

Scope of the project

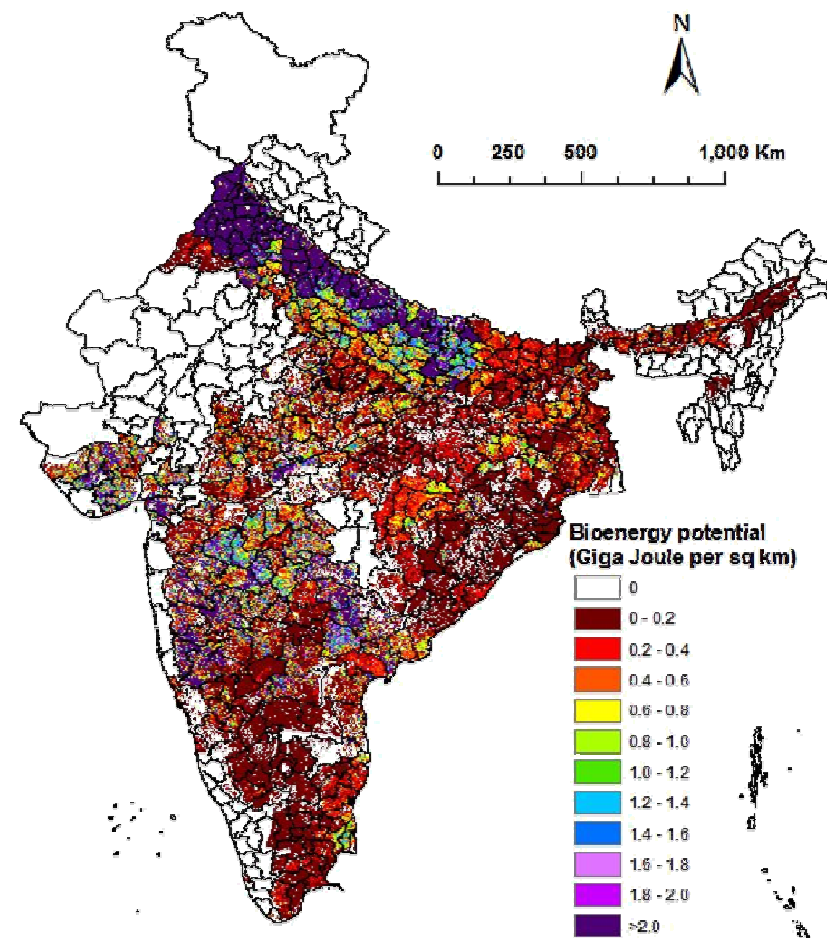
- Technology demonstration to assess biomass availability from crop residues
- Useful for officials/policymakers of concerned departments and industry developers to assess the availability of crop residues over a defined area
- Helps in identifying prospective zone for setting up industries of biomass/biofuel plants
- Provides amount and type of crop residues (rice wheat, cotton and sugarcane) over an area, which will help in tailor-made biofuel plants
- Provides geospatial information on wasteland/water bodies/fallow for industry use
- Provides major road network, railways and petrol pump location to support logistics



भुवन जैवऊर्जा



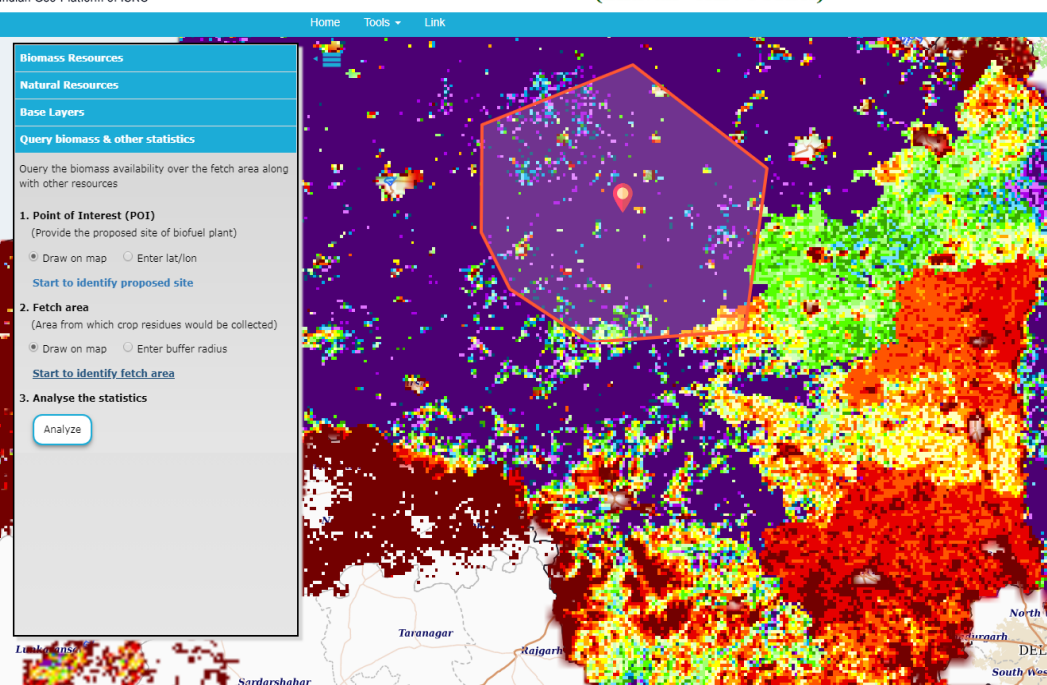
Spatial Information System of Biomass Potential from Crop Residues (Rice, Wheat, Cotton and Sugarcane)



**Geospatial technology intervention for utilization of crop residues
(Planning and establishment of biomass/biofuel plants)**



