Climate change, Water Conflicts and the Planning Challenge:

Insights from two local government areas in the Nepal Himalayas

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OUTLINE

- Water governance context
- Research framework
- Climate change and water insecurity: two case studies
- Conflicts
- Water management responses
- Locally engaged research
- Preliminary conclusions

KEY QUESTIONS

- ❑ How climate change is impacting water security ?
- ❑ How local politics, and changing community livelihoods are interacting to intensify conflicts over water supply management in settlements that are rapidly changing from rural to semi urban ?
- ❑ How locally engaged research can understand and help?

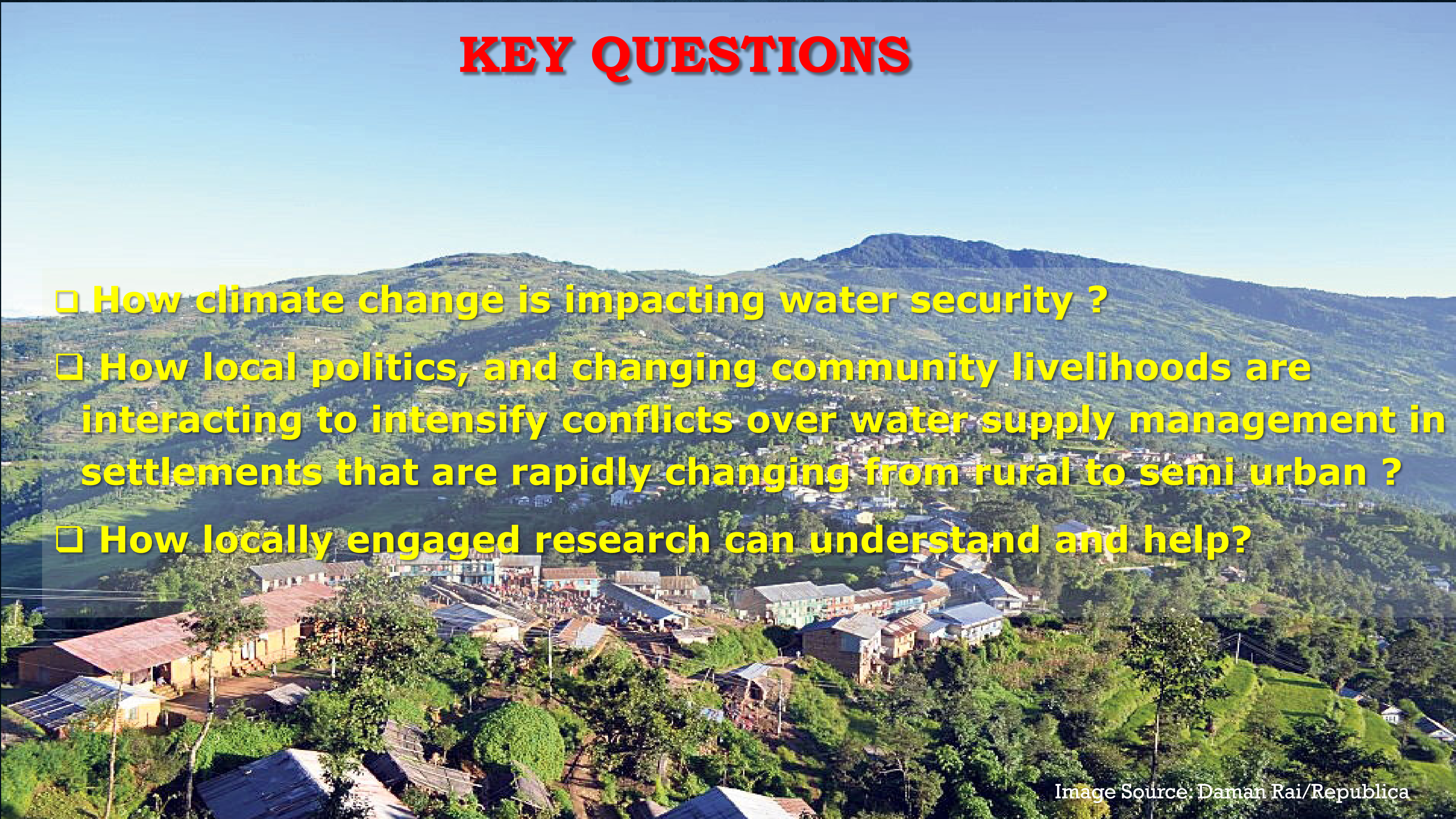

Image Source: Daman Rai/Republica

WATER GOVERNANCE CONTEXT

- Civil war in Nepal 1996—2006 increased poverty in Nepal[1]
- 28.5 percent of Nepali population is living in multidimensional poverty in 2018[2]
- High out Migration (since 2008/9 more than 4 millions Labour approval has been issued)[3]
- Absence of elected local government over 20 years
- Federal restructuring and 2017 local elections

