

# Water Security in Times of Rapid Urbanization and Environmental Change: Investigating Water Management Systems in Kavre Valley, Nepal

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# Context

- Towns situated at higher altitude lacks higher elevation mountain landscape to supply spring water
  - Dhulikhel has tapped water from Bhumidanda located 14 km away since two decades
  - Water demand has escalated in towns
  - Kavre valley struggling to achieve water security.
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- An aerial photograph of a town built on a hillside, surrounded by lush greenery and mountains in the background. The town features several multi-story buildings and a mix of residential and commercial structures. The terrain is hilly, and the overall atmosphere is hazy, suggesting a high-altitude or mountainous region.

# Research questions

What are the water management challenges?

What are the initiatives for the proper water management in the valley?

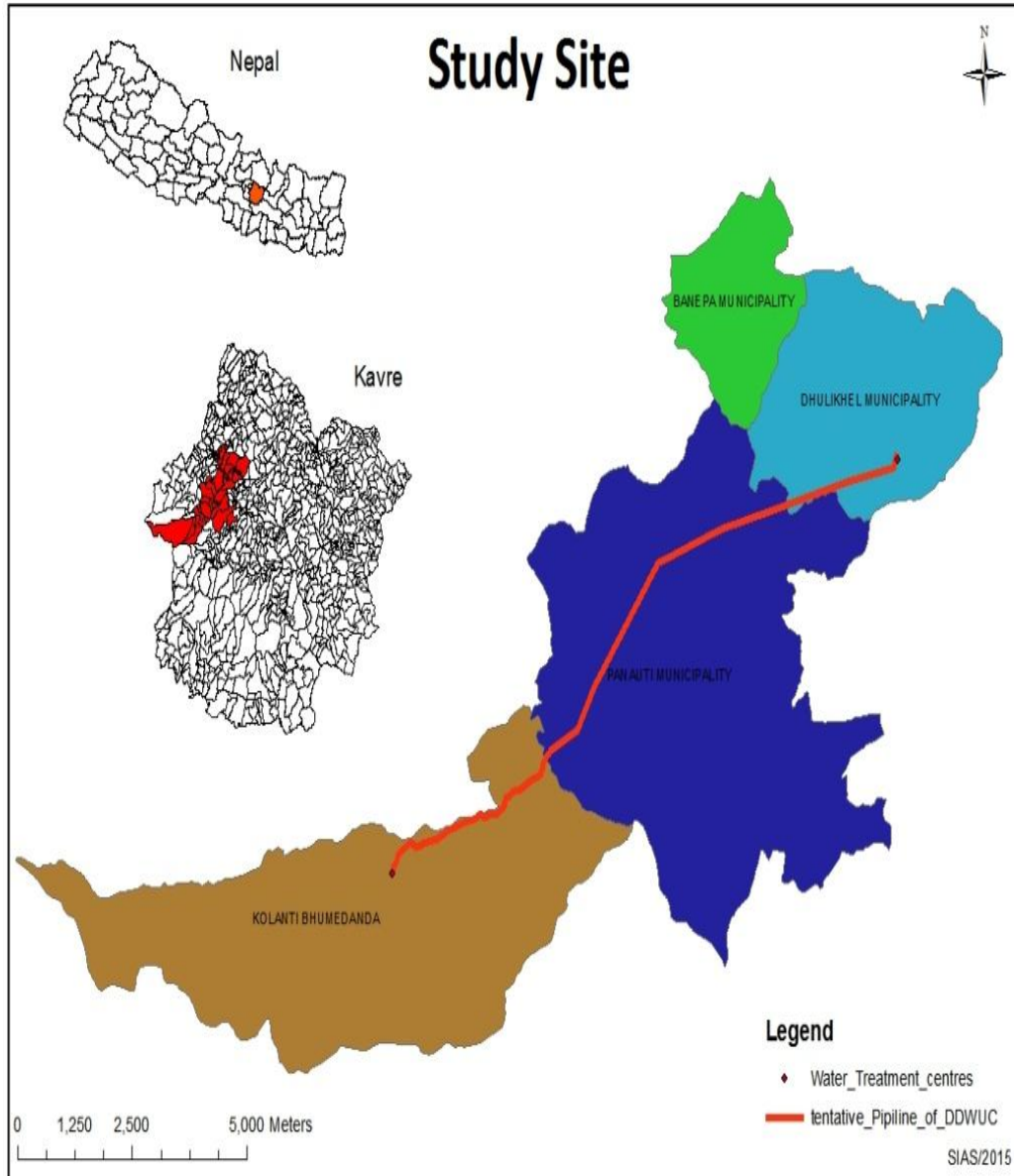


# Methodology

- Desk Review
- Key Informant Interview-16
- Focus Group Discussion-4
- Stakeholder Workshop-2
- Observation
- Face to Face Interviews-41
- GIS Based Mapping
- Hydrological Analysis



