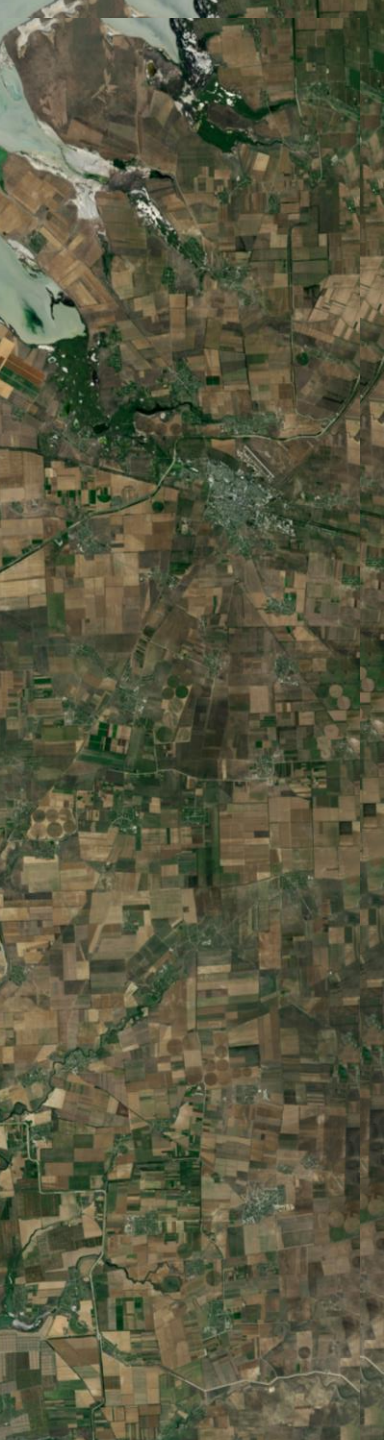
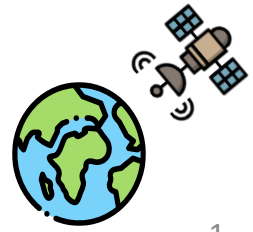


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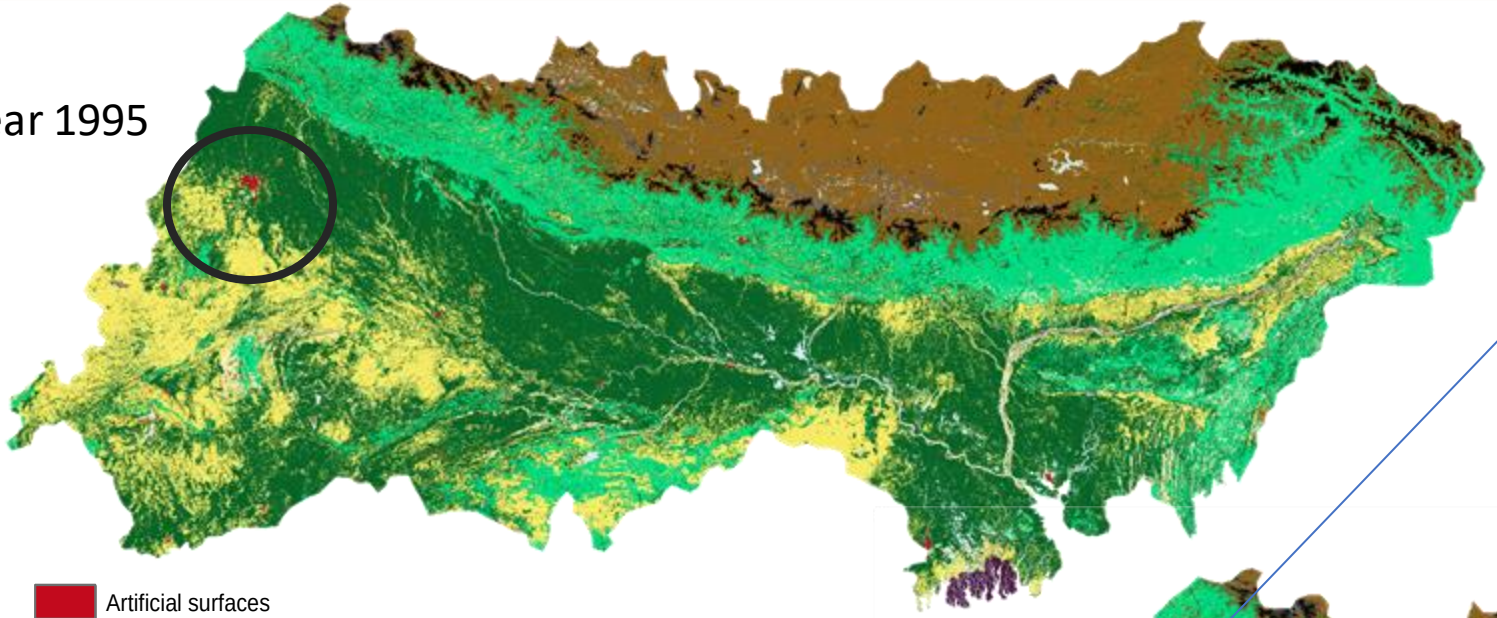
Mapping Land Cover Change

