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**Kathmandu, Nepal 14–16 November**

**REGIONAL CONFERENCE 2024**

*Climate Responsive Land Governance and Disaster Resilience: Safeguarding Land Rights*



**Modern Approaches of Frequent Land Demarcation of Highly Flood Prone Zone of Koshi River Basin.**

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**Presented By:**

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## Background:

### •Importance of land demarcation in resource management.

- Land demarcation is the process of defining and marking the boundaries of a piece of land.
- Land demarcation clarifies ownership, facilitates management, supports legal framework, enhances productivity, mitigates flood risk and promotes community resilience.
- The Koshi river face severe challenges due to frequent flooding, impacting land boundaries and community resilience.

### •Challenges in flood-prone areas.

- Frequent flooding and Land degradation
- Inadequate land demarcation.



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## Importance of Land Demarcation

### •Significance:

- Ensures ownership rights and facilitates land management.
- Land demarcation resolves conflict, promotes sustainable practice of riverbed farming enhancing agricultural productivity.



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## Impact of Flooding

### •Flood Frequency:

•Statistics on flooding events in the region.

- The Koshi River in Nepal has experienced severe floods, notably in 1984 and 2008. The 2008 flood, caused by an embankment breach, displaced over 3 million people, damaged 95,000 hectares of land, and cost over \$1 billion. (Source: *Koshi floods in Sunsari and Saptari / OCHA Appeal and Situation Report 14 November 2008*)

### •Consequences:

- Boundaries erosion of agricultural and resident Zones.

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## Challenges in Traditional Demarcation

### Limitations:

- Outdated cadastral maps. (2027 B.S.)
- Legal complexities in land ownership.
- Financial constraints for high-precision instruments.



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## Objective

- Explore modern methods for effective land demarcation.
- Systematic demarcation of agricultural and residential parcels, which are flooded frequently with in a certain span of time.



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## Geographical Context and Demographics

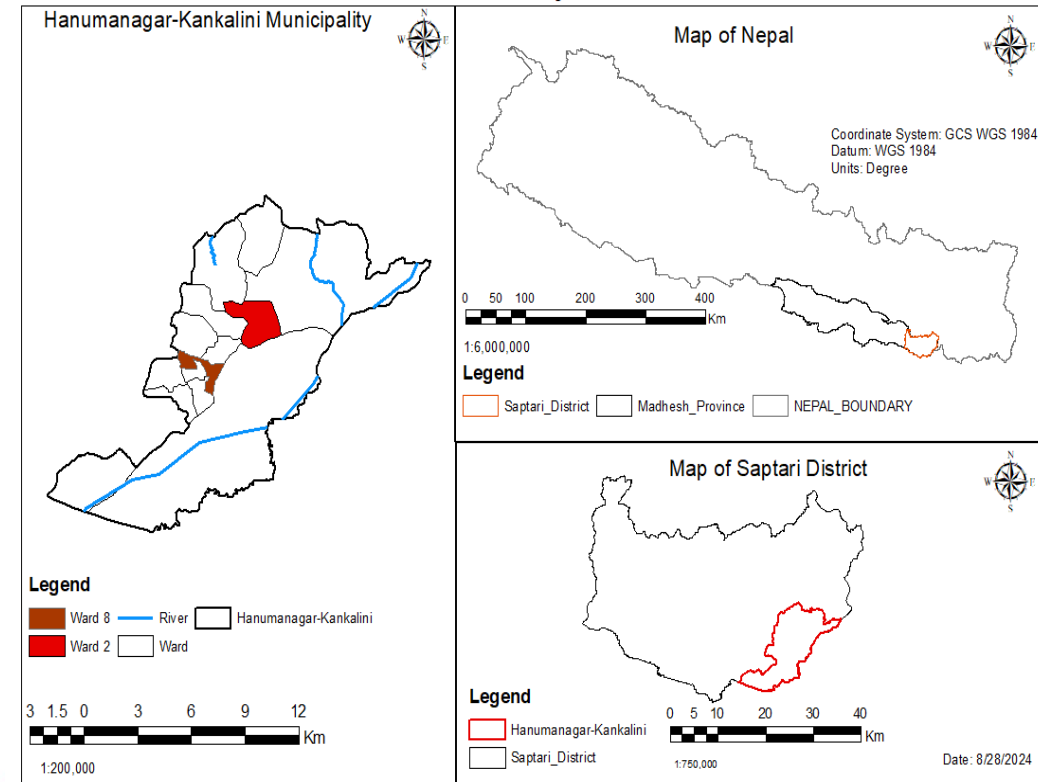
### •Location of the Koshi River Basins.