# Study site



# Water Scarcity leading to conflict

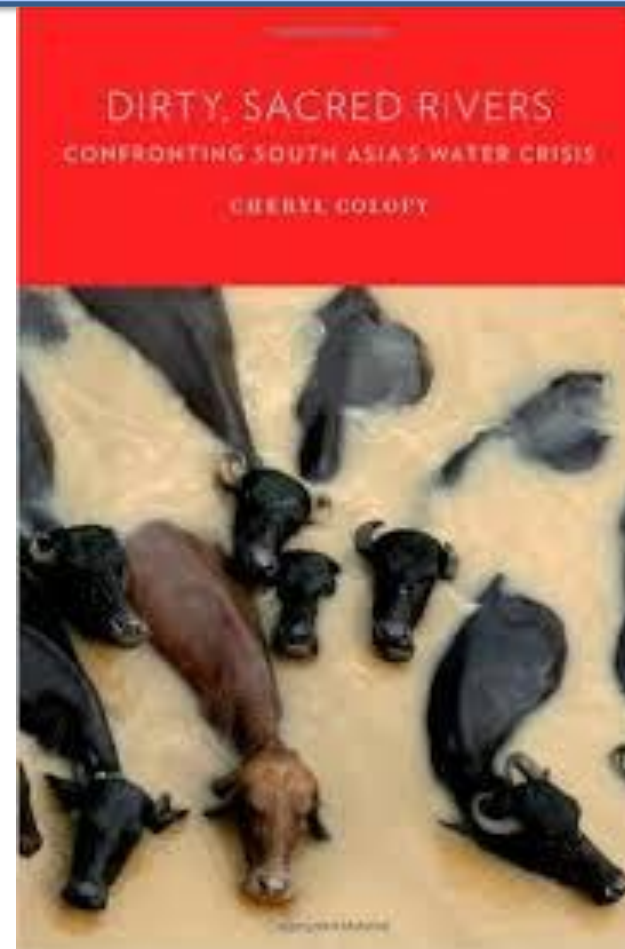
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## Drinking water supply resumes in Dhulikhel

2008-12-08 03:53

KAVRE, DEC 08 - Supply of drinking water resumed in all the VDCs of Kavre district headquarters Dhulikhel from Monday after being cut off for a week. The local residents from the outskirts of Dhulikhel had wrecked the water pipelines of Dhulikhel Drinking Water Consumers' Committee saying that the supply was done in an unfair manner. The pipelines were repaired after an agreement was reached to supply drinking water in all the Vices and to include five members of the agitating side in the Consumers Committee. Representatives of political parties, technicians, chief of consumers committee, local administration and the agitating side had reached the site this morning to repair the pipelines wrecked near Punyamata River at Chaukot and Dhalmalle of Panauti. The agreement was reached in all-party meeting held for two consecutive days since Saturday.

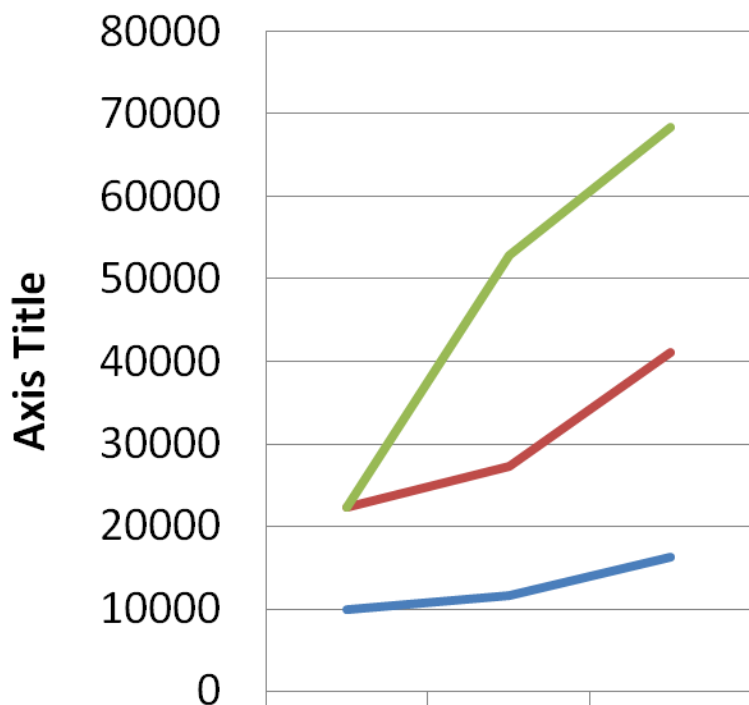
Link:<http://202.166.193.40/2008/12/08/related-article/drinking-water-supply-resumes-in-dhulikhel/169645.html>



