

Integrated Data Management System for Real-Time Environmental and Social Monitoring of Hydropower Projects

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Integrated data management system to monitor and assess environmental and social mitigation measures for hydropower projects

Data collection

Data management

Data analysis

Information dissemination

WebGIS and Web Map Services (WMS) protocols:

- Real-time data collection, storage, and online visualization
- Monitoring of environmental and social conditions
- Evaluation of ecosystem resilience in response to project activities

Tanahu Hydropower Project (THP)

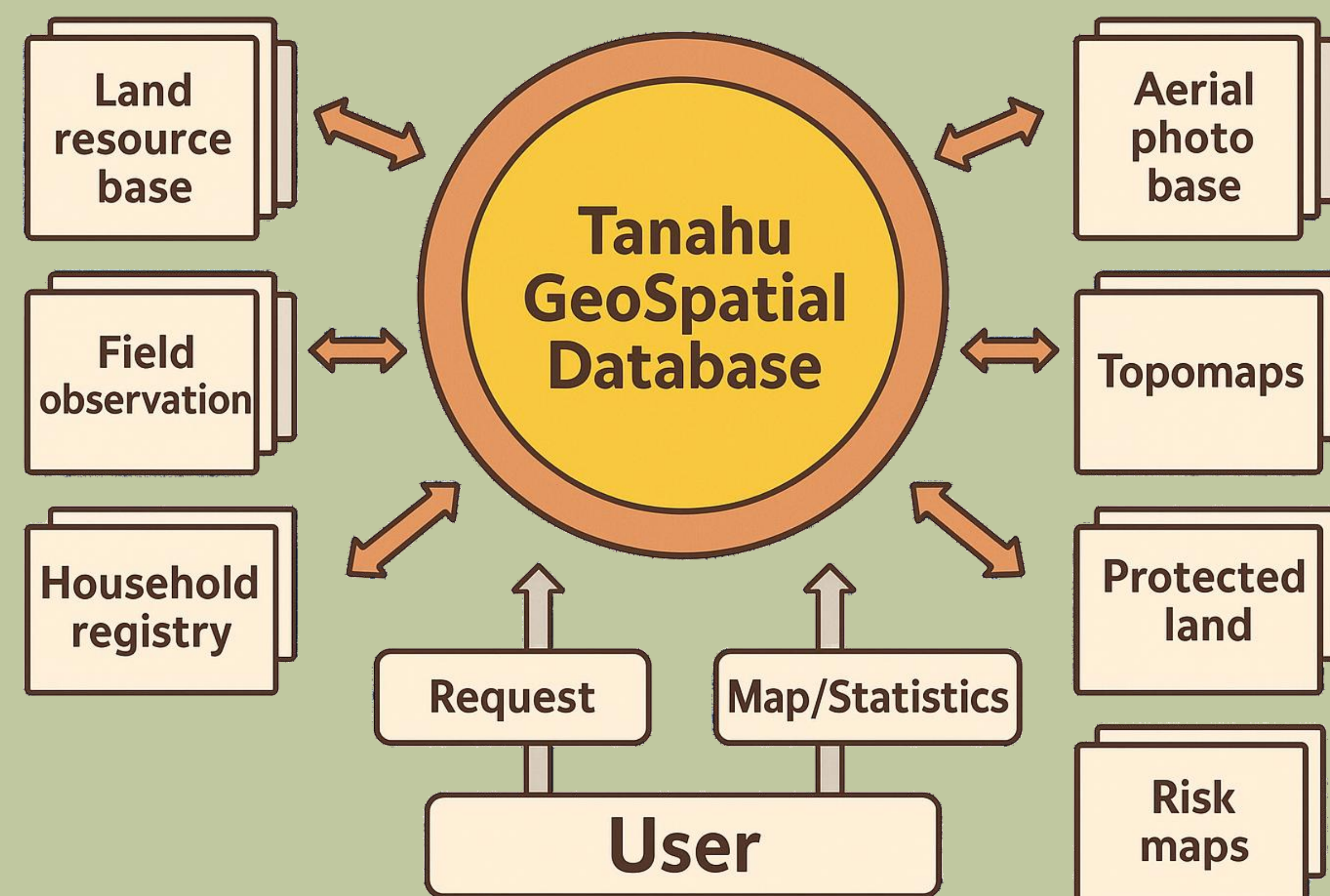
140 MW storage-type facility on the Seti River (Nepal)



Generic Data Management Model (GDMM) for the THP

The geodatabase model represents an advanced approach to spatial data management.

