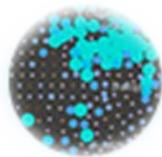# GIS and Remote-Sensing Data Facility, EMAD

A geographic information system (GIS) is a framework for gathering, managing, and analysing data. Rooted in the science of geography, GIS integrates many types of data. It analyses spatial location and organizes layers of information into visualizations using maps and 3D scenes. With this unique capability, GIS reveals deeper insights into data, such as patterns, relationships, and situations—helping users make smarter decisions. The central tenets of a GIS facility are to:
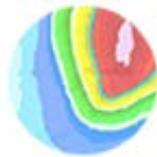
Identify Problems	*Monitor Change*
Manage & Respond to events	*Perform forecasting*
Set priorities	*Understand trends*

EMAD has the facilities for/capability of carrying out

1. PostGIS/PostgreSQL Database integrated with Dual-Xeon processor-SSD servers for efficient GIS Mapping solutions, shapefile rendering online (through LAN).
2. OSM database for road, rail, places/villages, facilities.
3. Use of remote sensing and semi-automatic classification of satellite imagery for Land Use & Land Cover identification of an area.
4. Geo-referencing and digitisation of analogue maps into high-quality digital map reproducible in different formats e.g. SHP, KML, LYR, JPEG, PDF etc.
5. Advance mapping solutions on GIS platforms.

Services Offered

1. Outline Map of places of studies or areas around NPP/DAE/BARC facilities up to tehsil/taluk level.
2. Detailed/layered map of a place of study including rails, road, water-bodies and elevation contour.
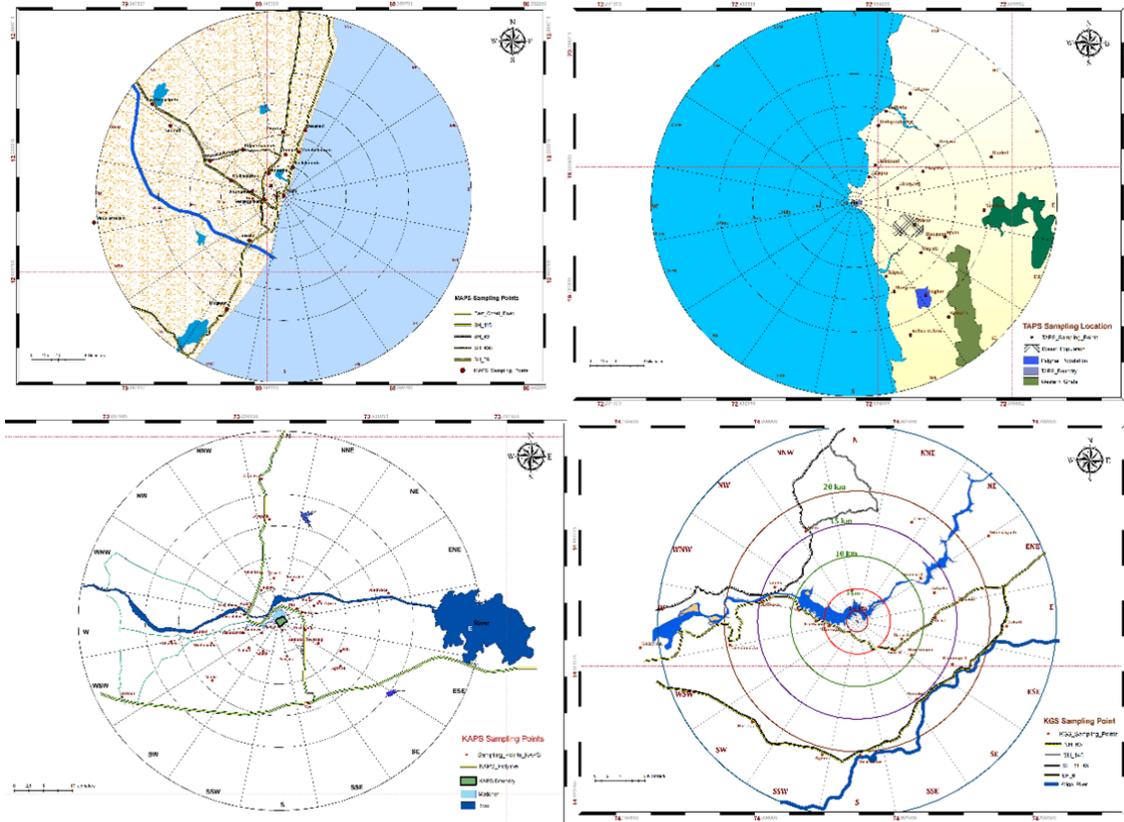3. Tagging of GPS locations

Figure 1: 30 km sectoral map with topography for sampling strategy around NPP Sites