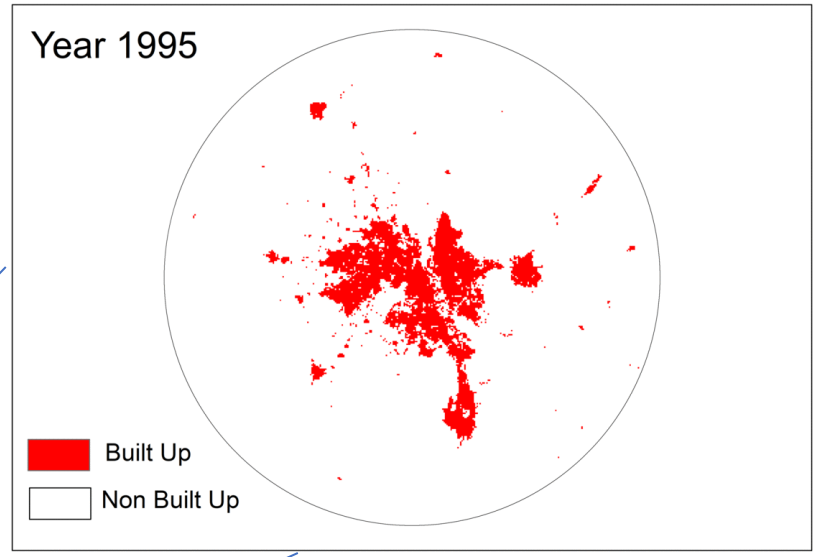
Land Accounting for Sustainable Development using Remote Sensing and GIS

