Forum on Natural Capital Accounting

November 11, 2019

Ministry of Statistics and Programme Implementation (MoSPI)

Government of India

Starting Point

- **Interaction with different agencies on activities to be taken up under the project**

- **Stock-taking landscape assessment of**
  - **existing ecosystem accounting initiatives and literature in India**
  - **data sources for compiling ecosystem accounts**
  - **institutions and agencies active in this field**
  - **states where a detailed study for compilation of ecosystem accounts could be launched**

  https://seea.un.org/sites/seea.un.org/files/india_assessment_2019.pdf

EnviStats India 2018
Supplement on Environmental Accounts

- Asset Accounts - Combination of environment and ecosystem accounts

- Land account – land cover: stock and change

- Mineral account – proved and probable reserves, remaining resources

- Water account – availability in river basins and groundwater

- Forest accounts – forest cover, growing stock of timber and carbon

- (link: http://mospi.nic.in/publication/envistats-india-2018-supplement-environmental-accounts-0)
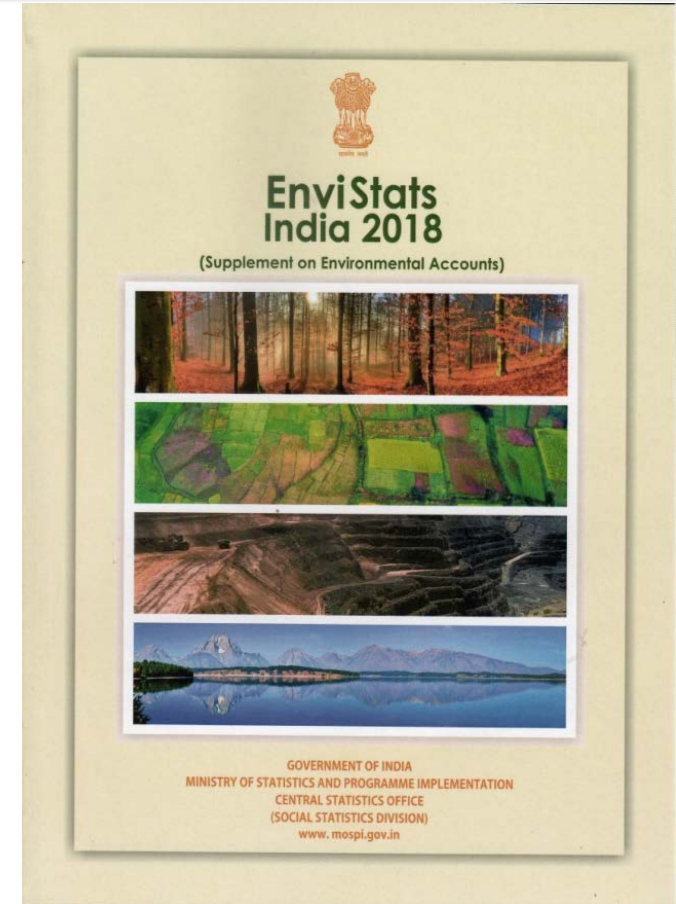
Highlights of the Asset Accounts

- **Changes in Assets**
  - **Change from fallow to farmland, increases in forest cover, carbon stock, proven reserves and resources of minerals**
  - **Decline in Growing stock in some States and groundwater resources**
- **Effect of climate change**
  - **Fluctuations in land under 'snow and glacier' and 'wetlands/water bodies'**
- **Urbanization**
 - **Increase in built-up area - in some cases, at the cost of farmland**

EnviStats India 2019
Volume II : Environment Accounts

- **Soil Nutrition Indices, for the various macro and micro-nutrients**

- **Water Quality Accounts of river water in select River Basins**

- **Water Quality Accounts of groundwater in some States of India**

- **Water Quality Indices of seawater across certain coastal monitoring sites**

- **District-wise values of the ecosystem service provided by land in the 'provisioning of crops'**