- The study area of our project is ward no. 2 & 8 of Hanuman-nagar kankalini municipality Which is in Saptari district of Madhesh province.

### •Population and land use patterns in the region.

- The Koshi River basin have a dense, vulnerable, population reliant on agriculture, facing flood and land use conflicts.

### Study Area





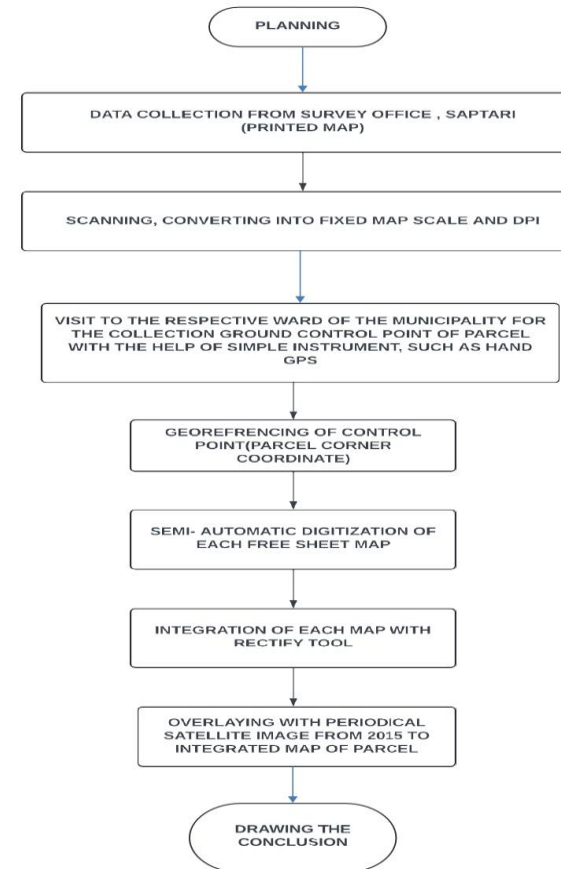
## Methodology Overview

### •Data Sources:

- Satellite images from Google Earth.
- Cadastral maps from the Survey Office Saptari

### •Field Data Collection:

- Ground control points using handheld GPS.







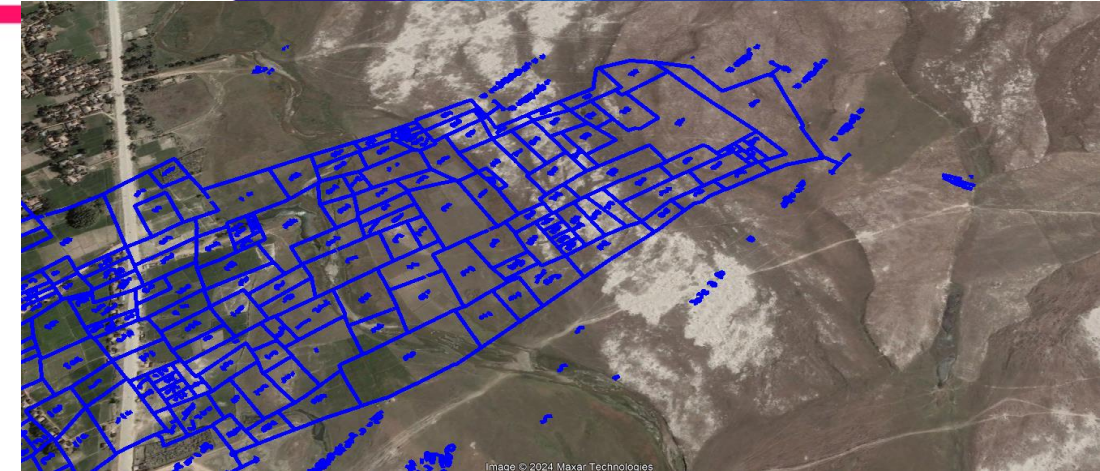
## Data Analysis Techniques

- **Satellite Image Analysis:**

- Periodical analysis of flooded parcel maps.