Presented By: Aahlaad Musunuru
aahlaadmusunuru1995@gmail.com

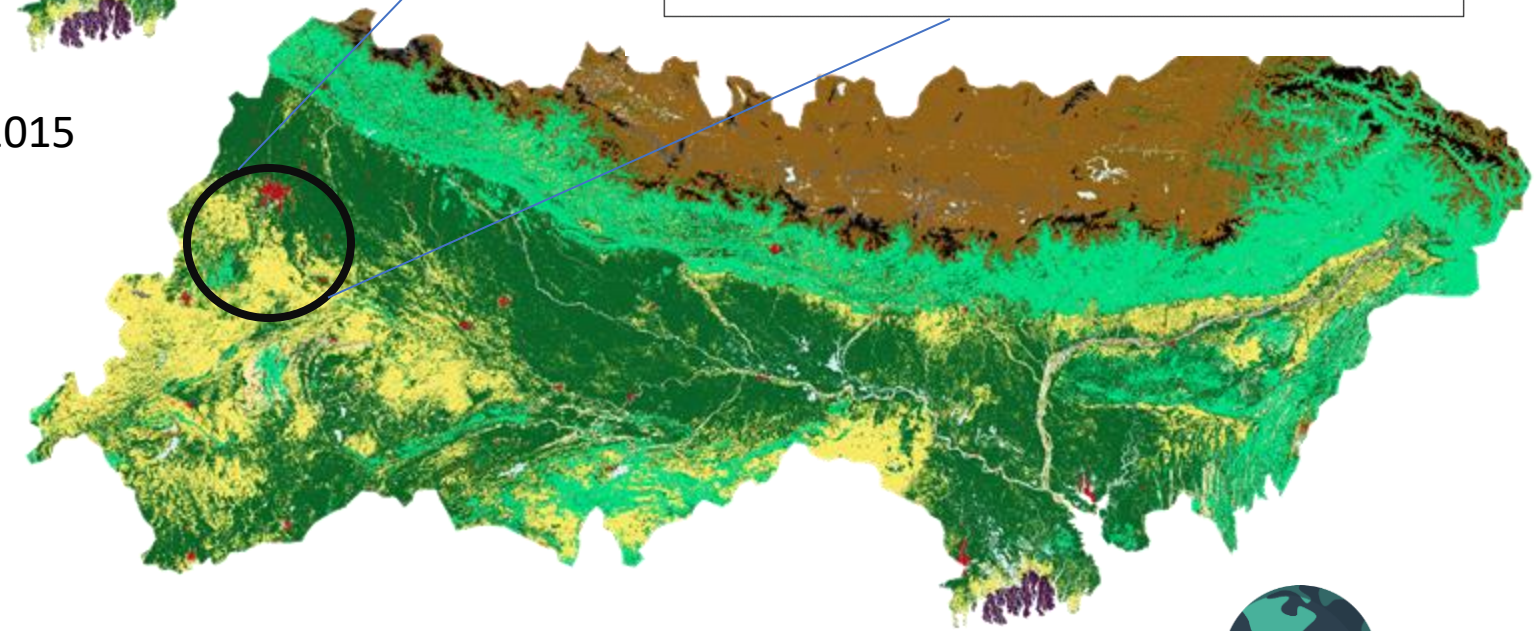


Mapping Land Cover Change





Year 2015



- Artificial surfaces
- Herbaceous crops
- Woody crops
- Multiple or layered crops
- Graslands
- tree-covered areas
- Mangroves
- Shrub-covered areas
- Shrubs and/or herbaceous vegetation, aquatic or regularly flood
- Sparsely natural vegetated areas
- Terrestrial barren land
- Permanent snow and glaciers
- Inland water bodies

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Mapping Land Cover Change

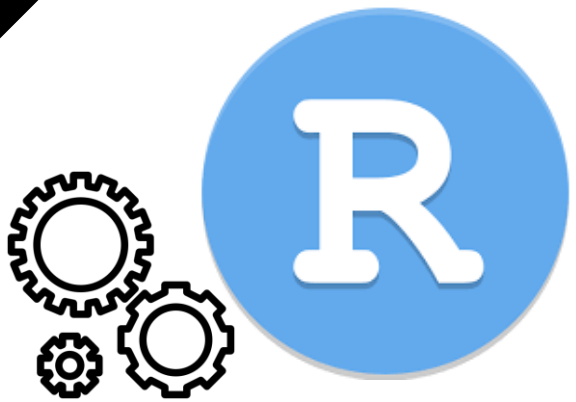
DOWNLOAD DATA



CLEAN DATA



PROCESS DATA



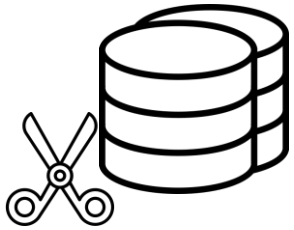


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https://datacatalog.worldbank.org/dataset/major-river-basins-world