- **State-wise values of nature based tourism services**

(link: http://mospi.nic.in/publication/envistats-india-2019-volii-environment-accounts**)**
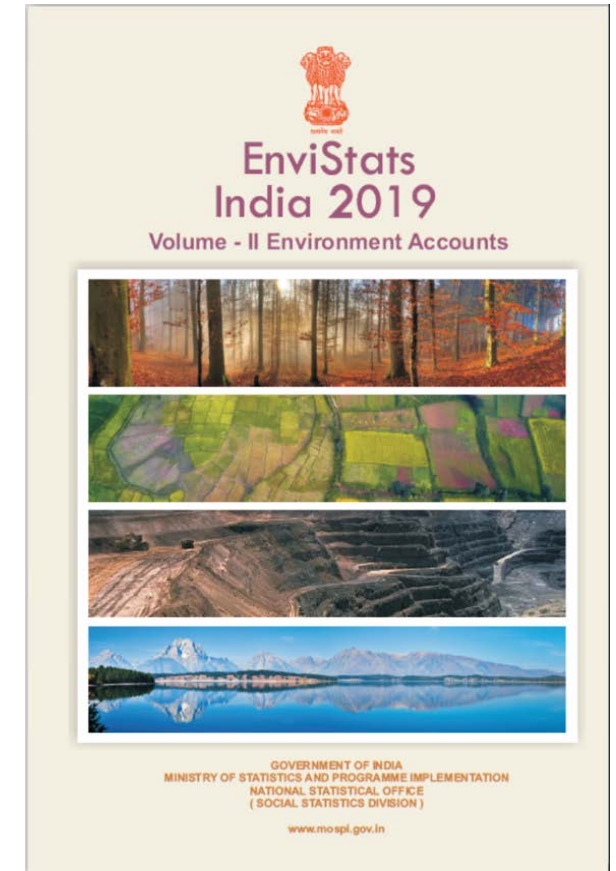
Soil Nutrient Indices

Soil Nutrient Index

- Nutrient index introduced by Parker et al.(1951)

  Nutrient Index (N.I.) = $(N_L \times 1 + N_M \times 2 + N_H \times 3) / N_T$

    L- Low, M – Medium, H – High, T – Total

- Data reported for Cycle I (2015 to 2017) and Cycle II (2017-2019) of the Soil Health Card Scheme analysed for compiling the Soil Nutrient Index.
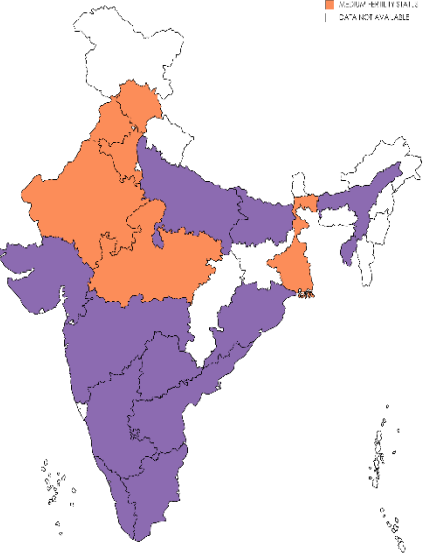
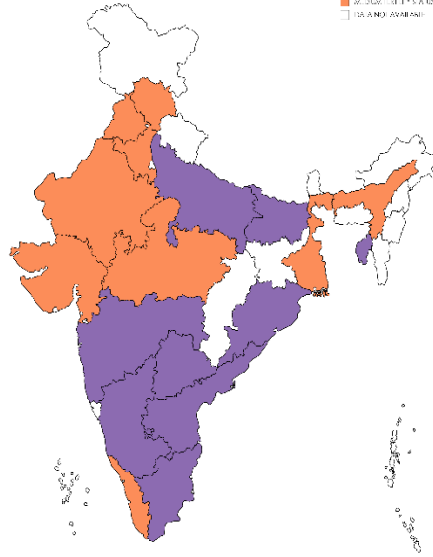| Rating Chart of Nutrient Index			
S.No.	Nutrient Index	Value	Interpretation
1	High	>2.33	High fertility Status of the area
2	Low	<1.67	Low fertility Status of the area
3	Medium	1.67-2.33	Medium fertility Status of the area

Phosphorous Fertility Status

Rating Chart of Nutrient Index			
Legend	**Nutrient Index**	**Value**	**Interpretation**
	Low	<1.67	Low fertility status of the area
	Medium	1.67-2.33	Medium fertility status of the area
	High	>2.33	High fertility status of the area
	Data not available		