Dhulikhel was without water for two weeks. The act of vandalism plunged the grown-up, developed Dhulikhel with its modern hospital and university back into the dark age of water insufficiency. Residents had to go to streams and standpipes again, filling buckets for kitchen use, forgoing showers carrying laundry out into the woods to wash.

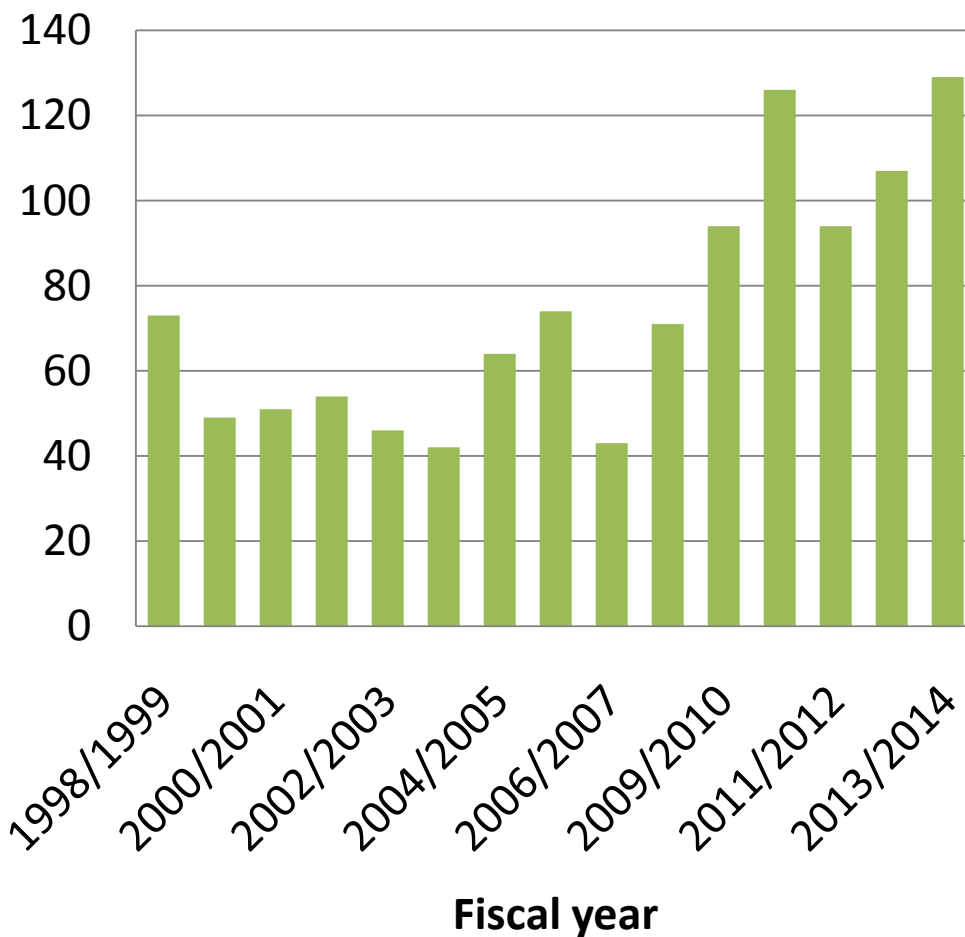
# Population growth and expansion of municipalities