1. Do, Q.-T., & Iyer, L. (2010). Geography, poverty and conflict in Nepal. *Journal of Peace Research*, *47*(6), 735–748.
2. National Planning Commission , 2018. Nepal's Multidimensional Poverty Index: Analysis Towards Action. https://www.npc.gov.np/images/category/Nepal_MPI.pdf
3. Nepal Labour Migration report 2020). https://moless.gov.np/wp-content/uploads/2020/03/Migration-Report-2020-English.pdf
4. Paudel, N. S., Ojha, H., Karki, R., & Gurung, N. (2013). Integrating climate change adaptation with local development: exploring institutional options. Journal of Forest and Livelihood, 11(1), 1-13.

CLIMATE AND WATER CRISIS

- Himalayan region - hotspot of water crisis under climate and persistent governance issues[5]
- Drying of springs[6]
- Increasing water conflicts between upstream rural and downstream urban areas[7] and between different community groups within the town[8]
- Governments lack water planning and development framework that is informed by present and future climate change scenarios


Source: Climate tarcker.org

5. Ojha, H., Neupane, K. R., Pandey, C. L., Singh, V., Bajracharya, R., & Dahal, N. (2020). Scarcity Amidst Plenty: Lower Himalayan Cities Struggling for Water Security. *Water*, *12*(2), 567.
6. Singh, S. P., Thadani, R., Negi, G. C. S., Singh, R. D., & Gumber, S. (2020). The Impact of Climate Change in Hindu Kush Himalayas: Key Sustainability Issues. In *Himalayan Weather and Climate and their Impact on the Environment* (pp. 453-472). Springer, Cham.
7. Kovács, E. K., Ojha, H., Neupane, K. R., Niven, T., Agarwal, C., Chauhan, D., ... & Michael, N. K. (2019). A political ecology of water and small-town urbanisation across the lower Himalayas. *Geoforum*, *107*, 88-98.
8. Devkota, Kamal, Dil Khatri, and Kaustuv Raj Neupane. "WATER CONFLICTS IN URBANIZING REGIONS IN THE HIMALAYA: CASE STUDIES FROM DHULIKHEL AND BIDUR IN NEPAL." (2018).

METHODOLOGY

- **Ethnographic research since 2016 in** Diktel and Khotehang
  - Interviews with local government officials, community leaders, wo women farmers and water user group's members, non-governmental organisations, and government agencies
  - ethnographic study of how of how poor, women and disadvantaged groups access and struggle for water.
- **Climate Data**
  - Mean temperature and precipitation data from the APHRODITE (Asian Precipitation Highly-Resolved Observation Data Integration Towards Evaluation of Water Resources; V1101 for precipitation and V1808 for temperature).
  - This daily gridded data are available at a spatial resolution of 0.25° × 0.25° from the period between 1961 to 2015.
- **Locally engaged Research**
  - Municipality level workshop to discuss water challenges as experienced by the local communities
  - discuss knowledge gaps in planning and identify the solutions.

LOCALLY ENGAGED RESEARCH (LER) TO IMPROVE LOCAL LEVEL PLANNING AND WATER GOVERNANCE

Evidence generation through reflective, interactive approaches

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Organized Water Forums as platform for sharing and-production of knowledge

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Development of participatory strategic planning around the -management of water conflicts, future climate risks