Water Quality Accounts

Quality Account for India

- Designated Best Use Classification

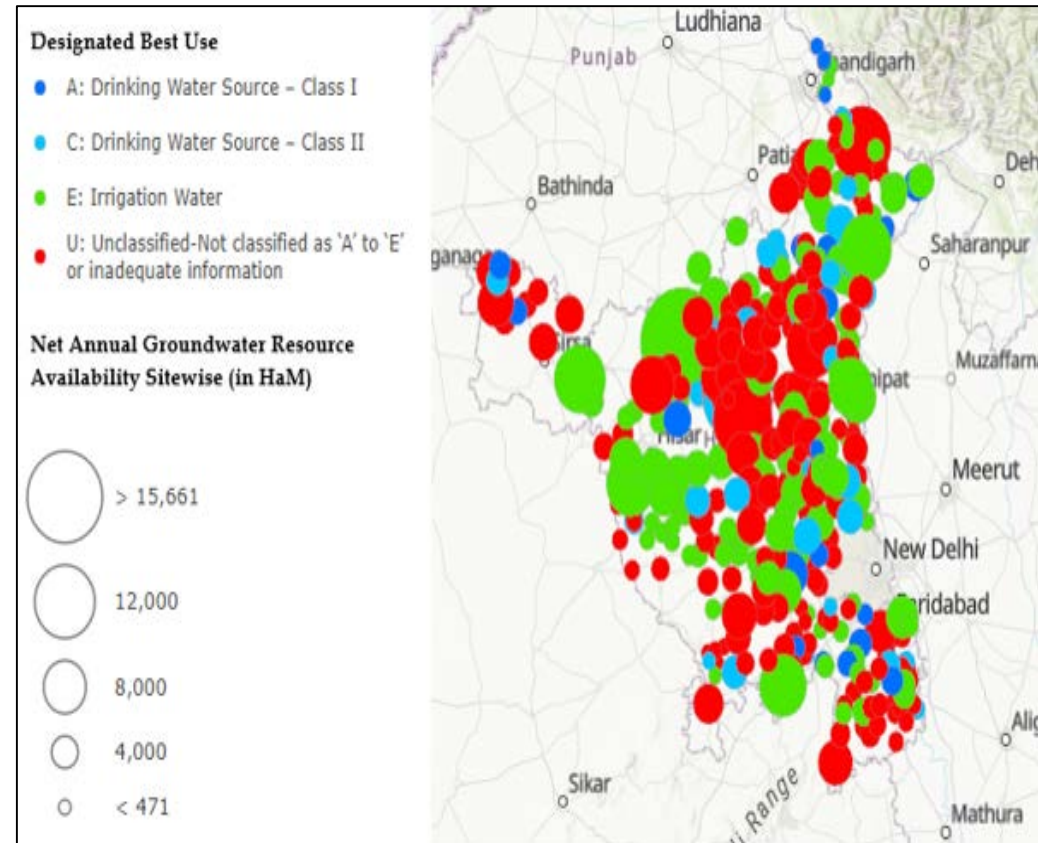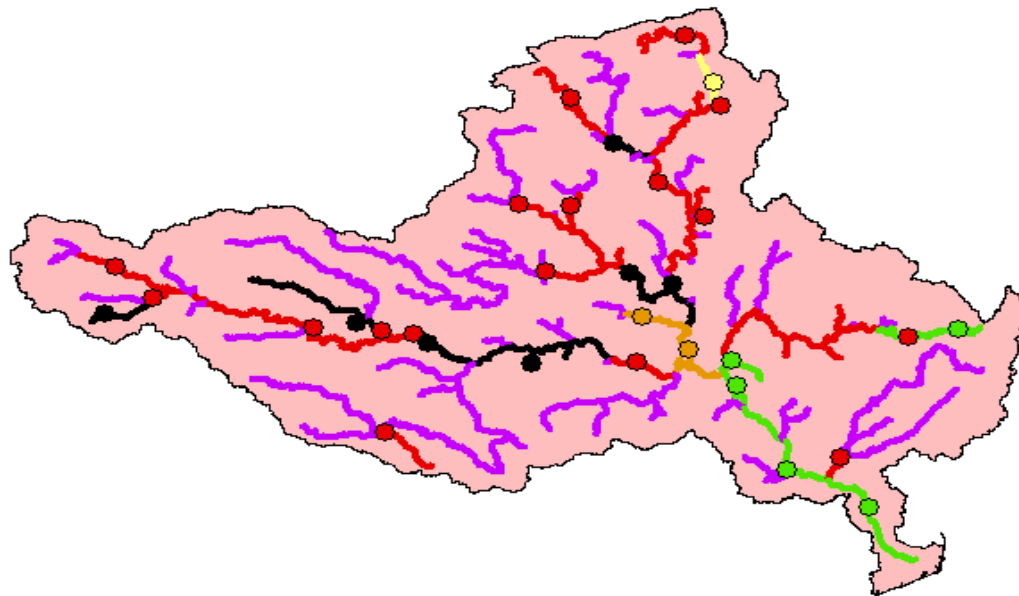| Quality Class	Year1						Year2					
	A	B	C	D	E	U	A	B	C	D	E	U
Monitoring Site 1												
Month1												
Month2												
.....												
Monitoring Site 2												
Month1												
Month2												
....												