World Bank

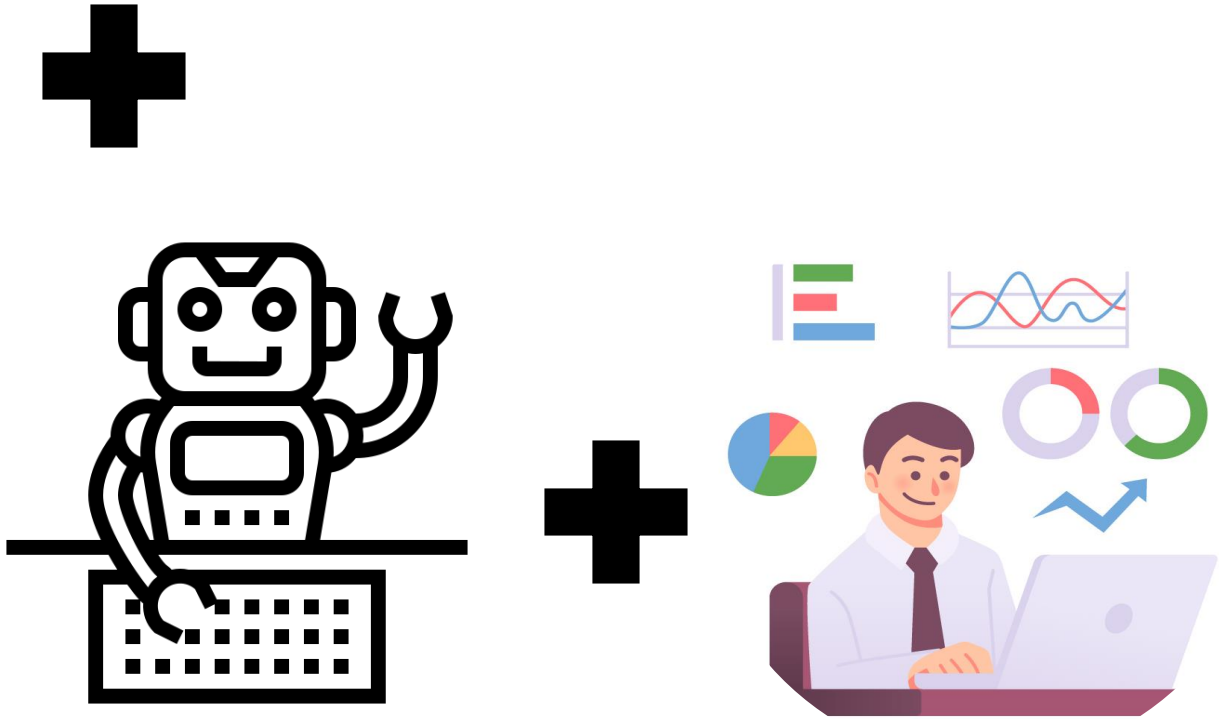


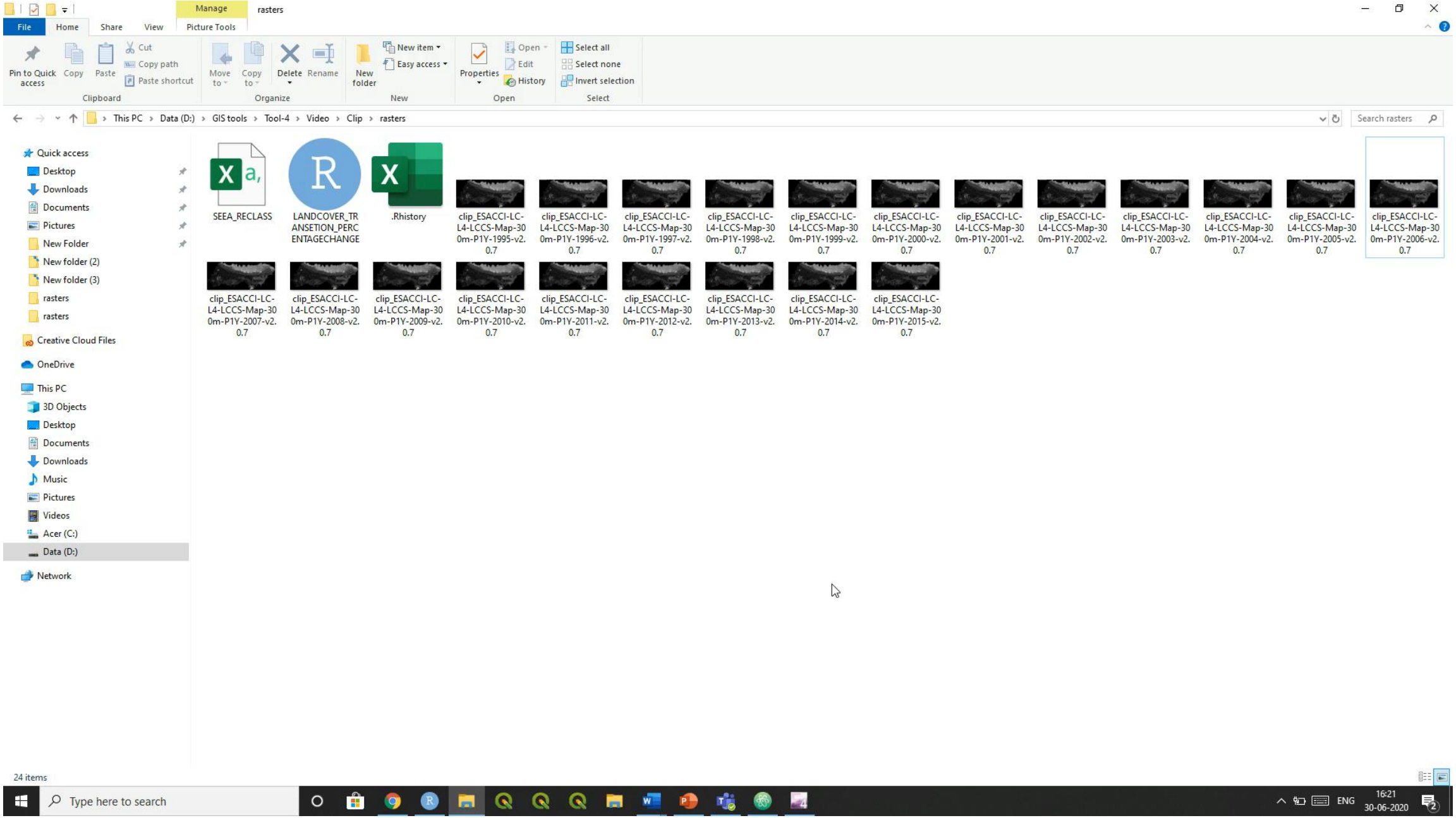


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Mapping Land Cover Change

Sensor	Available From	Resolution	Data Source	Service
Landsat 1 to 3	1972-1989	30M	https://earthexplorer.usgs.gov	Free
Landsat 4-5TM	1982-2012	30M	https://earthexplorer.usgs.gov	Free
Landsat 7	1999-Present	30M	https://earthexplorer.usgs.gov	Free
Landsat 8	2013	30M	https://earthexplorer.usgs.gov	Free
Aster	1999	30M	https://earthexplorer.usgs.gov	Free
Sentinel	2015	10M	https://earthexplorer.usgs.gov	Free
Modis	2003-Present	250M, 500M, 1km, 5Km	https://search.earthdata.nasa.gov	Free
ESA	1992-2018	300M	ftp://geo10.elie.ucl.ac.be/v207/	Free




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Picture Tools
Pin to Quick access
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New folder
New item
Easy access
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
This PC › Data (D:) › GIS tools › Tool-4 › Video › Clip › rasters
Search rasters
Quick access
Desktop
Downloads
Documents
Pictures
New Folder
New folder (2)
New folder (3)
rasters
rasters
Creative Cloud Files
OneDrive
This PC
3D Objects
Desktop
Documents
Downloads
Music
Pictures
Videos
Acer (C:)
Data (D:)
Network
SEEA_RECLASS
LANDCOVER_TRANSETION_PERCENTAGECHANGE
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Mapping Land Cover Change

Land Cover Change Matrix - Ganges Brahmaputra River Basin

Year 1995 Land Cover in square km	Year 2015 Land Cover in square km													