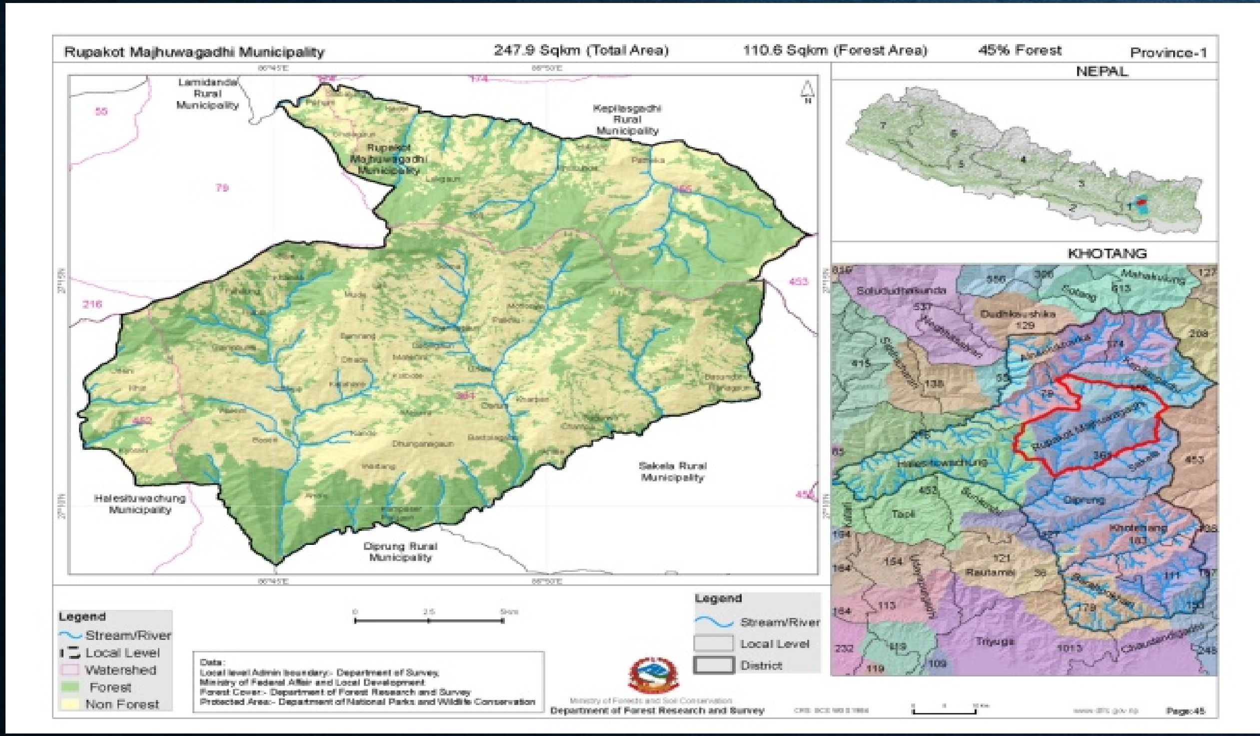
Stories of two small Himalayan towns in Nepal

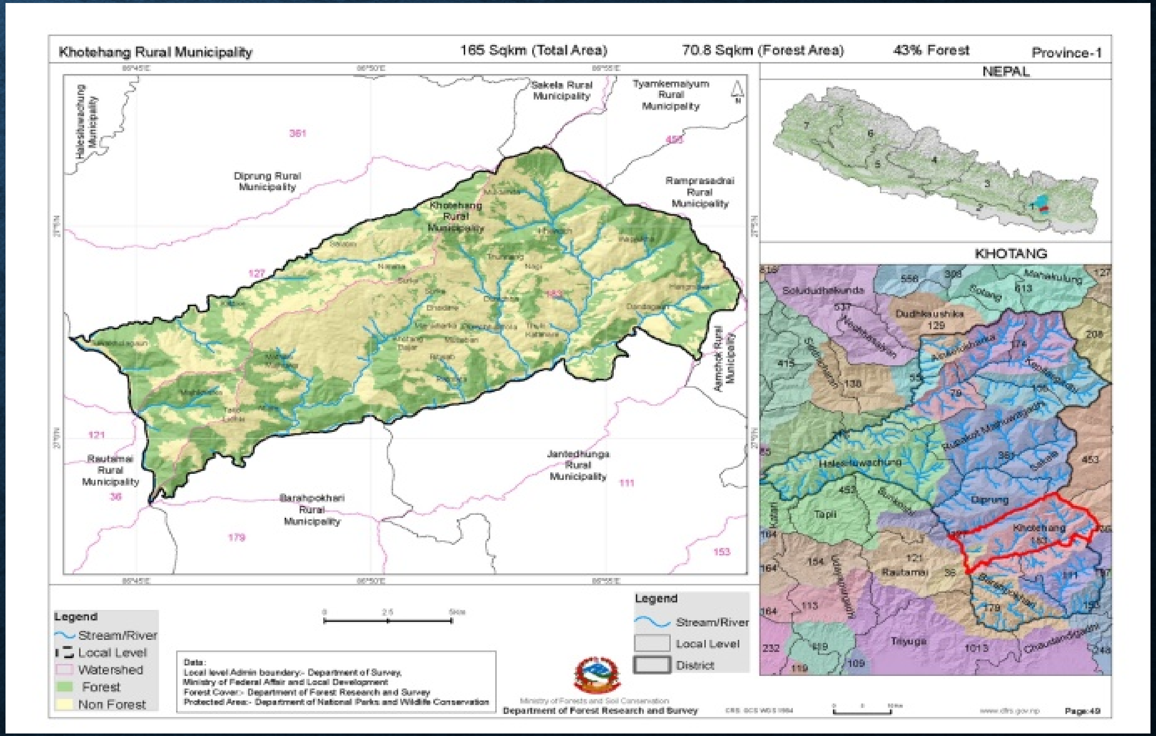
Diktel:

- Hilltop town, gentle slope and in wet landscape with plenty of spring water sources and two small streams
- Its residents relied on water collected from 'kuwa' (small water trenches at small water points).
- Access to piped water - 12 public taps -1977 AD funded by British Gurkha Welfare
- New water supply system supported by Asian Development Bank covering 1049 households.

Khotehang

- No upstream water sources of it sown
- The formal water supply begun from 1990's with the support of British Gurkha
- Welfare Society Prior to 1990's people were dependent on community taps.



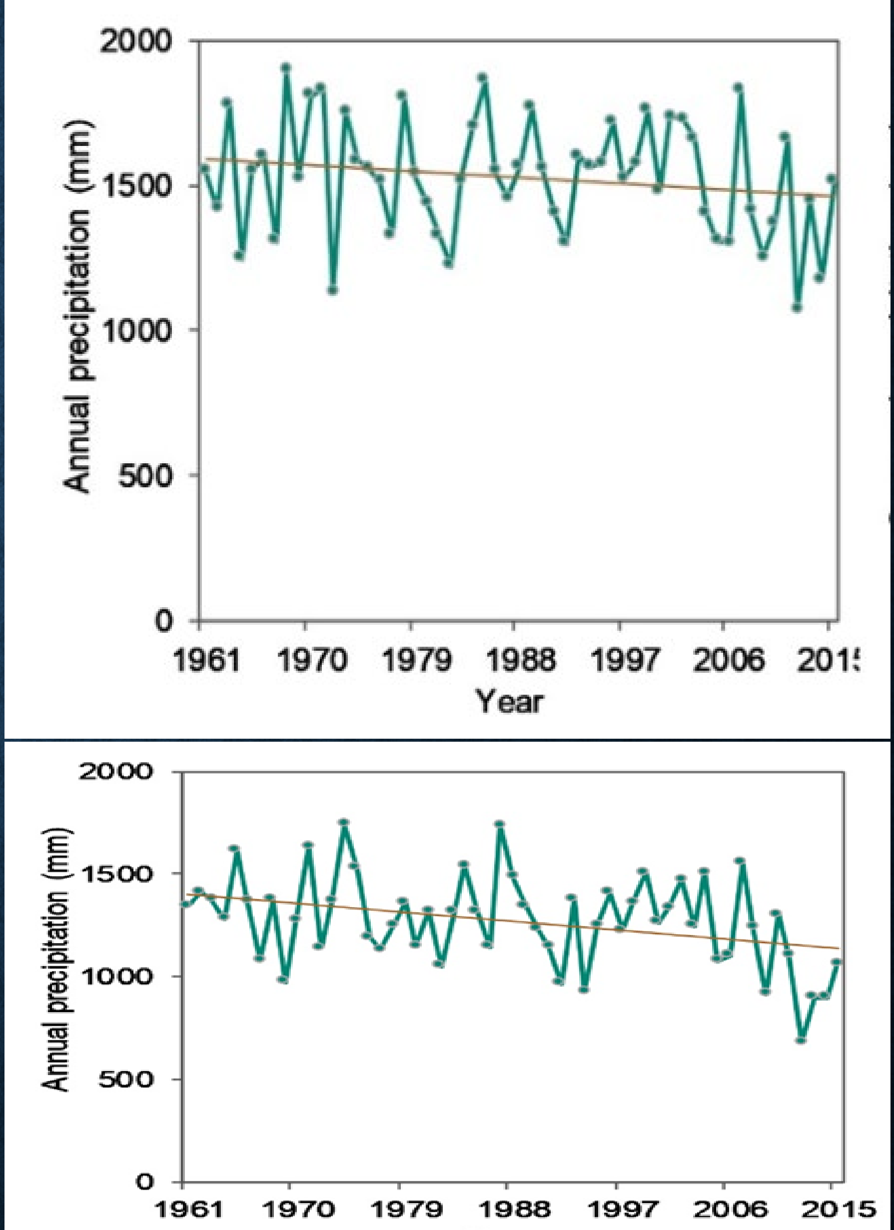


A BRIEF DESCRIPTION OF DIKTEL AND KHOTEHANG

Area	246.51 Sq Km	164.09 Sq Km
Population	46,903	22474
Households	10050	4703
Literacy Rate	74.91 (Male 83.42, Female 67.74)	67.86 (Male 78.4, Female 58.87)
Number of streams flowing through the area	5 (Rawa, Sapsu, Tawa, Mewa and Dekhuwa)	3 (Khiew, Sawa, Dumchha)
Ethnicity	Rai, Chhetree, Brahman, Newar, Kami, Tamang, Sarki, Damai, Gharti Bhujel	Rai, Chhetree, Brahman,Kami, Newar, Sarki, Tamang, Damai
Agriculture	Total 28507.82 ha; cultivalbel land 12548.40	Total 16964.15 ha, 7173.40 Cultivable land
State of out-migration /Absent Population	3487	1469
Local government system and structure	15 wards	9 wards
Drinking water supply system	8154 Taps	3237 Taps
Households without toilets	1927	2227

CLIMATE CHANGE AND IMPACT ON WATER SUPPLY

- The Khotehang had warmed up by 0.55° degree Celsius and Diktel by 1.10° degree Celsius over the last 55 years
- Both regions have witnessed increased drought and decreased annual and seasonal precipitation whereas
- Annual precipitation has decreased significantly with -4.67 mm/year in Khotehang and Diktel.
- Local residents complain about drying of springs in their region.
- One author grew up in the same village more than four decades ago noticed declined in volume of water in spring on which he used to collect during his childhood days.



Annual Precipitation trend of Diktel (top) and Khotehang below

GROWING WATER CONFLICTS

