Directorate of Water Management Bhubaneswar, Odisha

Geospatial Techniques for Identifying the Paddy Cultivated areas in Agro Climatic Region (ACR)-VI

Dr. Ranu Rani Sethi
Senior Scientist
Directorate of Water Management
(ICAR) Bhubaneswar, ODISHA

Introduction

- Paddy occupies largest area (45 Mha) with production of 134 million tonne
- Wheat area 27 Mha with production of 75.6 Million tonne
- Rice-wheat cropping system covers about 10.5 Mha in Indo Gangetic Planes
- Judicious water management technologies needed to enhance water productivity

Agro-climatic regions / zones in India

S.No.	Agro-climatic regions/zones	States represented
I	**Western Himalayan region**	Himachal Pradesh, Jammu & Kashmir, Uttarakhand
II	**Eastern Himalayan region**	Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, West Bengal
III	**Lower Gangetic plain region**	West Bengal
IV	**Middle Gangetic plain region**	Uttar Pradesh, Bihar
V	**Upper Gangetic plain region**	Uttar Pradesh
VI	**Trans Gangetic plain region**	Chandigarh, Delhi, Haryana, Punjab, Rajasthan
VII	**Eastern plateau and hills region**	Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Orissa, West Bengal
VIII	**Central plateau and hills region**	Madhya Pradesh, Rajasthan, Uttar Pradesh
IX	**Western plateau and hills region**	Madhya Pradesh, Maharashtra
X	**Southern plateau and hills region**	Andhra Pradesh, Karnataka, Tamil Nadu
XI	**East coast plains and hills region**	Andhra Pradesh, Orissa, Pondicherry, Tamil Nadu
XII	**West coast plains and ghat region**	Goa, Karnataka, Kerala, Maharashtra, Tamil Nadu
XIII	**Gujarat plains and hills region**	Gujarat, Dadra & Nagar Haveli, Daman & Diu
XIV	**Western dry region**	Rajasthan
XV	**Island region**	Andman & Nicobar Islands, Lakshdweep

Source : Planning Commission (Khanna, 1989) has identified 15 resource development regions in the country, 14 in the main land and remaining one in the islands of Bay of Bengal and Arabian Sea.