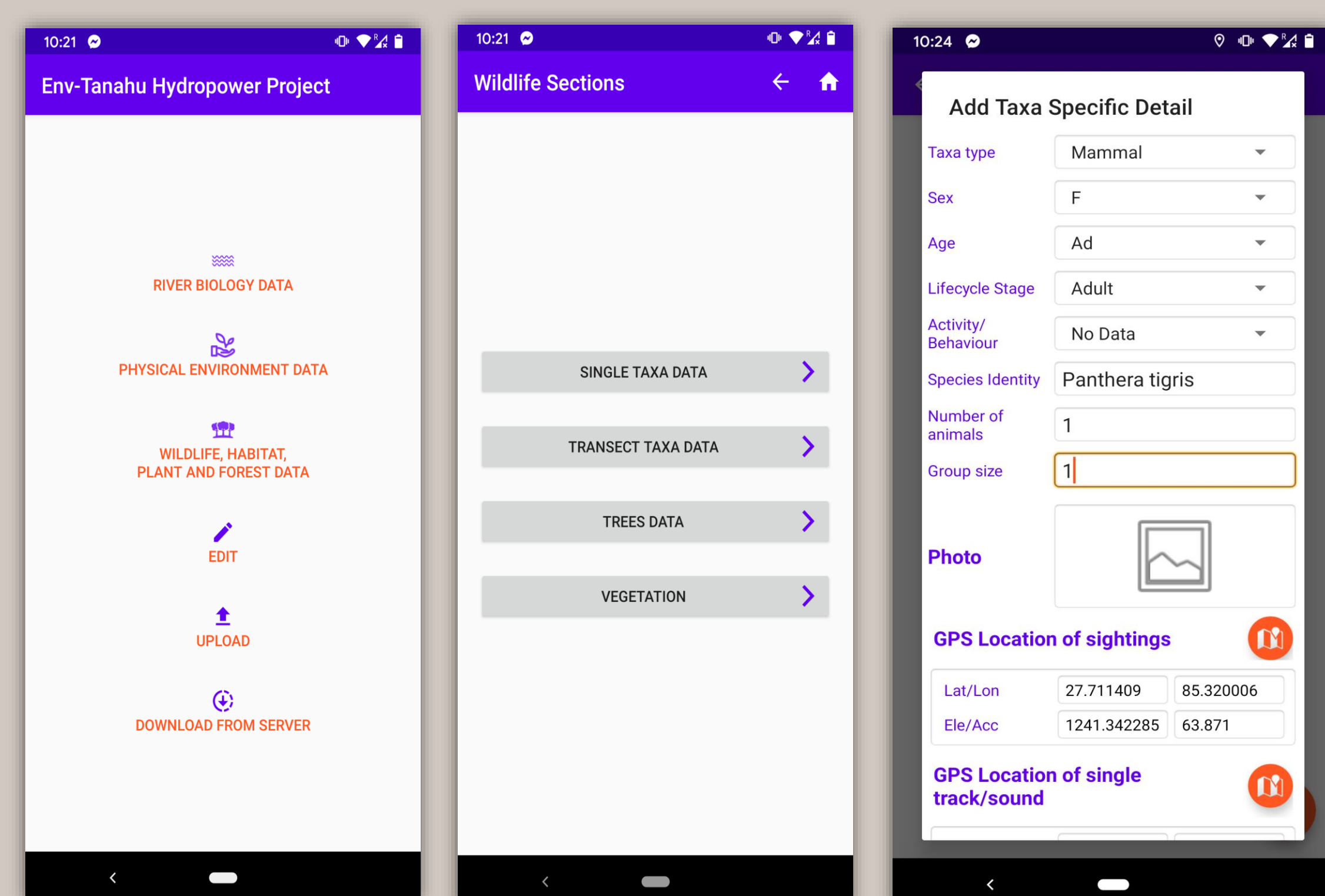
Allows for the definition of relationships among features and enhances the efficiency of geographic data organization, analysis, and visualization.