## Population growth



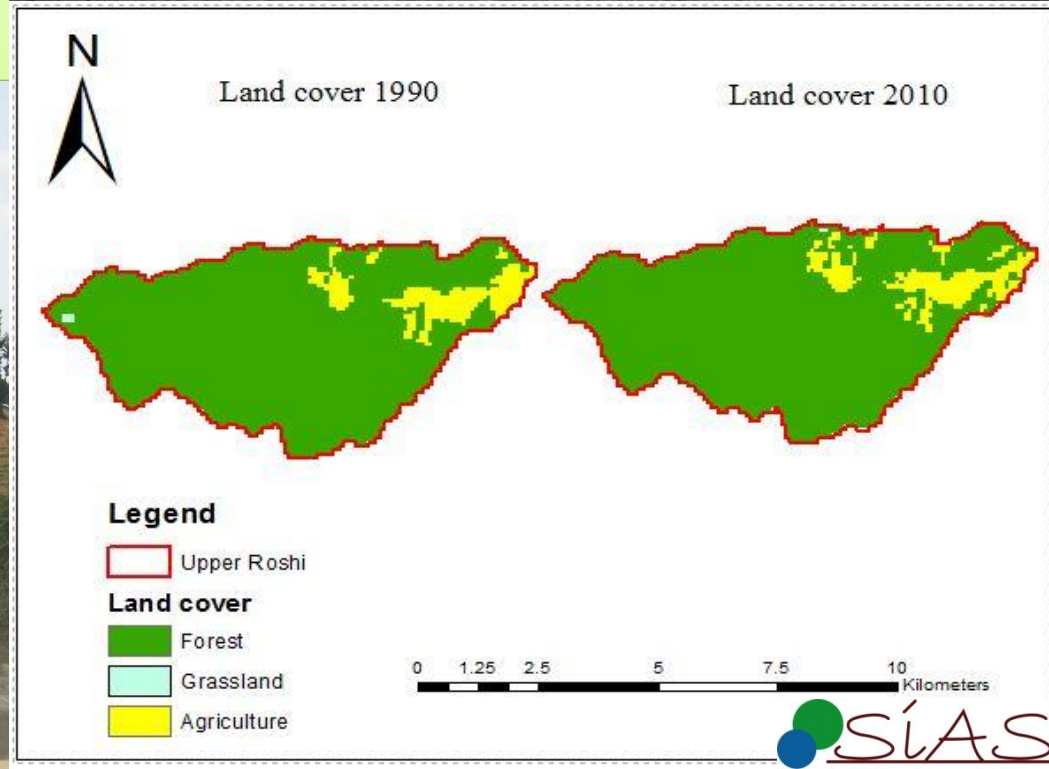
	1991	2001	2011
Panauti		25563	27358
Banepa	12537	15822	24764
Dhulikhel	9812	11521	16263