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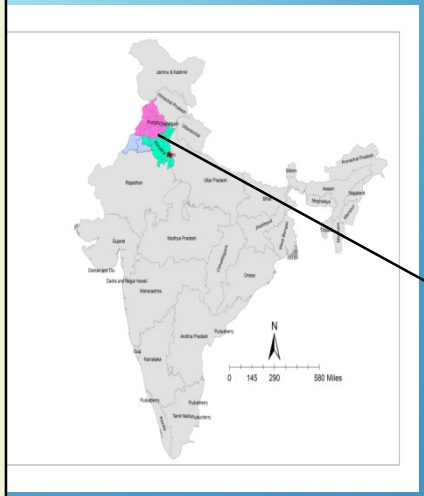
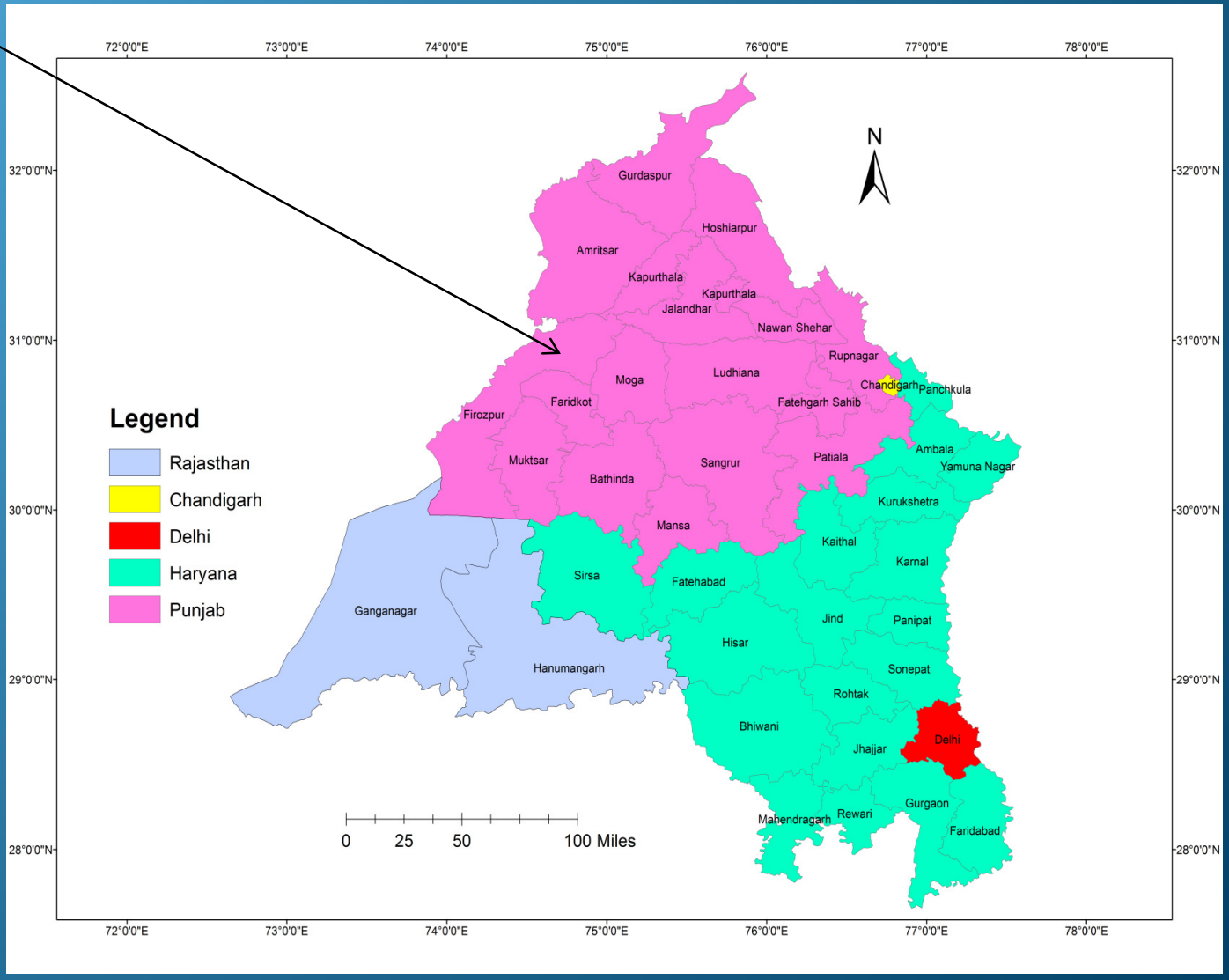


Agro Climatic Region-VI



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Crop Period

State	Crop	Season	From	To	Period
Punjab	Rice/Paddy	Kharif	May	July	Sowing
			September	October	Harvesting
		Rabi	January	January	Sowing
	Wheat	Rabi	October	November	Sowing
			April	May	Harvesting
Haryana	Rice/Paddy	Kharif	January	December	Sowing
		Kharif	June	July	Sowing
			October	November	Harvesting
	Wheat	Rabi	October	December	Sowing
			April	April	Harvesting

Strength

- Rainfall varies from 190 mm to 1,150 mm
- Important sources for irrigation: Beas, Ravi, Sutlej, Yamuna and Ghaggar rivers
- Phenomenal increase in agricultural productivity referred as Green Revolution

Emerging Issues

i. Declining Soil health
ii. Over exploitation of ground water resources
iii. Variability in climatic parameters
iv. Falling diversity in the cropping pattern

Objectives

- To find out uniformity of information related to crop coverage.
- To provide support to the field research and to assist in the decision making process