- **Centralized Repository**
- **Enhanced Data Accuracy:** validation rules to support precise data entry and editing
- **Relational Features:** interconnected
- **Intelligent Mapping:** improved cartographic outputs

- **Dynamic Visualization:** interactive map
- **Flexible Geometry Management:** capability to define complex feature geometries
- **Seamless Data Continuity:** large datasets
- **Multi-user Editing**

Data Collection via Smartphone applications



River Biology and Fisheries Data

Physical Environment Data

Wildlife, Habitat, Plant and Forest Structure Data

Social Data

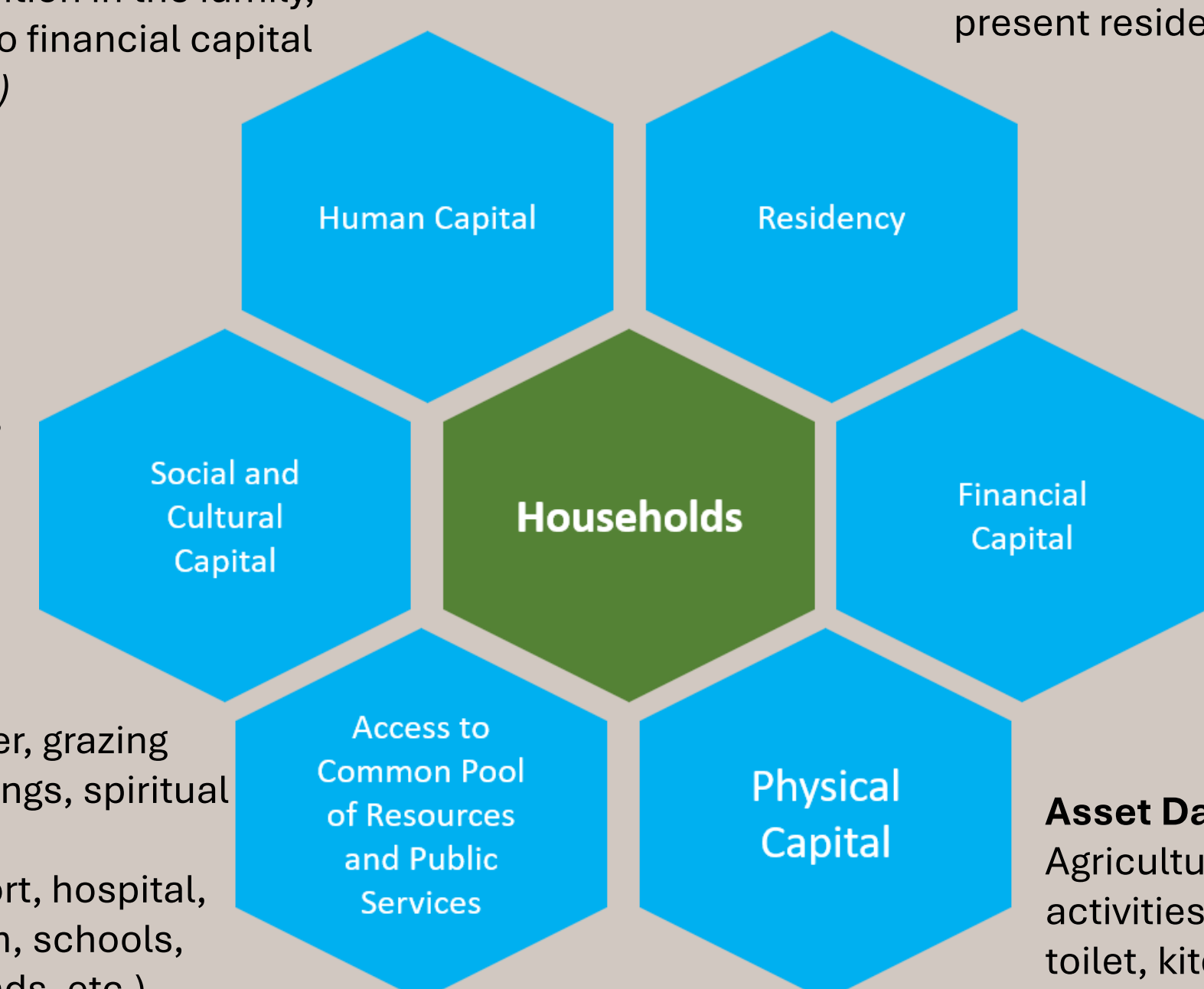
Households and Family Members Data

Name, education, profession, caste, ethnicity, disability, health status, position in the family, member in/out, etc. linked to financial capital (Pre- and post-resettlement)