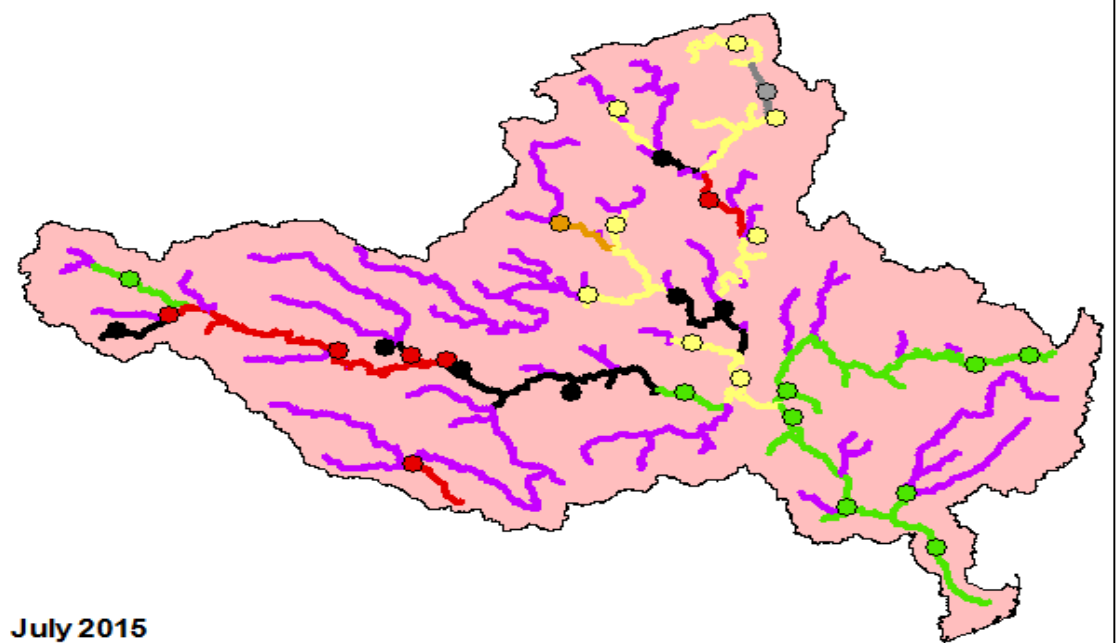# Status of Groundwater Quality 2015

Punjab
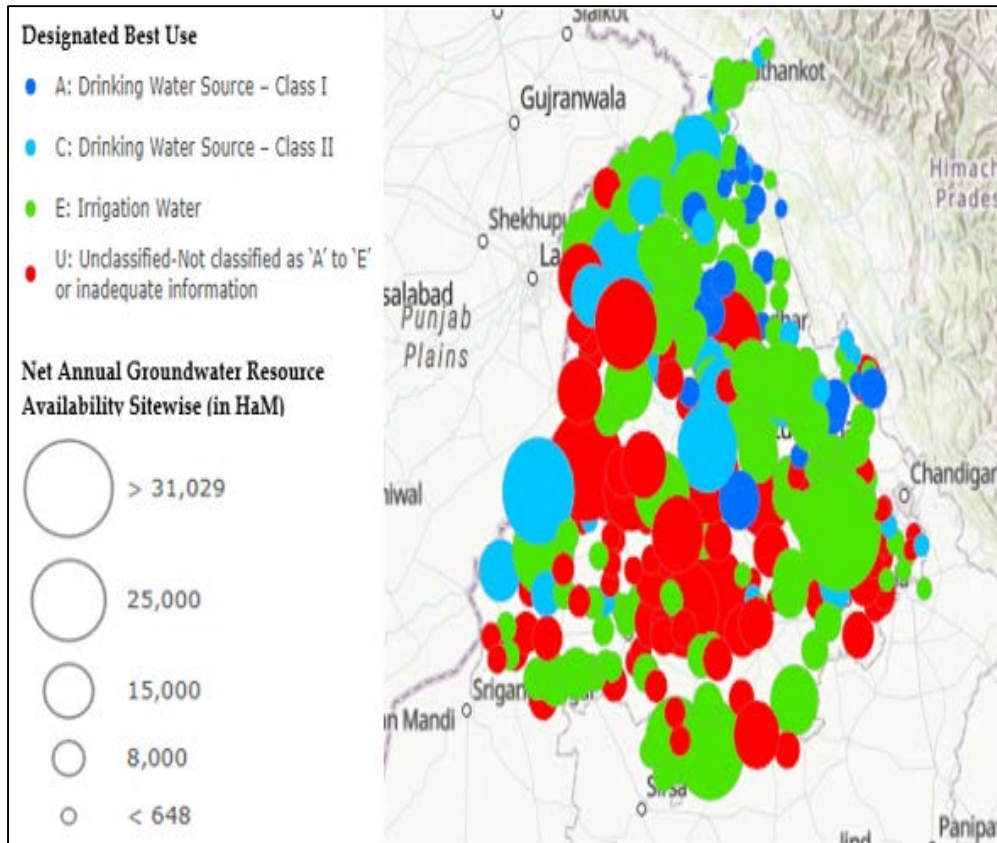
Haryana

Surface Water Quality Status of Godavari River Basin (month of June and July 2015)

June 2015

- ● No Monitoring Station Exists
- ● Stations not available under quality parameters
- ○ B
- ● E
- ● U: Not Classified as A to E or Quality Parameters Missing
- ● Z: Discharge=0

July 2015

- ● No Monitoring Station Exists
- ● Stations not available under quality parameters
- ○ B: Outdoor Bathing (Organised)
