

Socio-economic: Research status and future prospects

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Golam Rasul, Theme Leader, Livelihoods

International Centre for Integrated Mountain Development

Kathmandu, Nepal

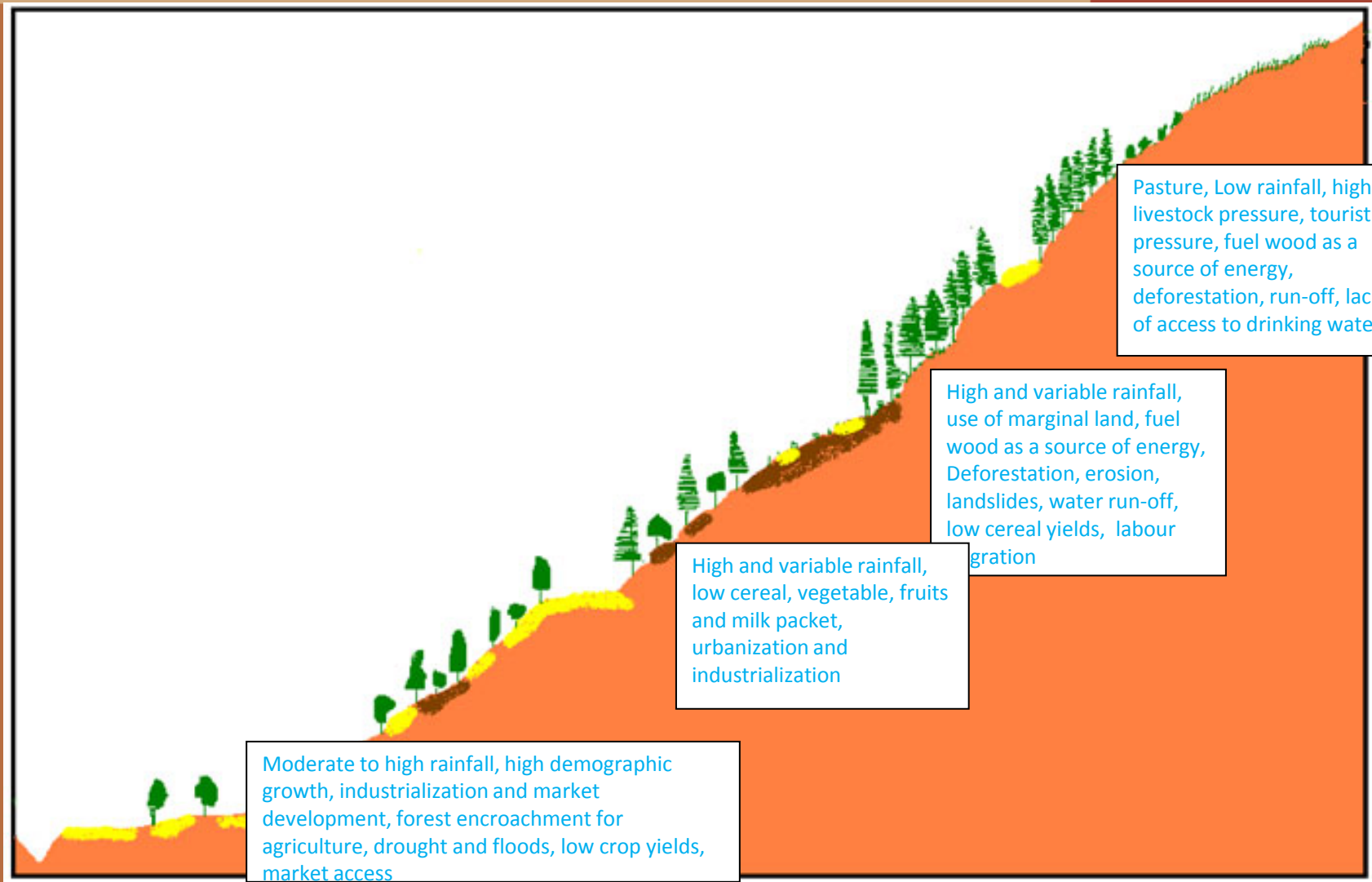
FOR MOUNTAINS AND PEOPLE

- **Background**
- **Key issues**
- **Research Priority**
- **Research Progress**
- **Future roadmap**
- **Role of cooperation**