Georeferenced Data + Administrative Boundaries
Pre-resettlement residency, present residency

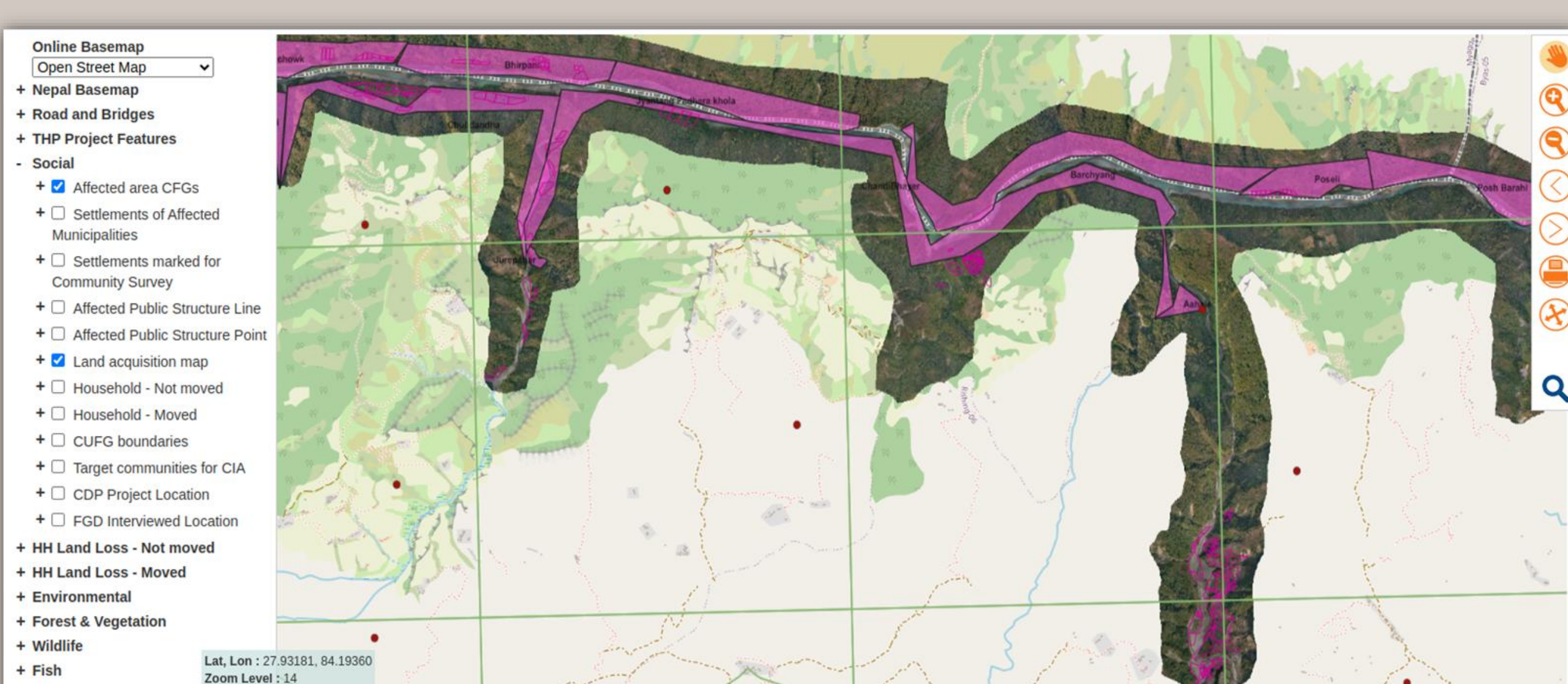
Membership, labor & business association, women & group, cultural traditions and related community practice (Pre- and post-resettlement)

Community places, river, grazing land, forest, paths, springs, spiritual sites, etc.
Public services transport, hospital, clinic, sewerage system, schools, structures (bridges, roads, etc.) linked to income, social capital, human capital (in terms of users)



Income Data
Agriculture, livestock, fisheries, job, remittance, business, etc. linked to human capital, physical capital, social capital, access to common pool of resources (Pre- and post-resettlement)

Asset Data
Agricultural land tools for land-based activities, vehicles, structures, water, toilet, kitchen, livestock, etc. linked to income (Pre- and post-resettlement)



Interactive WebGIS Maps and Real-time Monitoring