- Water conflicts in both areas are on rising trend in the last 15 years:
- Conflicts between two Municipalities and neighbouring villages
- Rise in water demand in upstream areas
- Demand for compensation for diversion of water
- Distributional conflict within the Municipality
- Conflict over priority of water use : drinking versus irrigation

Source: Khotang today

LIMITED PLANNING AND GOVERNANCE CAPACITY

- Lack of climate risk integration in local water planning
- It does consider environment as an important aspect but not explicit recognition of climate change.
- The new municipality officials have recognised the value of gathering environmental information in their development planning.
- Amidst the ongoing process of policy and institutional reform and chaotic policy environment, town of Diktel has started to upgrade its drinking water scheme.
- With the new scheme not only the scale of water scheme has been increased but also complexities of managing water in the town.

Rupakot watershed area and in its absence, there would remain no alternatives than water lifting and there would be no river. So, the municipality has planned to manage and conserve Rupakot watershed area as special watershed area. But we need support of experts on it.
(Mayor of Diktel in Diktel Water Forum, Jan 2020).

CONCLUSION

- Water conflicts are on rise changing climate and mainly because of the limited institutional capacity of the local governments as well as unclear policy
- Himalayan urbanising region is in need of fresh thinking and approach to transformative and sustainable water management that puts long term water security at the core
- Water planning and development is hardly informed by climate change impact and demand scenarios
- Locally engaged research (LER) contributes to deliberative water planning towards water security.
- LER is an evolving approach which is contributing water management by downscaling climate science and empowering local knowledge.


THANK YOU FOR LISTENING.
COMMENTS AND QUESTIONS WELCOME!