Water, Economy & Livelihoods

- Water for livelihoods- Central to livelihoods
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- Water for Food: Irrigation, livestock, fisheries
- Water for Energy
- Water for Economy

Socio-economic features & bio-physical characteristics

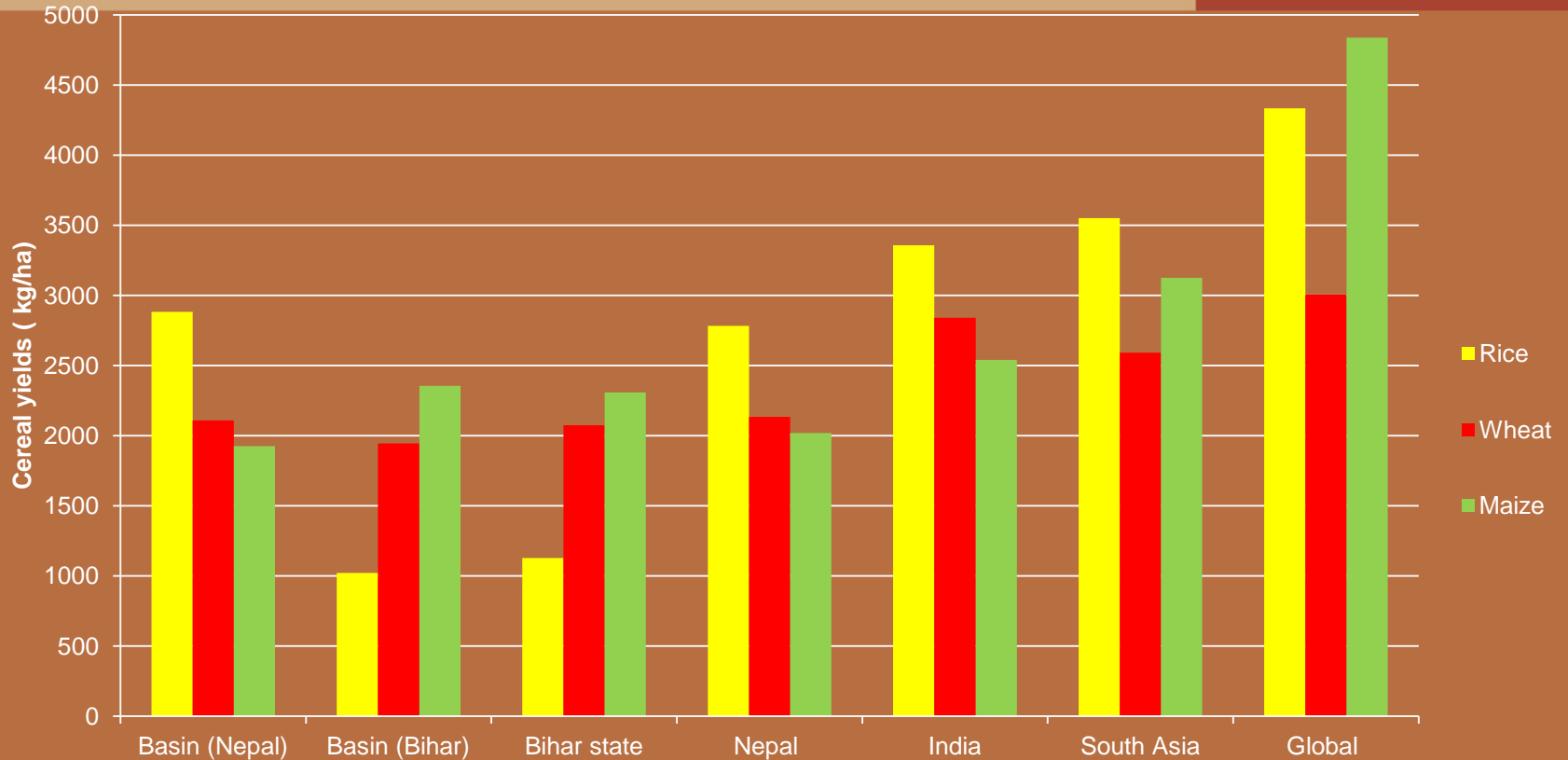


<100m ← → >8000m

Key issues

- **Water insecurity-Low irrigation coverage**
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- **Food insecurity- low crop yield**
- **High outmigration- Women headed households**
- **Energy insecurity**
- **High Poverty**