Spatial Information System of Biomass Potential from Crop Residues (Bhuvan - JAIVOORJA)



Data used in the study

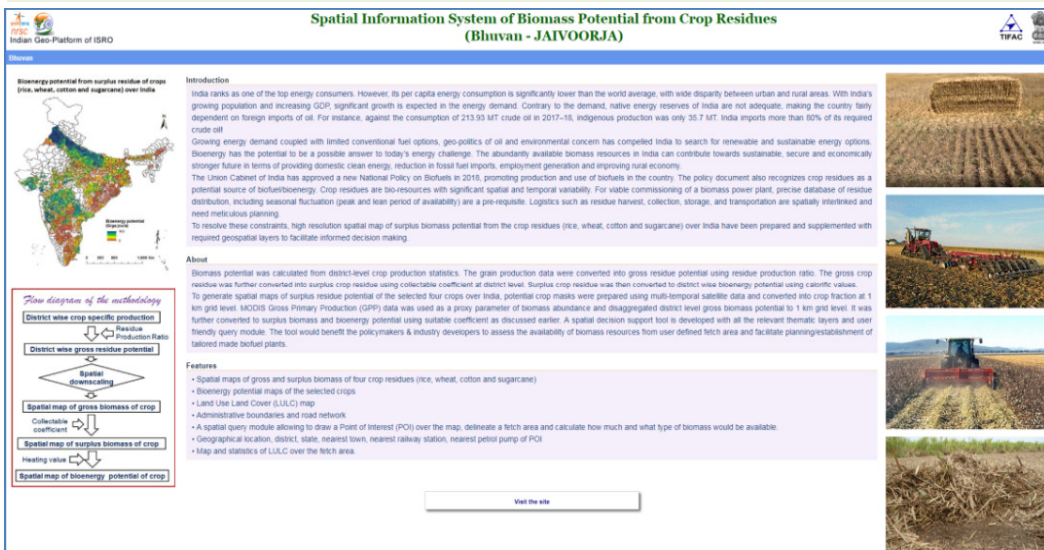
- The district-level crop production statistics pertaining to 2010-2016 were used to calculate district-level biomass potential for the selected four crops by IARI
- Potential crop maps were prepared using multi-temporal satellite data of 2013-16
- Crop maps were generated over the major crop-growing districts of India
- Biomass was converted to bioenergy using recommended calorific value

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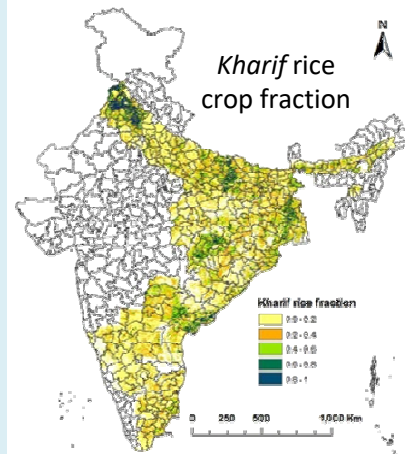
Project background

- Native energy reserves are not adequate to support its high GDP growth, hence India is fairly dependent on foreign imports of oil and natural gas
- Biomass-based energy could be a possible answer to today's energy challenge
- National Policy on Biofuels (2018) recognized crop residues as a potential source of biofuel/bioenergy and promotes its enhanced utilization.
- The significant variability of crop residues across space and time necessitates meticulous planning of residue harvest, collection, storage, and transportation for successful commissioning of biofuel plants
- To resolve these constraints, National Remote Sensing Centre, ISRO in collaboration with TIFAC, DST, has developed a Spatial Information System - **BHUVAN JAIVOORJA** - to assess the biomass availability, land use and logistics based on user-defined point of interest and fetch area towards informed decision making



Methodology and Techniques

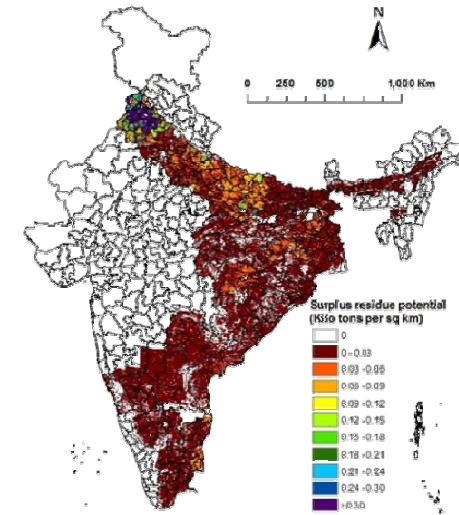
- District-level crop production statistics to assess the gross/surplus biomass from crop residues
- Multi-temporal satellite data for crop mapping (AWiFS, LANDSAT OLI, RADARSAT-2)
- MODIS Gross Primary Production (GPP) as a proxy of crop biomass and its spatial variability
- Spatial downscaling of district-level data to 1 km grid level using remotely-sensed proxies
- BHUVAN JAIVOORJA** - A geospatial tool for online visualization and user-defined query system to assess biomass resources, land use and logistics for planning and sustaining plants



Uniqueness of the product

- For the first time, spatial maps of gross and surplus biomass potential of selected crop residues are made available
- Bioenergy potential maps the crops
- Land Use Land Cover (LULC) map
- Major rivers and surface water bodies
- Administrative boundaries, road network
- BHUVAN geo-portal for online visualization, annotation, delineation
- Spatial query module to draw a Point of Interest (POI) over the map, delineate a fetch area and calculate amount and type of biomass available from the area
- Report providing geographical location, district, state, nearest town/railway station/petrol pump along with map and statistics of LULC over the fetch area

Geospatial map of surplus biomass of kharif rice crop over India



Land Use and Land Cover Map of India