- **Cadastral Map Evaluation:**

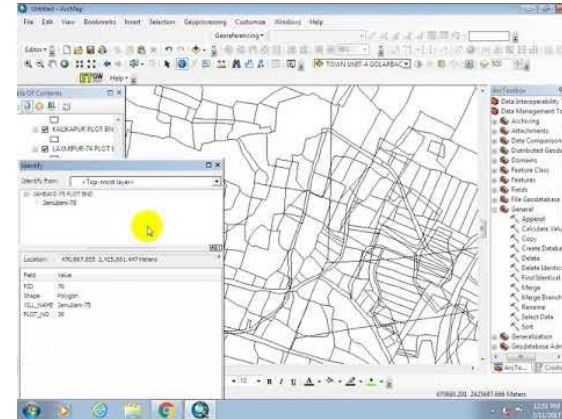
- Assessing the impact of floods on property borders.





## Proposed Solutions

- **Modernizing Cadastral Maps:**
  - Each Free-sheet map should be converted into Trig-Sheet.
- **Demarcation of the Parcel by GNSS Equipment's.**
  - Frequent land parcel demarcation is only possible using high precision GNSS Equipment by making efficient and effective Local level land use department.
- **Stakeholder Engagement:**
  - Collaboration with local government and communities.





## Coordinate-Based Mapping

### •Methodology:

- Use of GNSS instruments for precise demarcation.
- Coordinate based mapping involves data collection, establishing ground control points, geo-referencing, parcel identification, stakeholder engagement, and documentation to ensure accurate land demarcation.

### •Benefits:

- Accurate identification of parcel boundaries.
- Coordinate based mapping improves accuracy, enhances land management, reduce disputes, and promotes sustainable land practice in flood prone areas





## Sustainable Livelihoods



### •Promoting Riverbed Farming:

- Seasonal farming practices for marginalized populations.
- Distribution of lands to the landless ensuring their tenure security till another flood in this region.

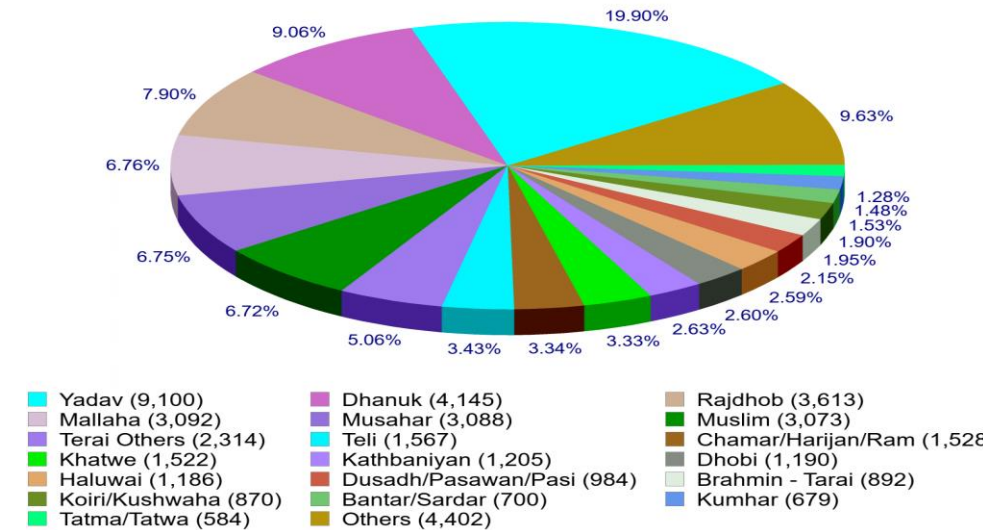
### •Economic Impact:

- Enhancing local incomes through sustainable practices.