Low crop yield at Koshi



-Rice, wheat and maize are grown in more than 85 % of cropped area at basin

-Poor rice and maize yield

Low irrigation coverage

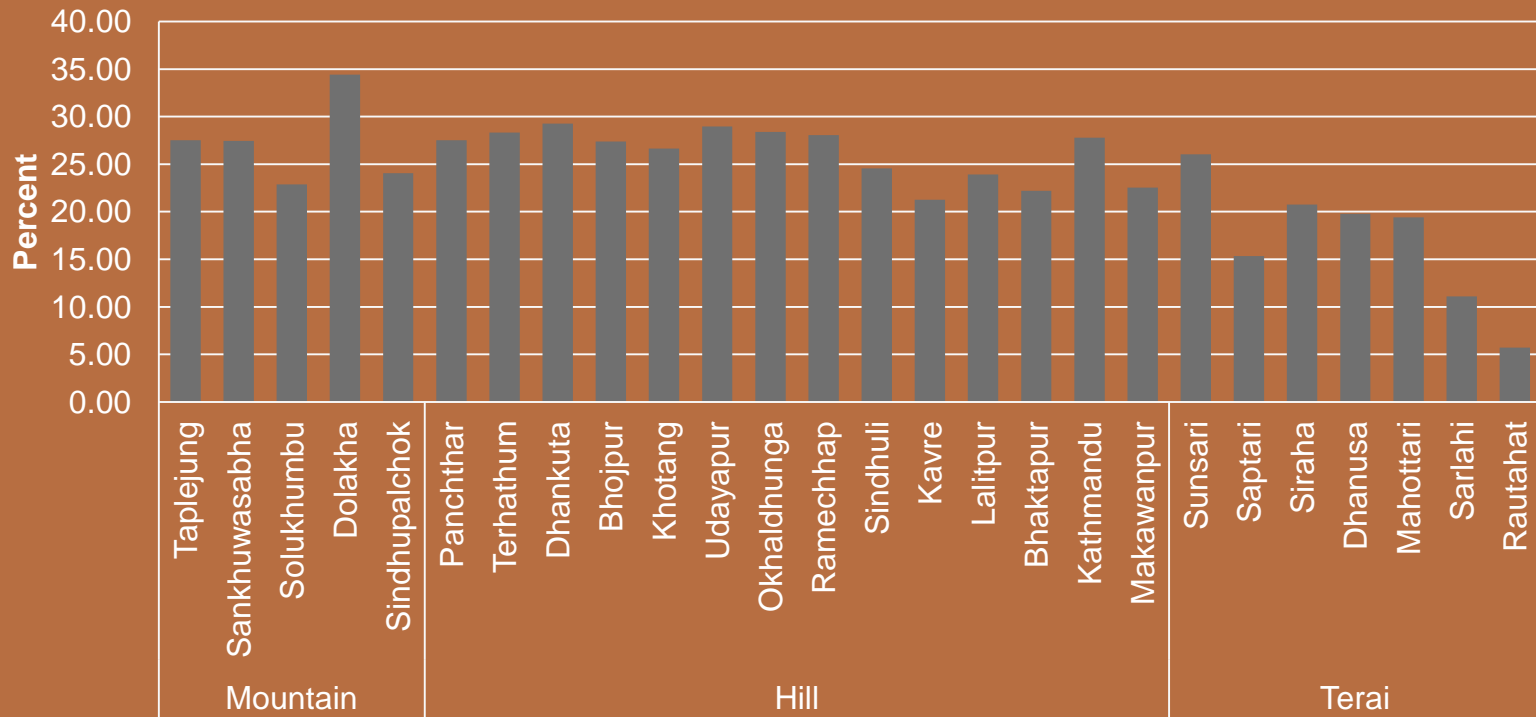
- Out of 27 districts, **15 districts have less than 15 % irrigation coverage**
- Bihar only 30 % irrigation coverage
- National figure of irrigation coverage is 47.2% for Nepal & 39.1 % for India
- Lower irrigation efficiency (only 36% in Bihar)

