layers with +4000 attributes

1

2D & 3D

Geo-Visualization & Processed data

2

Information Systems & Temporal Analyst

3

User Services

- ❖ Real time data
- ❖ Create your own Project
- ❖ View & Share success stories
- ❖ Modeling framework\*
- ❖ Processed grid data\*

4

Data Input /collection system

Hydrologic Unit, Political Unit, Area selection

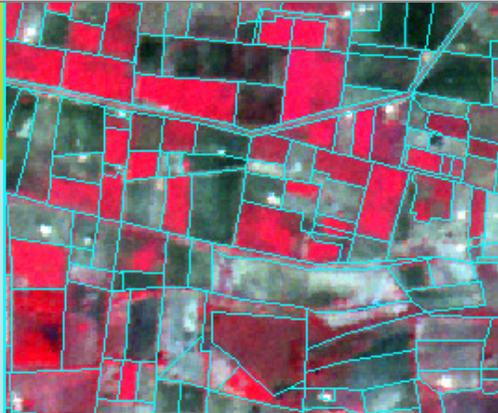
# Irrigation - High Resolution Data Applications

Upgrading

Recouping unutilized  
(National Project for Repair,  
Renovation and Restoration of  
tanks)

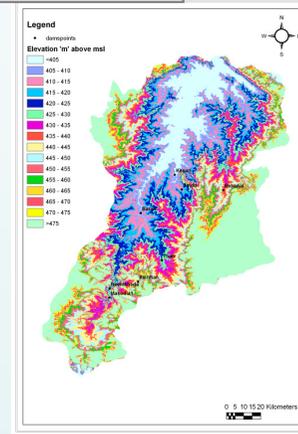
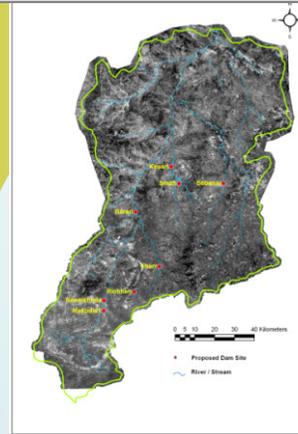


Enhancing utilisation: Water  
Use Efficiency (Command Area  
Development & Water  
Management)



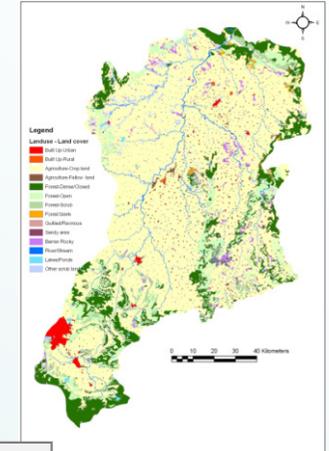
Expanding

Assisting New  
Creation  
- Inter Linking of Rivers  
(ILR)



Elevation

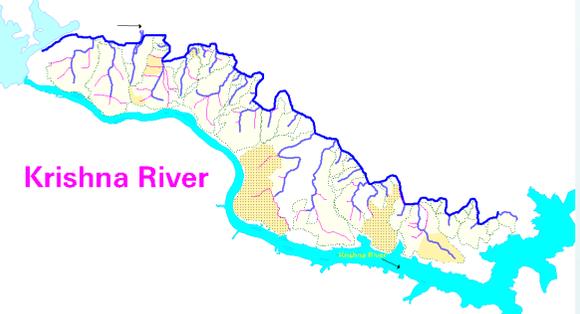
Land use



Pacing up the Creation  
(Accelerated Irrigation Benefit  
Programme)



Almatti Left Bank Canal (ALBC)



Assessment

**Thank you for your Kind Attention**