		1	2	3	4	5	6	7	8	9	10	11	12	13	Sum - Year 1995
	1	2,975.50	-	-	-	-	-	-	-	-	-	-	-	-	2,975.50
	2	2,873.40	298,789.80	0.60	113.00	284.30	665.50	23.80	12.20	0.40	2.50	108.10	-	546.60	303,420.20
	3	5.50	-	2,375.70	0.20	0.30	2.90	-	-	-	-	-	-	-	2,384.60
	4	3,773.70	21.50	0.70	673,849.60	1,879.10	4,375.10	39.10	23.10	0.40	11.90	133.30	-	400.40	684,508.00
	5	289.00	807.90	0.40	819.90	293,469.90	251.50	4.00	2.10	0.60	223.40	900.50	-	623.20	297,392.40
	6	85.60	1,385.90	27.80	5,369.90	100.70	325,296.30	0.50	525.00	20.10	-	1.00	-	27.90	332,840.70
	7	2.50	11.20	-	18.10	0.90	18.20	5,341.00	0.10	0.10	-	-	-	102.90	5,494.90
	8	50.70	1,720.00	59.30	2,669.80	78.60	8,376.60	26.60	24,573.20	1.00	0.10	2.40	-	9.20	37,567.30
	9	0.20	-	-	2.40	-	8.90	0.20	-	667.20	-	-	-	1.40	680.30
	10	5.00	2.70	-	3.20	689.00	-	-	-	-	1,673.60	11.70	-	5.10	2,390.50
	11	3.90	43.10	-	30.00	4,589.90	-	-	1.60	-	209.60	23,205.80	-	14.80	28,098.60
	12	-	-	-	-	-	-	-	-	-	-	-	32,579.00	-	32,579.00
	13	68.70	161.80	0.20	125.50	324.40	84.60	19.20	1.10	2.20	13.40	304.80	-	31,610.90	32,716.80
	Sum - Year 2015	10,133.60	302,944.00	2,464.70	683,001.60	301,417.10	339,079.50	5,454.30	25,138.30	692.10	2,134.50	24,667.70	32,579.00	33,342.30	1,763,048.70

1 Artificial surface
2 Herbaceous crop
3 Woody area
4 Multiple or Layered crop
5 Grassland
6 Tree cover areas
7 Mangrove
8 Shrub cover areas
9 Shrubs and or herbaceous areas
10 Sparsely natural vegetated areas
11 Terrestrial barren land
12 Permanent snow and glacier
13 In land water Bodies