Higher livestock pressure

- Koshi basin consist >23 million livestock : 9 million in Nepal and 15 million Bihar.
- High livestock pressure is found in the districts which have higher forest cover & higher rainfall occurrences
- It varies from 14 livestock unit/hh in Terathum (Mountain of Nepal) to 1 livestock unit/hh in East Champaran (Bihar part).
- Less productive, compost purpose, social prestige in mountain
- Creating pressure in the forest & pasture resources

Gender issues at Koshi

Figure: District-wise women headed households at Nepal part of Koshi



Women headed hhs varies from 6 percent (Sarlahi) to 35 percent in Dolakha

What are the driving forces for the women headed hhs and its implication on livelihoods strategies and water resource management at Koshi needs to be analyzed?

Poverty incidence

- High poverty
- Districts with > 50 percent poverty incidence

Nepal	Bihar (India)
Sindhuli, Udaipur, Taplejung, Panchthar, Bhojpur, Khotang	Darbhanga, Begusarai, Muzzafapur
24.3 % (national figure)	32.7% (national figure)

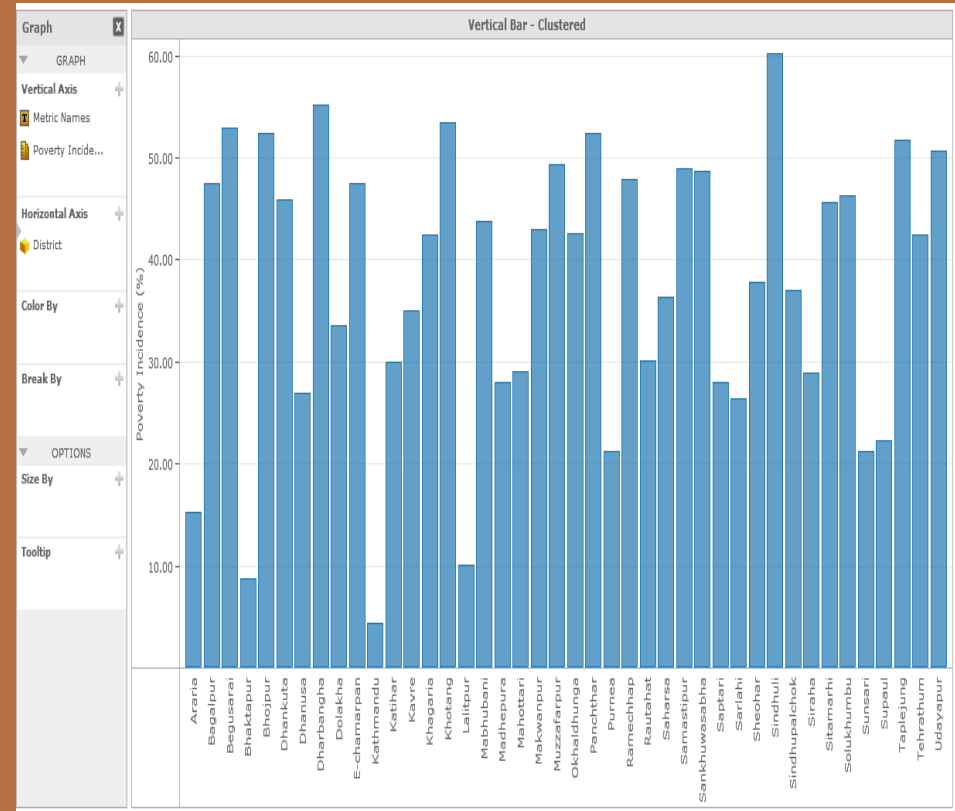


Figure: poverty incidence at Koshi districts of Nepal and Bihar

Energy security

- Only 5 % households have access to electricity in mountain & hills districts of Koshi basin
- 20 % households in most of the districts of Koshi at Bihar part have access to electricity
- Per capita electricity consumption for Bihar is the lowest in India (122 KWH where as the national average is 779 KWH)
- Firewood is the main source of energy for cooking at Koshi; > 90 % households of the mountains & hills districts of Koshi (Nepal part) depend only on firewood for cooking.