4. LULC (Land-use and Land-cover) determination from satellite imagery
5. Digital Elevation Models (DEM) analysis at 30 m & 90 m resolution
6. Heatmap (continuous distribution pattern) for discrete parameters e.g. Population Distribution, Heavy metals, Uranium etc.
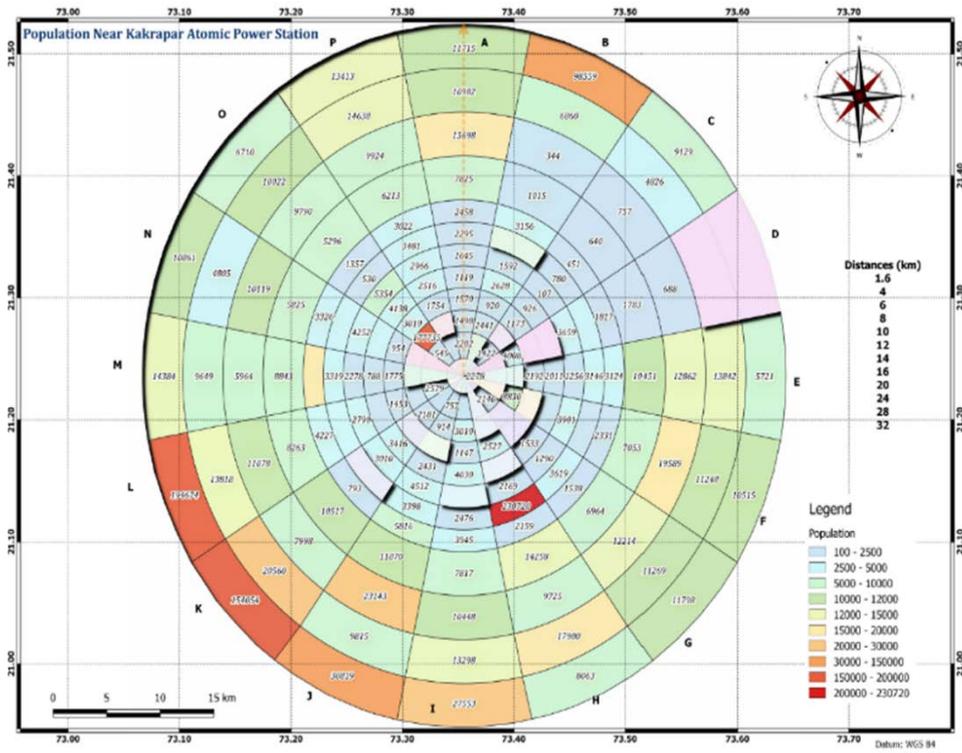
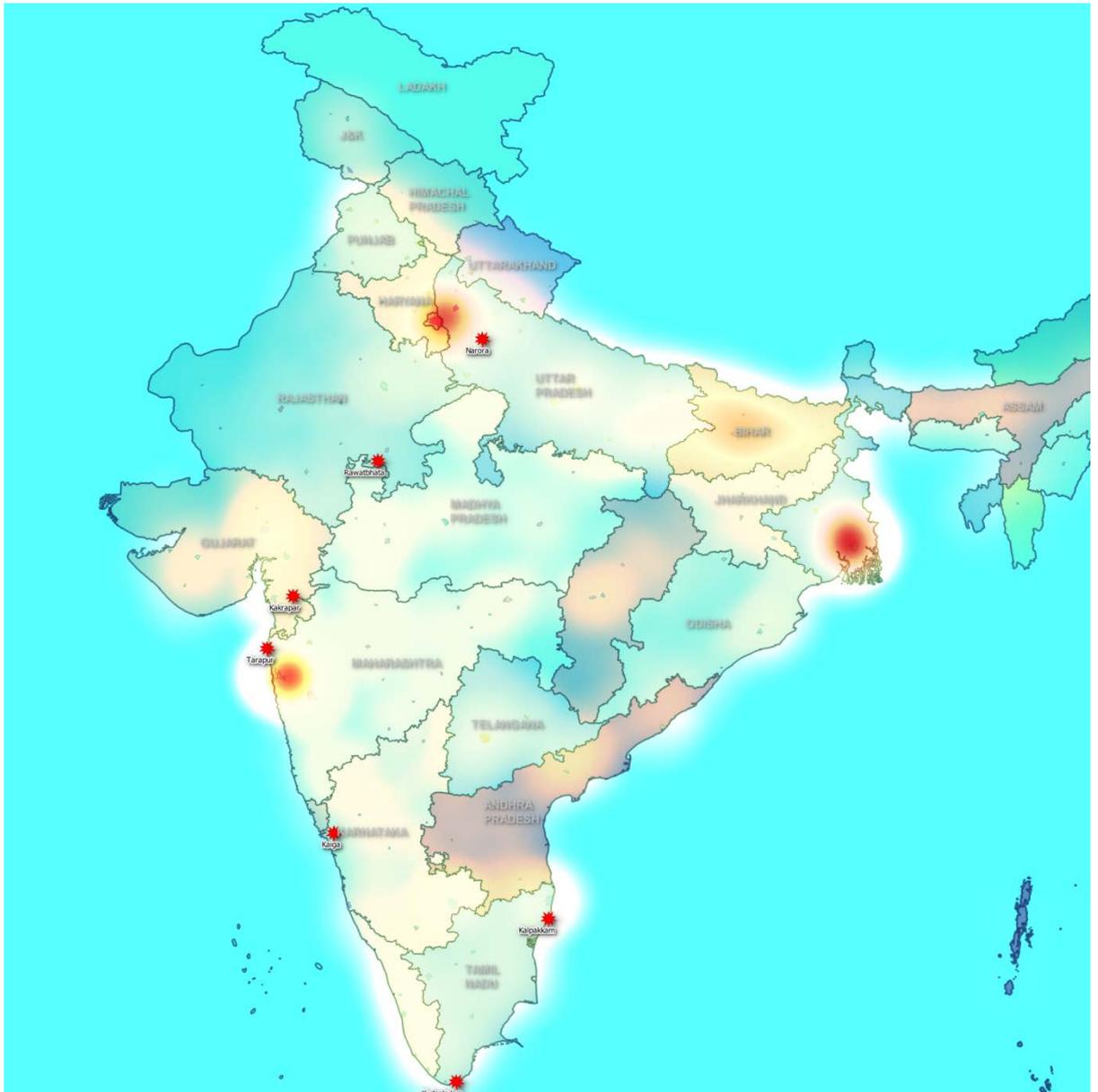*Figure 2: Population distribution around KAPS (Kakrapar, Gujarat) NPP*

Figure 3: Heatmap for population distribution of India wrt NPPs