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Mapping Land Cover Change

Land Cover Change Matrix - Ganges Brahmaputra River Basin															
		Year 2015 Land Cover in square km													
Year 1995 Land Cover in square km		1	2	3	4	5	6	7	8	9	10	11	12	13	Sum - Year 1995
	1	2,975.50	-	-	-	-	-	-	-	-	-	-	-	-	2,975.50
	2	2,873.40	298,789.80	0.60	113.00	284.30	665.50	23.80	12.20	0.40	2.50	108.10	-	546.60	303,420.20
	3	5.50	-	2,375.70	0.20	0.30	2.90	-	-	-	-	-	-	-	2,384.60
	4	3,773.70	21.50	0.70	673,849.60	1,879.10	4,375.10	39.10	23.10	0.40	11.90	133.30	-	400.40	684,508.00
	5	289.00	807.90	0.40	819.90	293,469.90	251.50	4.00	2.10	0.60	223.40	900.50	-	623.20	297,392.40
	6	85.60	1,385.90	27.80	5,369.90	100.70	325,296.30	0.50	525.00	20.10	-	1.00	-	27.90	332,840.70
	7	2.50	11.20	-	18.10	0.90	18.20	5,341.00	0.10	0.10	-	-	-	102.90	5,494.90
	8	50.70	1,720.00	59.30	2,669.80	78.60	8,376.60	26.60	24,573.20	1.00	0.10	2.40	-	9.20	37,567.30
	9	0.20	-	-	2.40	-	8.90	0.20	-	667.20	-	-	-	1.40	680.30
	10	5.00	2.70	-	3.20	689.00	-	-	-	-	1,673.60	11.70	-	5.10	2,390.50
	11	3.90	43.10	-	30.00	4,589.90	-	-	1.60	-	209.60	23,205.80	-	14.80	28,098.60
	12	-	-	-	-	-	-	-	-	-	-	-	32,579.00	-	32,579.00
	13	68.70	161.80	0.20	125.50	324.40	84.60	19.20	1.10	2.20	13.40	304.80	-	31,610.90	32,716.80
	Sum - Year 2015	10,133.60	302,944.00	2,464.70	683,001.60	301,417.10	339,079.50	5,454.30	25,138.30	692.10	2,134.50	24,667.70	32,579.00	33,342.30	1,763,048.70
			4,154.10												

4,630.40

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Mapping Land Cover Change

Land Cover Change Matrix - Ganges Brahmaputra River Basin

Year 1995 Land Cover in square km	Year 2015 Land Cover in square km														
	1	2	3	4	5	6	7	8	9	10	11	12	13	Sum - Year 1995	
1	2,975.50	-	-	-	-	-	-	-	-	-	-	-	-	2,975.50	
2	2,873.40	298,789.80	0.60	113.00	284.30	665.50	23.80	12.20	0.40	2.50	108.10	-	546.60	303,420.20	4,630.40
3	5.50	-	2,375.70	0.20	0.30	2.90	-	-	-	-	-	-	-	2,384.60	
4	3,773.70	21.50	0.70	673,849.60	1,879.10	4,375.10	39.10	23.10	0.40	11.90	133.30	-	400.40	684,508.00	
5	289.00	807.90	0.40	819.90	293,469.90	251.50	4.00	2.10	0.60	223.40	900.50	-	623.20	297,392.40	
6	85.60	1,385.90	27.80	5,369.90	100.70	325,296.30	0.50	525.00	20.10	-					
7	2.50	11.20	-	18.10	0.90	18.20	5,341.00	0.10	0.10	-					
8	50.70	1,720.00	59.30	2,669.80	78.60	8,376.60	26.60	24,573.20	1.00	0.10					
9	0.20	-	-	2.40	-	8.90	0.20	-	667.20	-					
10	5.00	2.70	-	3.20	689.00	-	-	-	-	1,673.60					
11	3.90	43.10	-	30.00	4,589.90	-	-	1.60	-	209.60					
12	-	-	-	-	-	-	-	-	-	-					
13	68.70	161.80	0.20	125.50	324.40	84.60	19.20	1.10	2.20	13.40	304.80	-	31,610.90	32,716.80	
Sum - Year 2015	10,133.60	302,944.00	2,464.70	683,001.60	301,417.10	339,079.50	5,454.30	25,138.30	692.10	2,134.50	24,667.70	32,579.00	33,342.30	1,763,048.70	
		4,154.10													