Poverty incidence, electricity access, use of firewood and access to drinking water



- Higher the firewood use, higher the poverty
- Higher the drinking water access, lower the poverty
- Lower the electricity access, higher the poverty

Key research questions

- Why poverty and food insecurity issues are more at basin than non-basin?
- Why crop/livestock productivity is lower at Koshi basin?
- Fruit & vegetable performance at Koshi looks promising at Koshi but why it is cultivated only in a small area?
- Why women headed households are increasing at Koshi?
- What is the implication of agriculture feminization on future livelihoods and water resource management?

Key research questions

- Koshi is the home of dalit, marginal people & scheduled castes. How those people can be uplifted?
- Koshi carries huge potentiality of hydro-power, tourism and fisheries but why those sectors are underexploited and how it can be exploited for the economic development of the basin people?
- What is the current institutional landscape at Koshi & what is the gap?
- How the gap can be filled to address the livelihood issues and better water management at Koshi?

- **Understanding** Water, Livelihoods & Socio-economic Issues
- **Exploring** development potentials, options, strategies for livelihoods promotion and Adaptation
- **Developing/suggesting** mechanisms for transboundary cooperation for integrated water resource development
- **Strengthening** network and partnership to facilitate collaboration
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- Socio-economic profile of Koshi is prepared
- Gender profile & gender related issues are identified
- Analyzing water & livelihood issues: agriculture, livestock
- Measuring water productivity in Koshi basin
- Review of water & climate change related policy of the basin countries
- Valuation of Ecosystem Services- Koshi Tappu Wetland
- Integrated bio-physical and socio-economic model for Adaptation to Climate Change for Agriculture & Water

- Exploring water-based development potentials
- Analysis of alternate /multiple uses of water
hydro-power development,
Fisheries,
Tourism
Navigation
- Livelihoods Adaptation options-
- Integrated modeling

Koshi Roadmap for Future

- Baseline report
- Identification of vulnerable sub-basins
- Basin wide gender situation analysis framework
- Multi-dimensional poverty analysis (14 districts of Nepal part)
- Framework of water productivity

- Water productivity assessment
- Water , food security, livelihood issues
- Alternative uses of water (hydro-power, fisheries, tourism...)
- Adaptation practices
- Integrated farming in drought & flood prone area

- Exploring development options/ pathways
- Options for livelihoods promotions & Adaptation
- Identification transboundary issues
- Networking, sharing
- Facilitating cross-country sharing

- Develop/suggest mechanisms for transboundary collaboration for livelihoods promotion and better Adaption
- Improved livelihoods and better adaptation

2012/13

2013/14

2014/15

2015/16



- Ecological, environmental & economic inter-linkages
- Floods generated in Nepal affect Bihar in India;
- Glacial lake outburst floods in China can affect hydropower stations in Nepal;
- Erosion in one country deposits sediment in another country;
- Hydropower potential lies in one country, its market lies in another country.
- These interdependencies necessitate collaborative development of water resources in Koshi

Thank You

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THREE DECADES
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Analysis of alternate /multiple uses of water (water for hydro-power development, fisheries, tourism/navigation)

Improvement in Irrigation efficiency (lining canal, switching from canal to sprinkler irrigation.....)

Switching from water intensive cereal to high value crop (increase water productivity)
Integrated farming (ICAR proposal)