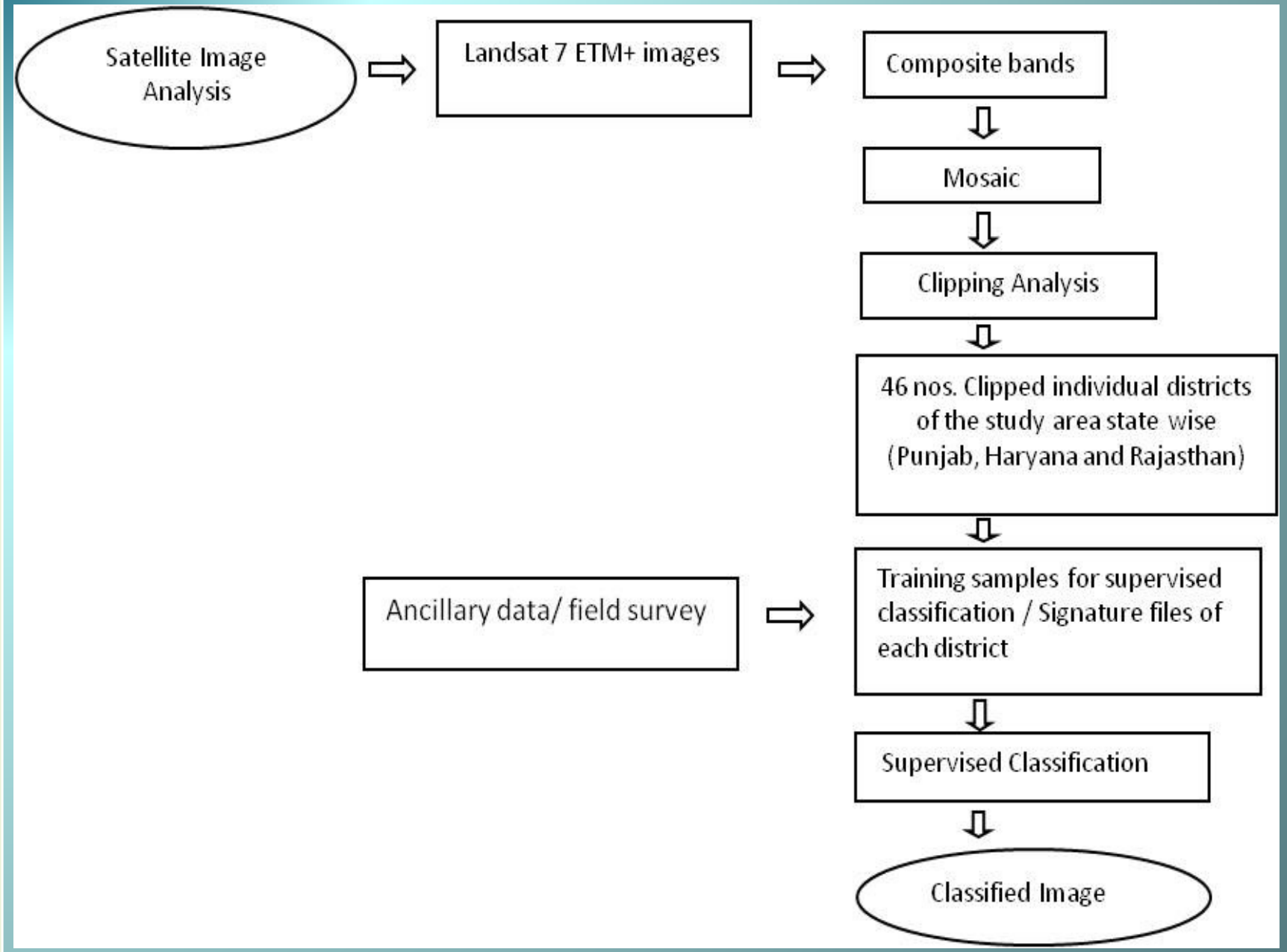
Geospatial Analysis

"A powerful set of tools for storing, retrieving, transforming and displaying spatial data from the real world for a particular set of purposes"

Methodology

Software	Raster Analysis	Vector Analysis
Arc GIS 10.0	Mosaic Composing bands Supervised Classification **Data used: Landsat ETM+ images**	Digitization Overlay Clipping Krigging, Thematic mapping **Data used : Analog Maps, Numerical values in Excel Sheet**

Process for Image Classification



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Details of Landsat data

Sl. No.	Path-Row	Month, Year	Sensor	No. of Bands	Spatial Resolution / Pixel Dimension (m^2)	Total no. of images
1	146-40	October,2000	ETM+	8	60×60	
2	146-41	October,2000	ETM+	8	60×60	
3	147-38	October,2000	ETM+	8	60×60	
4	147-39	September,2000	ETM+	8	60×60	
5	147-40	September,2000	ETM+	8	60×60	
6	147-41	September,2000	ETM+	8	60×60	
7	148-38	October,2000	ETM+	8	60×60	
8	148-39	October,2000	ETM+	8	60×60	
9	148-40	October,2000	ETM+	8	60×60	
10	149-38	October,2000	ETM+	8	60×60	
11	149-39	October,2000	ETM+	8	60×60	**12**
12	149-40	October,2000	ETM+	8	60×60	