EXAMPLE - HERBACEOUS CROPS

303,420.20 Amount in sq. km. of **Herbaceous Crops Year 1995**

4,154.10 Total Amount in sq. km. that **adds to Herbaceous Crops**

4,630.40 Total Amount in sq. km. that **reduces Herbaceous Crops**

302,943.90 Amount in sq. km. of **Herbaceous Crops Year 2015**

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Mapping Land Cover Change

Land Cover Change Matrix - Ganges Brahmaputra River Basin

Year 1995 Land Cover in square km \ Year 2015 Land Cover in square km	1	2	3	4	5	6	7	8	9	10	11	12	13	Sum - Year 1995
1	2,975.50	-	-	-	-	-	-	-	-	-	-	-	-	2,975.50
2	2,873.40	298,789.80	0.60	113.00	284.30	665.50	23.80	12.20	0.40	2.50	108.10	-	546.60	303,420.20
3	5.50	-	2,375.70	0.20	0.30	2.90	-	-	-	-	-	-	-	2,384.60
4	3,773.70	21.50	0.70	673,849.60	1,879.10	4,375.10	39.10	23.10	0.40	11.90	133.30	-	400.40	684,508.00
5	289.00	807.90	0.40	819.90	293,469.90	251.50	4.00	2.10	0.60	223.40	900.50	-	623.20	297,392.40
6	85.60	1,385.90	27.80	5,369.90	100.70	325,296.30	0.50	525.00	20.10	-	1.00		27.00	332,840.70
7	2.50	11.20	-	18.10	0.90	18.20	5,341.00	0.10	0.10	-				
8	50.70	1,720.00	59.30	2,669.80	78.60	8,376.60	26.60	24,573.20	1.00	0.10				
9	0.20	-	-	2.40	-	8.90	0.20	-	667.20	-				
10	5.00	2.70	-	3.20	689.00	-	-	-	-	1,673.60				
11	3.90	43.10	-	30.00	4,589.90	-	-	1.60	-	209.60				
12	-	-	-	-	-	-	-	-	-	-				
13	68.70	161.80	0.20	125.50	324.40	84.60	19.20	1.10	2.20	13.40				
Sum - Year 2015	10,133.60	302,944.00	2,464.70	683,001.60	301,417.10	339,079.50	5,454.30	25,138.30	692.10	2,134.50	24,667.70	32,579.00	33,342.30	1,763,048.70

EXAMPLE - ARTIFICIAL SURFACE

2,975.50 Amount in sq. km. of **Artificial Surface Year 1995**

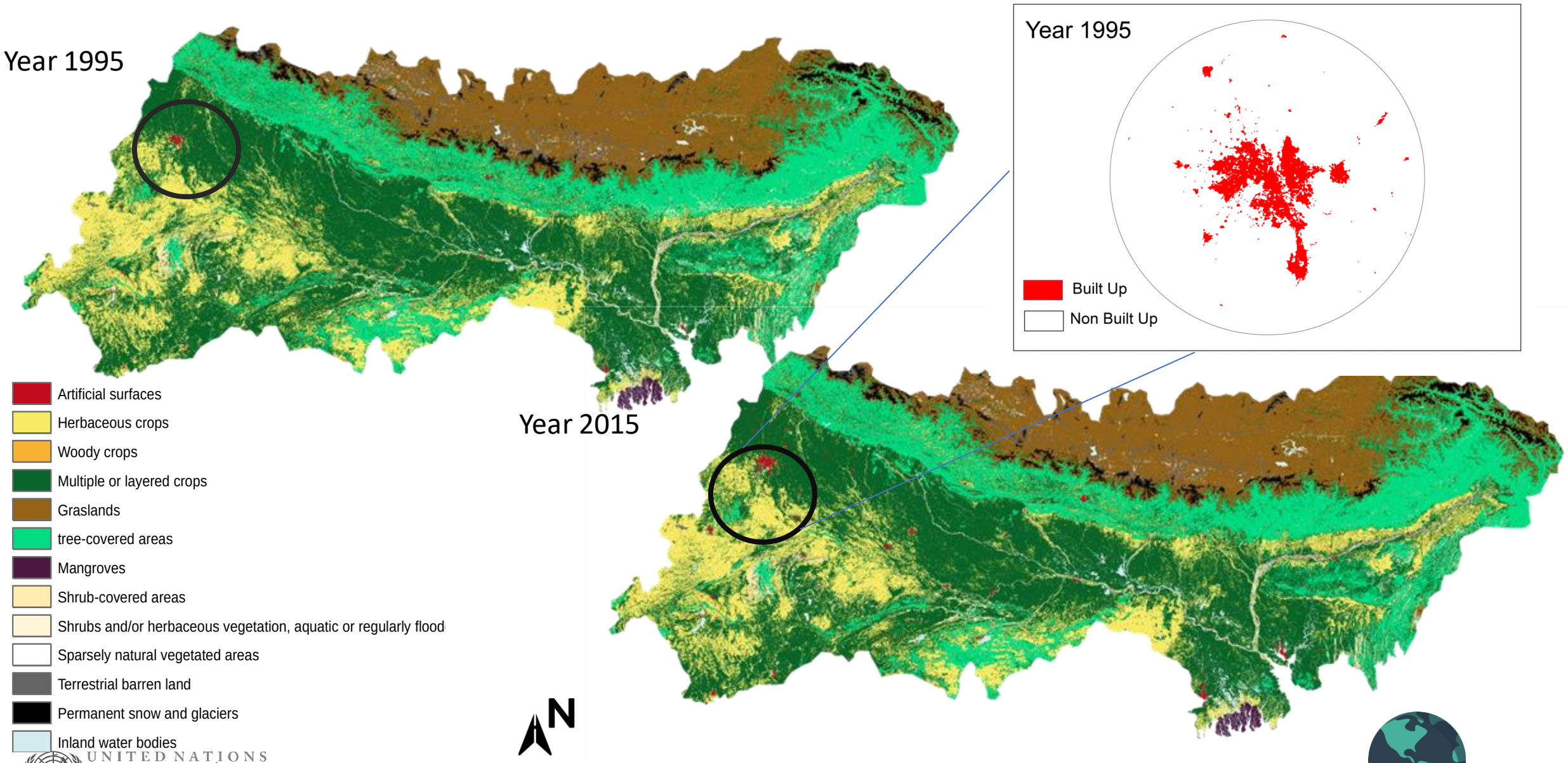
7,158.20 Total Amount in sq. km. that **adds to Artificial Surface**