- ● D: Culture and wild life propagation
- ● E: Irrigation, Industrial cooling, controlled waste disposal
- ● U: Not Classified as A to E or Quality Parameters Missing
- ● Z: Discharge=0

Valuation of Cropland Ecosystem Services

Measuring "Provisioning of Crops"

- SEEA prescribes the use of 'resource rent method'

- Appropriation method - Actual payments made to owners in terms of rental value of owned land or rent paid for leased-in land
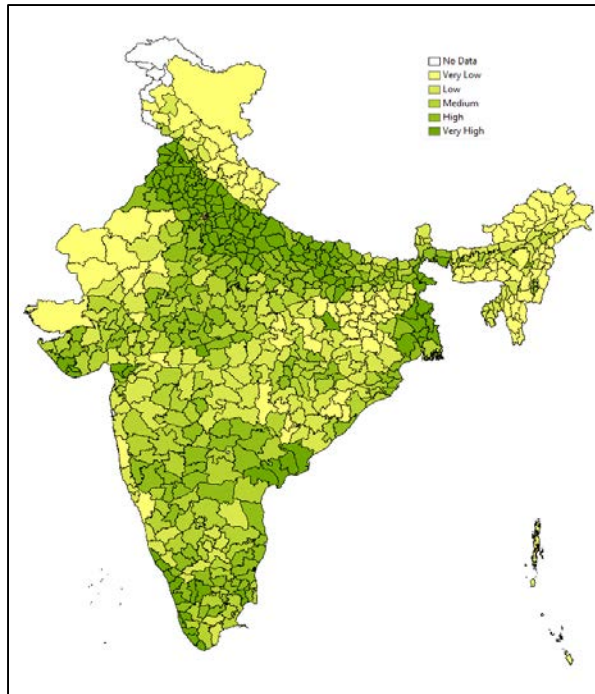
Sources of information in India:

- Cost of Cultivation Studies

- Information on Area, Production and Yield (APY) of major crops
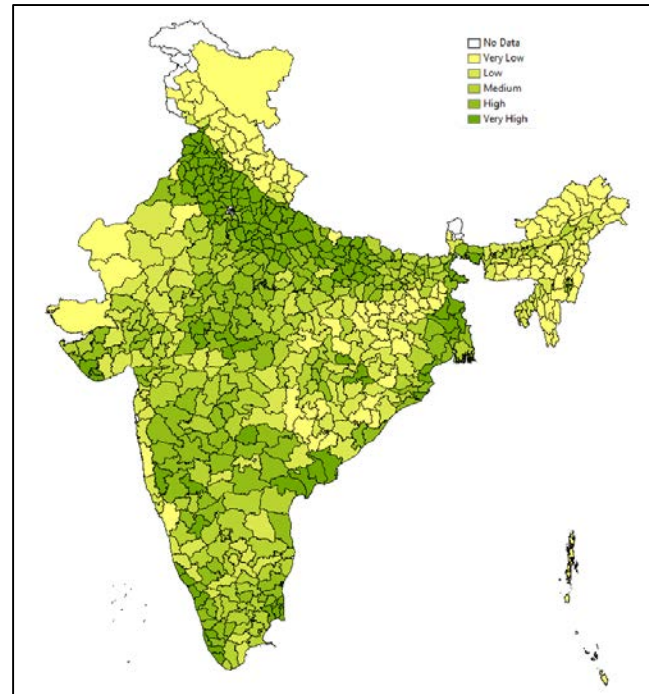
- Land Use Statistics

Map on crop provisioning service
(Quintile distribution of Cropland Ecosystem Services)
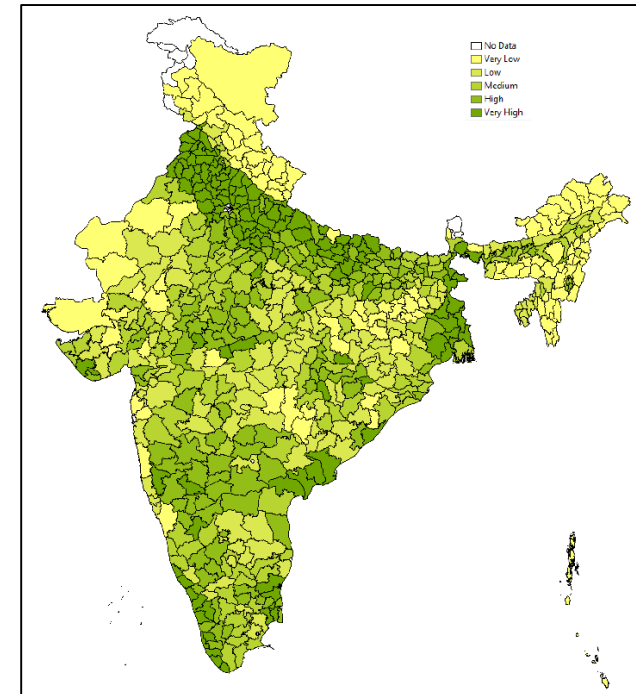
2014-15

2011-12

2005-06

Valuation of Nature-based Tourism Services

Valuation of Nature-based Tourism Services

Estimates derived for the years 2008-09 and 2014-15 for nature-based tourism

- **Tourists with 'holidaying, leisure and recreation' and 'pilgrimage and religion' as purpose**