Source Site: http://glcf.umd.edu

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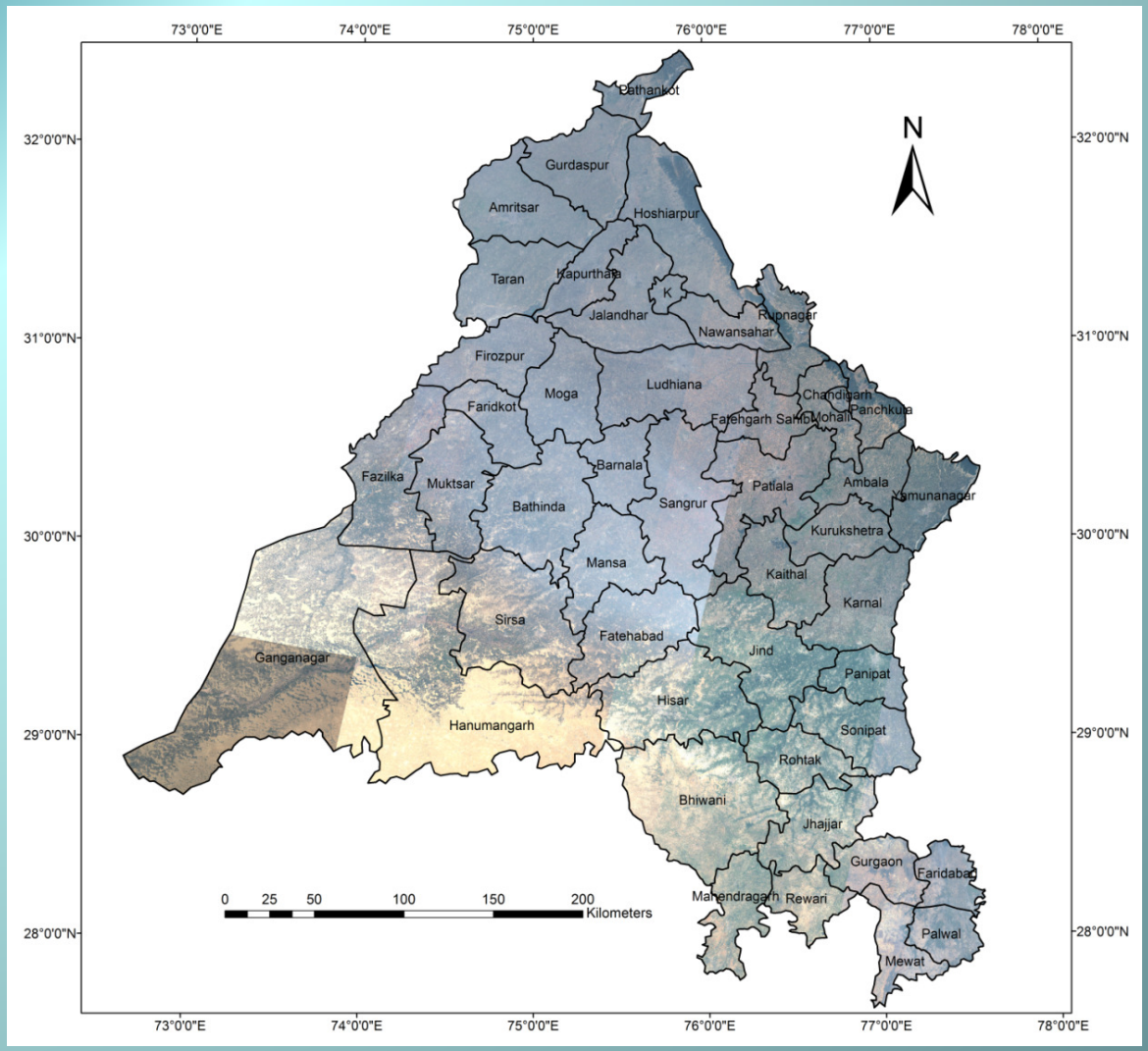
Satellite Image of ACR VI