## Trend of Building Construction in Dhulikhel



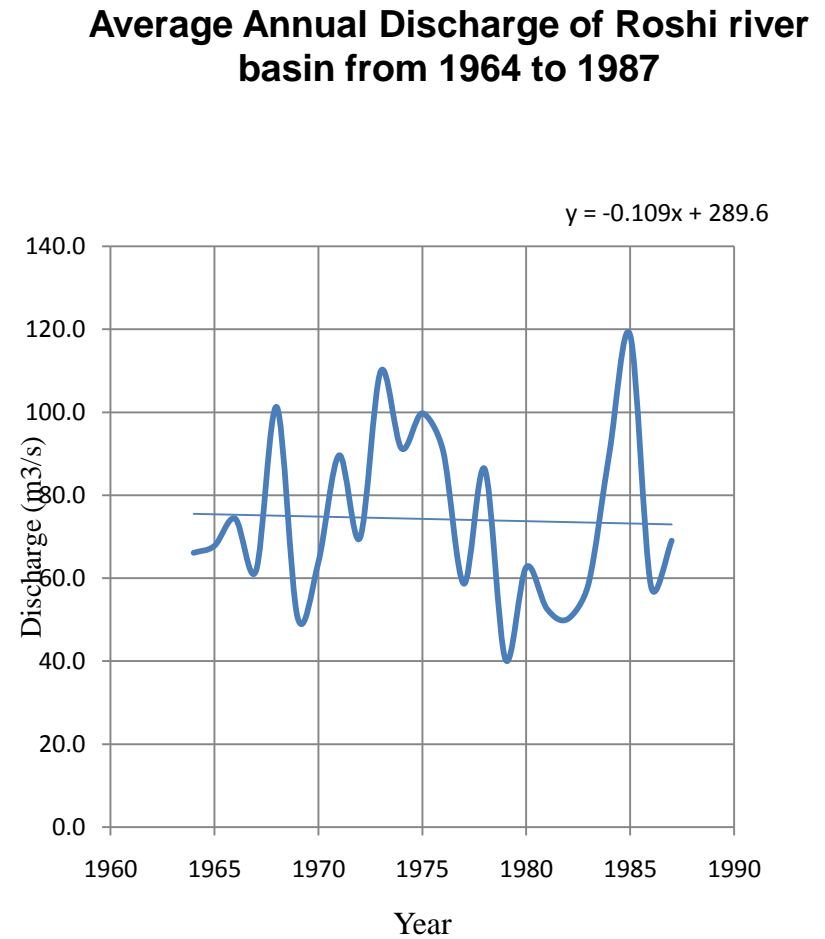
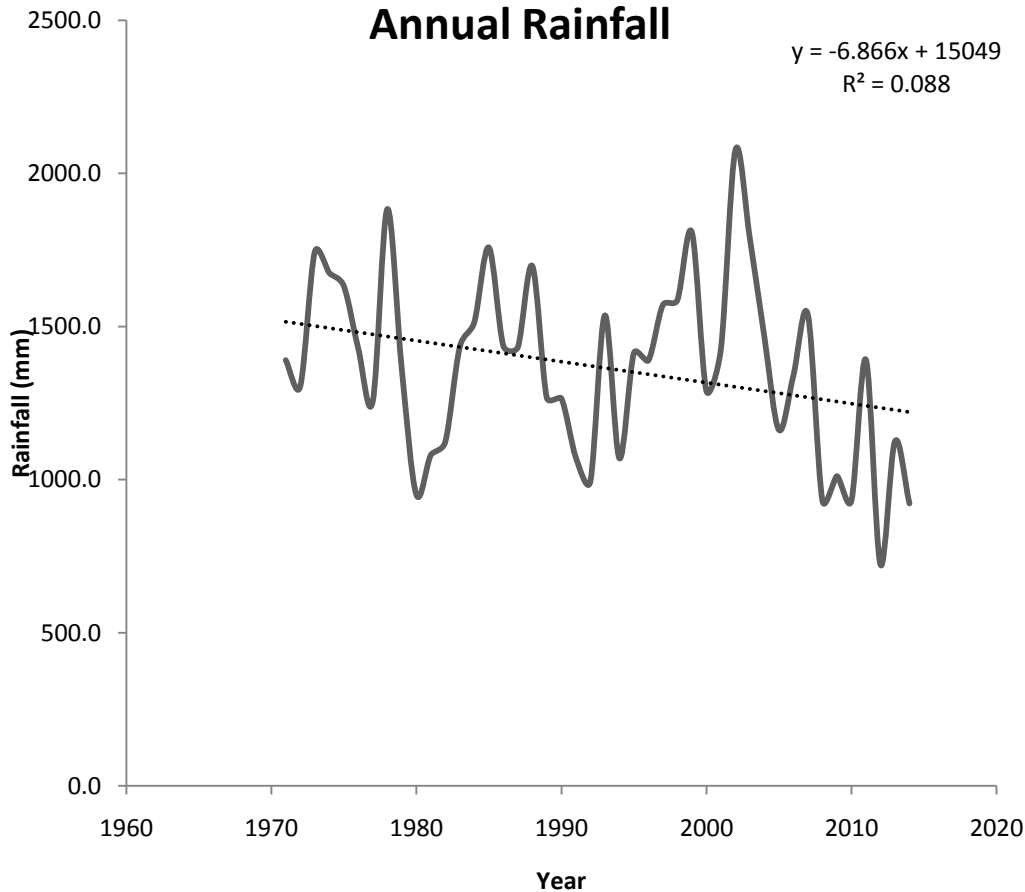
# Land use change/ stone quarrying

- Mining started 2007
- No. of stone quarrying sites -7
- Quarry Area : 11.2 hectare(1 Hectare =19.965 Ropani





# Hydrological challenges



# Decline in water volume

- Majority of upstream people perceive water has decreased
- Water volume at source is reduced (52l/s (1987 AD) to 37l/s 2015AD)---???