- Total Amount in sq. km. that **reduces Artificial Surface**

10,133.70 Amount in sq. km. of **Artificial Surface Year 2015**

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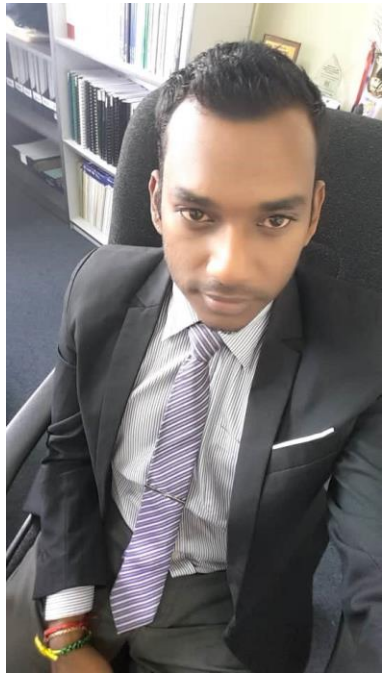
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Mapping Land Cover Change

Testing the land accounting tools with Fiji Bureau of Statistics



Bimlesh Krishna
Chief Statistician
Economic Statistics Division



Artika Devi
Senior Statistician
National Accounts & Sector Satellite Accounts



Ashish Chand
Statistician
Sector Satellite Accounts



Litia Kurisaqila-Mate
Assistant Statistician
Sector Satellite Accounts

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Mapping Land Cover Change

- What ***YOU*** can do today!

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  Download R Studio https://rstudio.com/products/rstudio/download/

  Explore GIS data

Sensor	Available From	Resolution	Data Source	Service
Landsat 1 to 3	1972-1989	30M	https://earthexplorer.usgs.gov	Free
Landsat 4-5TM	1982-2012	30M	https://earthexplorer.usgs.gov	Free
Landsat 7	1999-Present	30M	https://earthexplorer.usgs.gov	Free
Landsat 8	2013	30M	https://earthexplorer.usgs.gov	Free
Aster	1999	30M	https://earthexplorer.usgs.gov	Free
Sentinel	2015	10M	https://earthexplorer.usgs.gov	Free
Modis	2003-Present	250M, 500M, 1km, 5Km	https://search.earthdata.nasa.gov	Free
ESA	1992-2018	300M	ftp://geo10.elie.ucl.ac.be/v207/	Free

Mapping Land Cover Change

What ***ESCAP-SD*** will do tomorrow (and beyond)!

1. Make your 1st land cover change map **(expected release in August 2020)**
2. Automate your map production **(expected release in August 2020)**
3. Map community flood hazard exposure **(expected release in September 2020)**
4. Expose the Urban Hot Spots **(expected release in September 2020)**



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Thank You

for listening

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