- **Values derived as product of –**

➢ **Average expenditure incurred per person**

➢ **Number of tourists having the specified purposes**

➢ **Validated using 'Invest' module – Flickr Photo User Days**

District Map of Tourism

2008-09

2014-15

Low
Medium
High
Very High
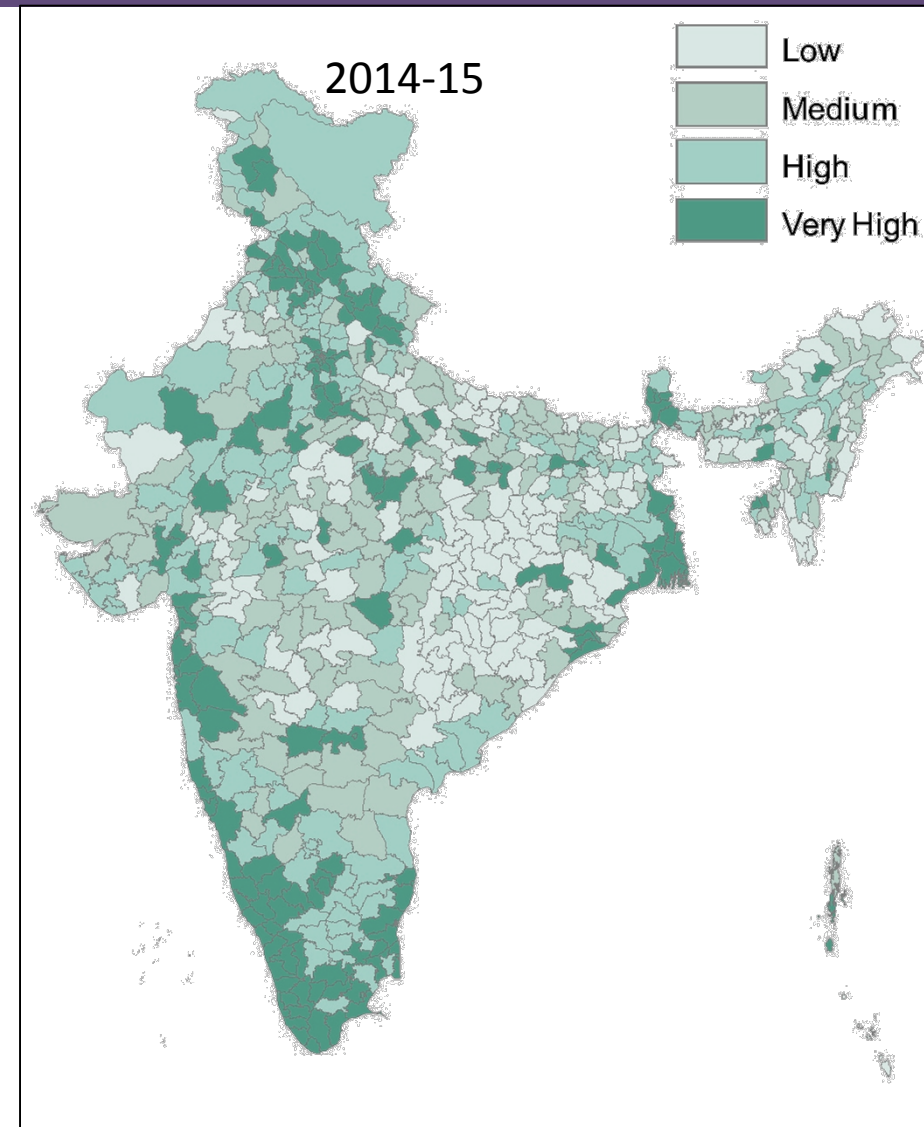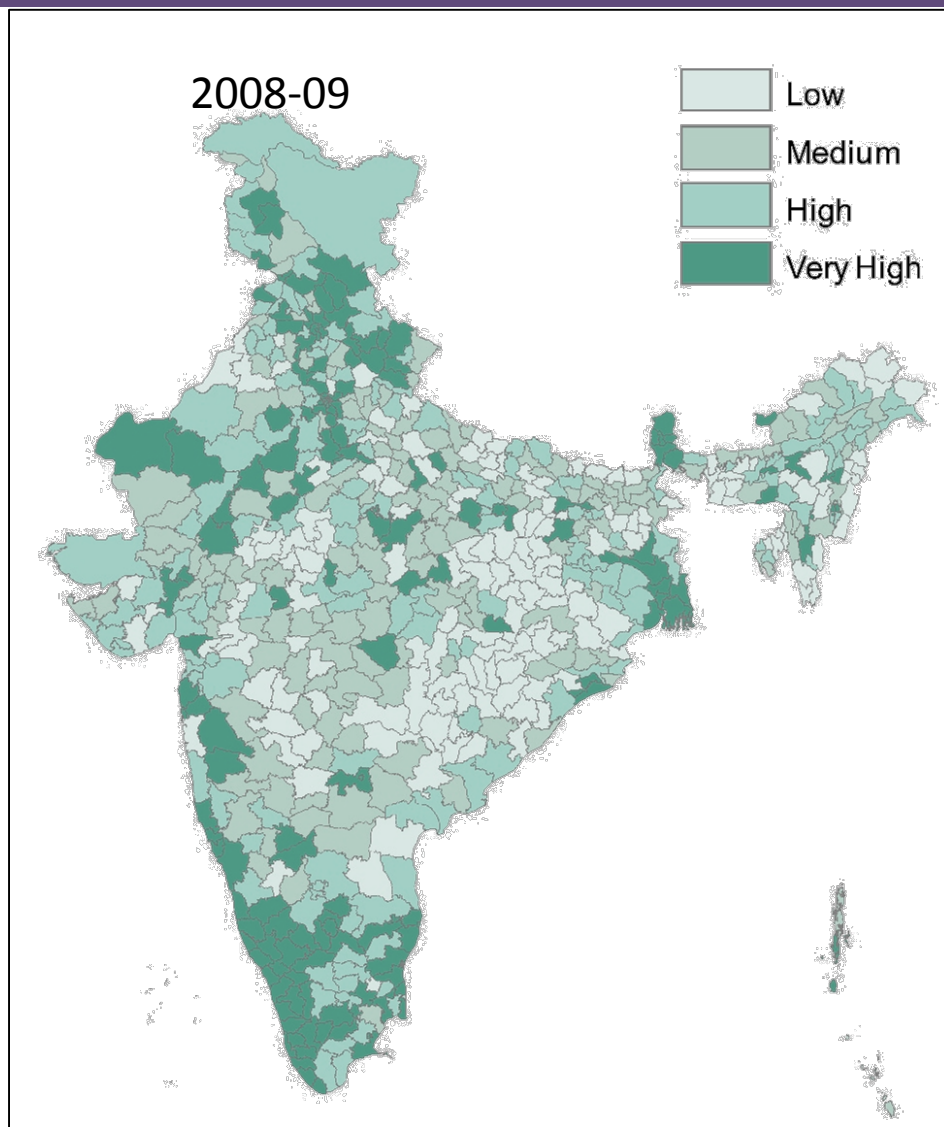
Pilot Study under NCAVES