# Starving for water in the future...

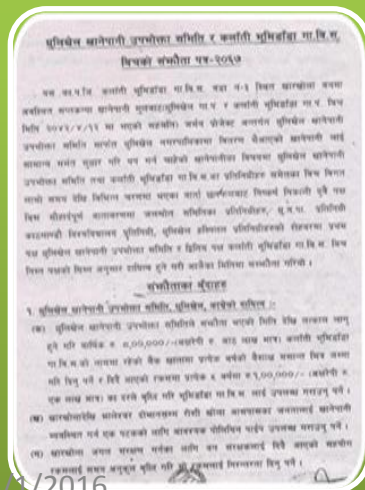


# Some efforts to overcome water security



## Kavre valley agreement, 2010

\* Annual payment NRs 75 Lakhs to the upstream VDC for the initial five years



## Agreement, 2011, Dhulikhel Water User Committee

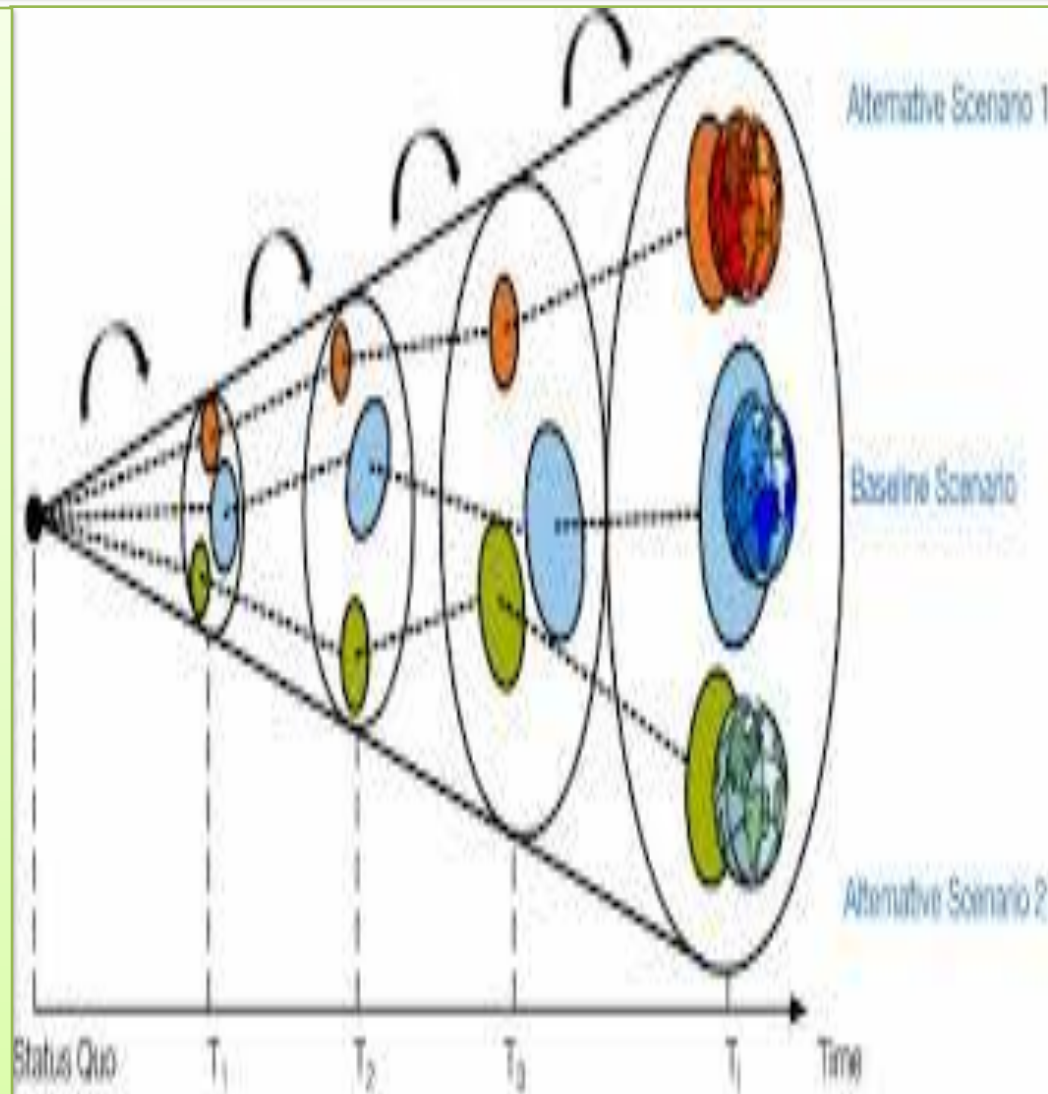
- Annual payment NRs 8Lakhs to the upstream VDC, NRs 2 Lakhs for the school
- NRs 36000 to forest guard in the lieu of protecting the watershed (Kharkhola CF)- 200 ha.

# Efforts enough.....???



# Future scenarios.....Proposed

- Baseline Scenario
- Competition/  
Conflict/ Rapid Land  
use change
- Consciousness



# Acknowledgements

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Thank you!

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