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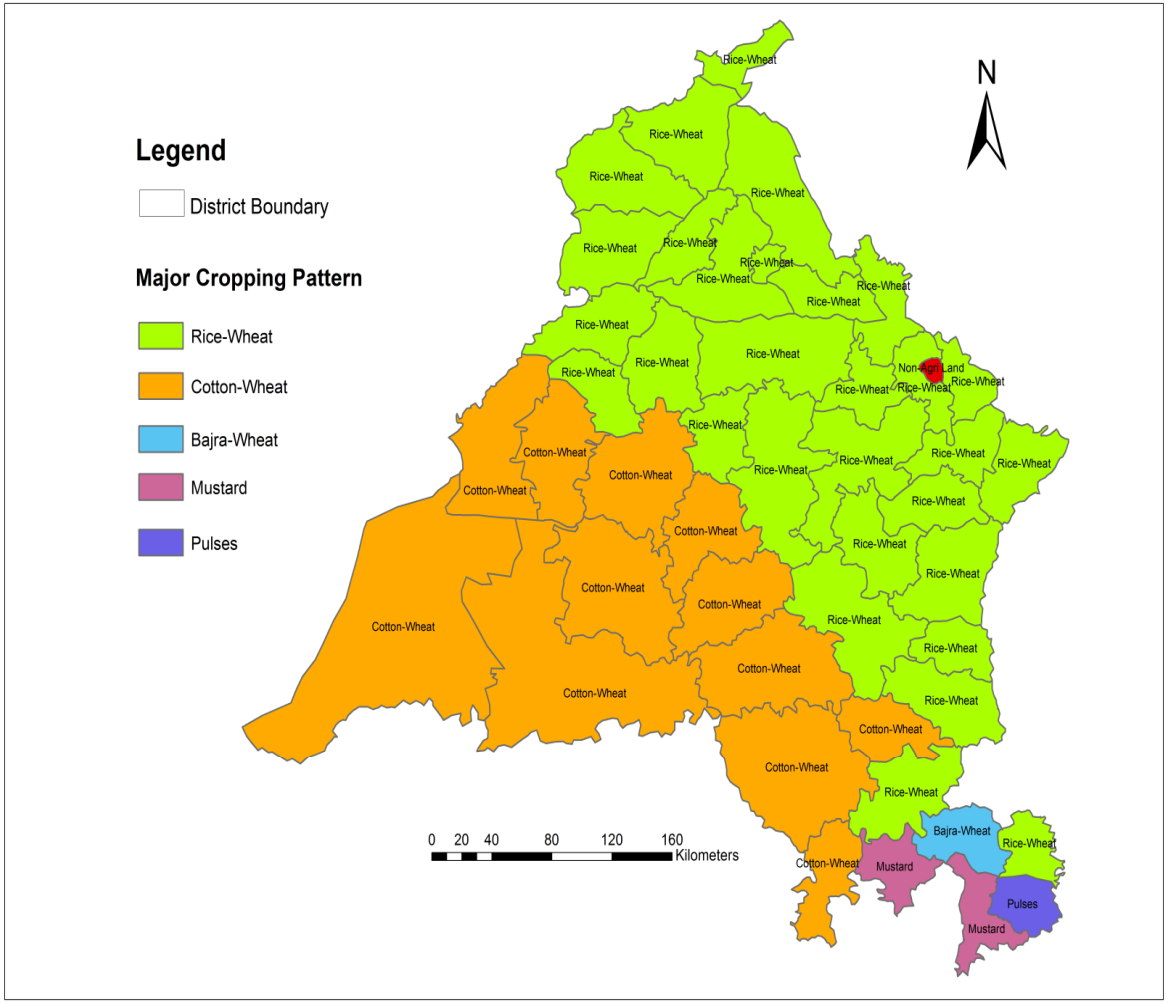
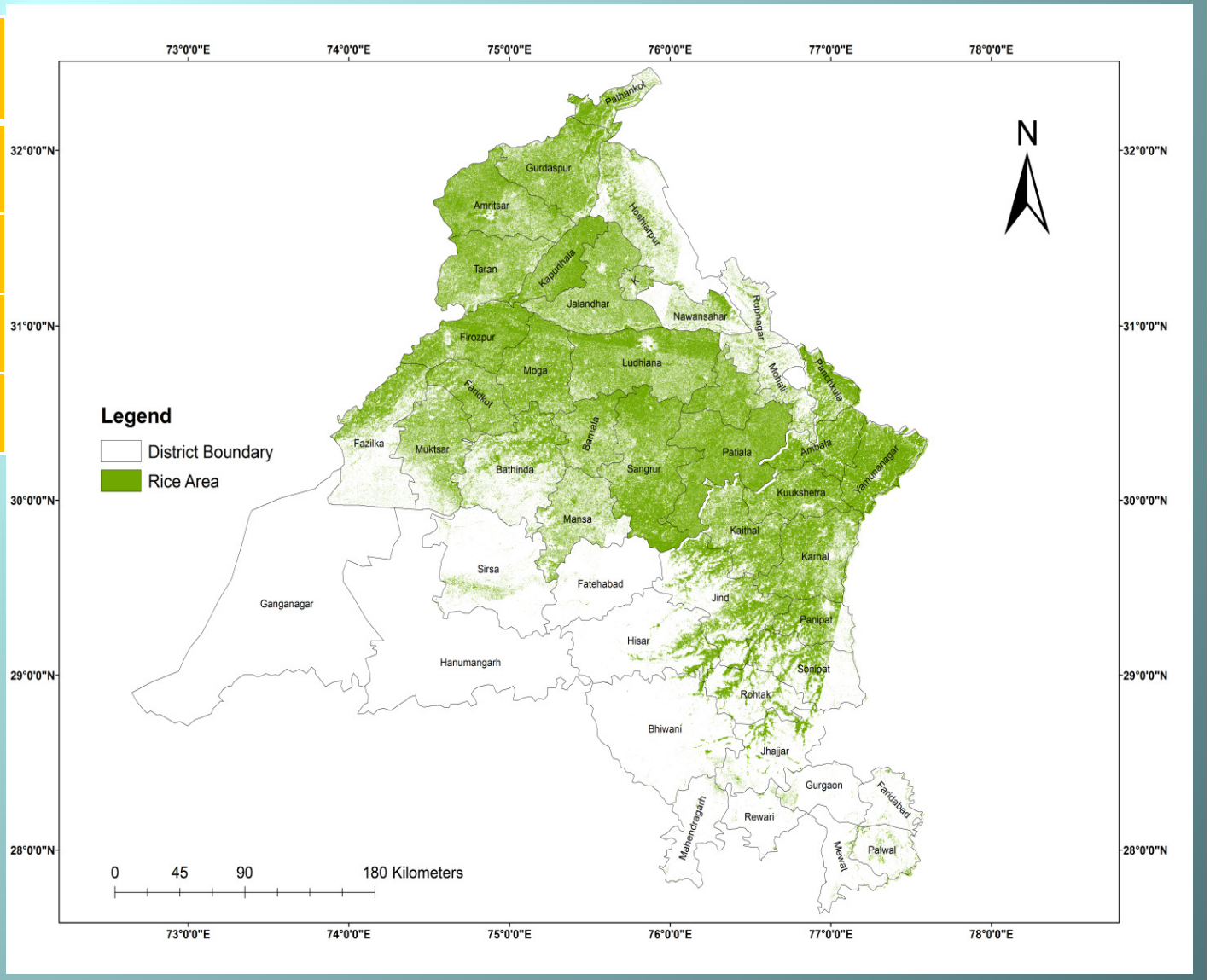
Major Cropping Pattern



Paddy Cultivated Area (Geo spatial analysis)

Geographical Area ('000 ha)	
ACR VI	11410.3
Punjab	4969.3
Haryana	4380.8
Rajasthan	2060.2

Paddy Area Remote Sensing analysis ('000 ha)	
Punjab	2626
Haryana	1051



Comparison of cropped area

State	No. of Districts in ACR VI	Area under Rice (Published reports) '000 ha	Area under Rice (Image Classification Analysis) '000 ha
Punjab	23	2611	2626
Haryana	21	1049	1051
Rajasthan	2	Nil	Nil

Acknowledgements

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THANK YOU