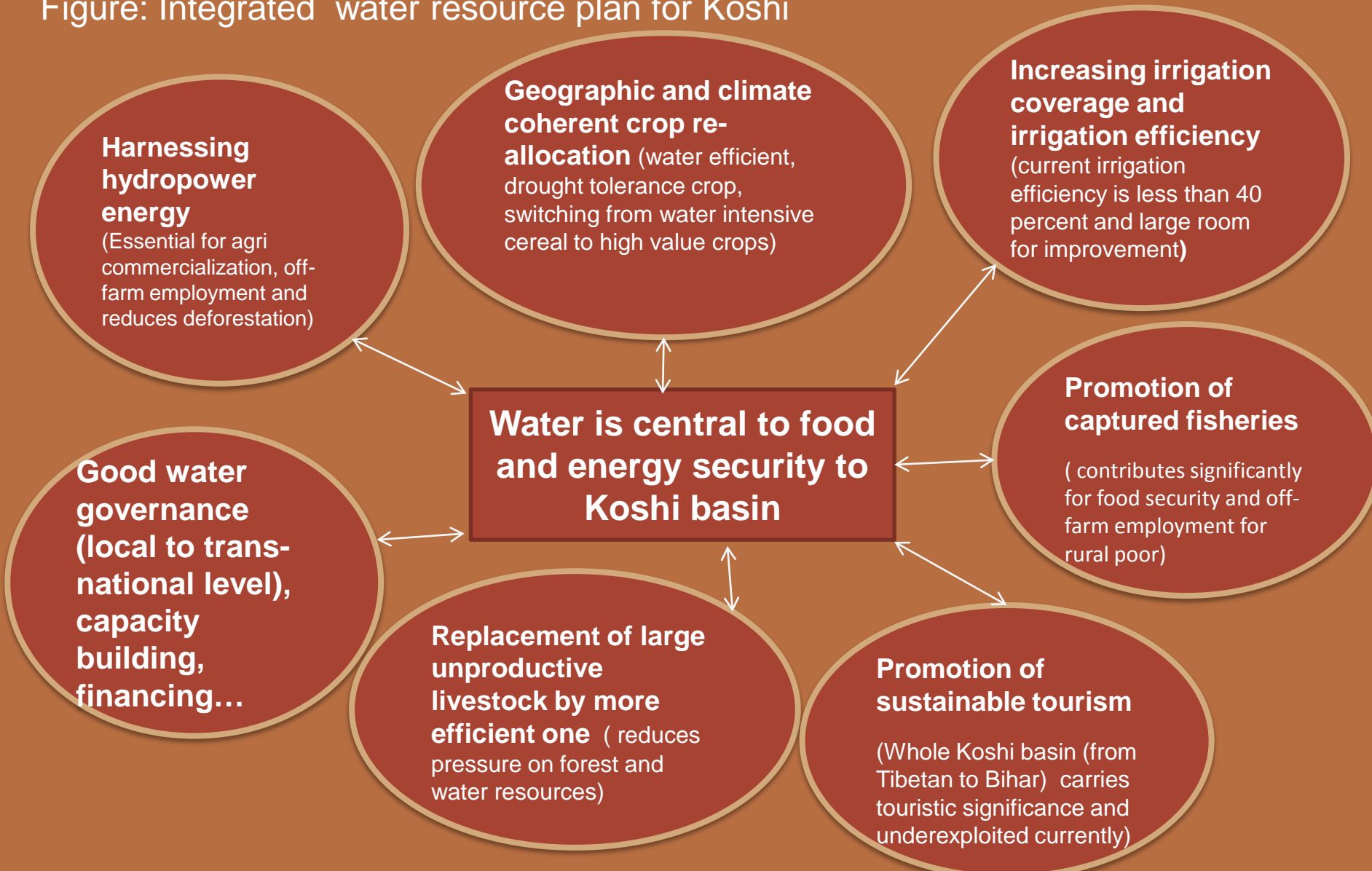
Suitable crop options plus optimal livestock size for a specific location rather than widely practiced rice-based farming system

Identification and multiplication of the best practices in the coherent geographical zone with similar socio-economic characteristics

Location specific policy analysis and recommendation is required rather than blanket policy as a whole due to geographical and socio-economic variation within basin (mountain districts have run-off problems, some plain areas have flood/water logging, siltation problems while the others have drought)

Non-agricultural growth/off-farm employment

Figure: Integrated water resource plan for Koshi



Koshi Roadmap for Future

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Research challenges

- Administrative (socio-economic) and geographical unit (bio-physical)
- Multi-level, multi-perspective problem
 - Scale issues (spatial and temporal)
 - Data gaps
 - Need triangulation with qualitative findings and supplemented by case studies
- Socio-economic diversity with variation in gradient (30m to above 8,000 m) and application of same tool may gives absurd result