Pilot Ecosystem Study in Karnataka

- **Institution:** Indian Institute of Science

- **Objective:** To pilot the use of ecosystem extent and condition and ecosystem services supply accounts in Karnataka State, India and to develop a scenario based assessment of an identified policy interventions.

- **Study Region:** Karnataka, 7 districts (representing 4 agro-climatic zones and part of Western Ghats – one among 36 global Biodiversity hotspots)

Institutional Arrangements

Ministry	Information/ data provided
Ministry of Mines	Metallic and non-metallic minerals (Proved, probable & remaining reserves of 85 minerals)
Ministry of Environment, Forests and Climate Change	Forest cover & area, growing stock, carbon stock, status of flora & fauna species, level of SO_2, NO_2, $PM10$ & $PM2.5$ etc
Ministry of Jal Shakti	Ground and surface water resources
Department of Agriculture and Co-operation	Production & yield, , status nutrient of soil (micro & macro nutrients)
Department of Animal Husbandry and Dairying	Livestock data
Department of Fisheries	Marine fisheries

Institutional Arrangements

Team Member	Information/ data provided
Ministry of Petroleum and Natural Gas	Availability of crude oil, petroleum products & natural gas
Ministry of Earth Sciences	Meteorological data, Major natural disasters in India
Ministry of Coal	Geological reserves of coal & lignite
National Remote Sensing Centre	Area under different land cover classes
Ministry of New and Renewable Energy	Solar photovoltaic systems, hydropower projects, potential of renewable power (State-wise), etc.
Department of Land Resources	Wasteland mapping and restoration

THANKS