Hanumannagar Kankalini Municipality, Saptari District  
Population by Caste (2011 Census)

Copyright © 2020 NepalArchives.Com | Data Source: CBS, Nepal

Note: 'Others' represents the Castes with less than 1% of total population





## Community Resilience

### •Adaptation Strategies:

- Floodplain zoning and resilient agricultural practices.
- Effective land use planning considering the climate resilient agricultural economy.

### •Empowerment:

- Supporting communities in making informed land use decisions.
- Promoting the land bank concept at the local level, so that there will be easy in distribution of it. For example – Riverbed Farming.





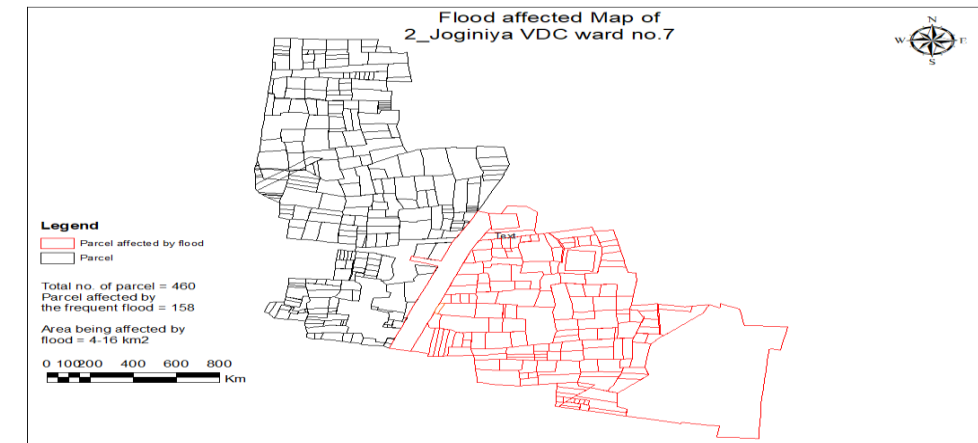
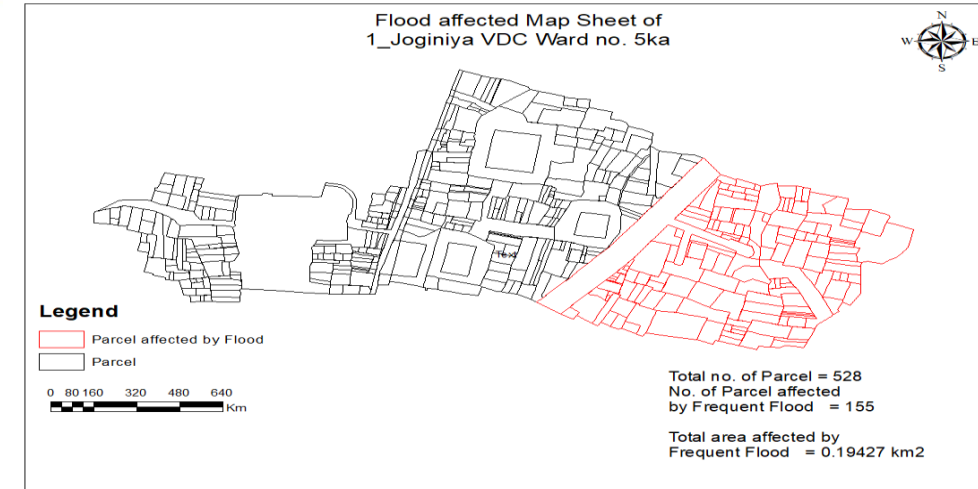
## Key Findings

### ➤ Parcel Impact:

- Number of parcels affected by flooding.
- Areas most vulnerable to flood damage.

### ➤ Recommendations:

- Need for updated land management strategies.
- Spatial database for every parcel having their corner parcel coordinates at local level.
- Upliftment of the capacity Local level land use department through technical resources, ensuring the rights by the Constitution and human manpower.





## Conclusion

### ➤ Summary:

- Importance of modernizing land demarcation techniques.
- Collaboration among stakeholders is crucial for effective management.

### ➤ Future Research:

- Further studies on sustainable land use practices.
- Large scale research should be done as soon as possible.
- Koshi-River program and INGO's & NGOs should emphasize on sustainable agricultural & animal husbandry practices.



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## Thank You!



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