



Presentation from  
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Forests, water and  
sustainable growth of cities

# Valuing ecosystem services in local water use decisions in Nepali mid- hill towns

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# Himalayan town

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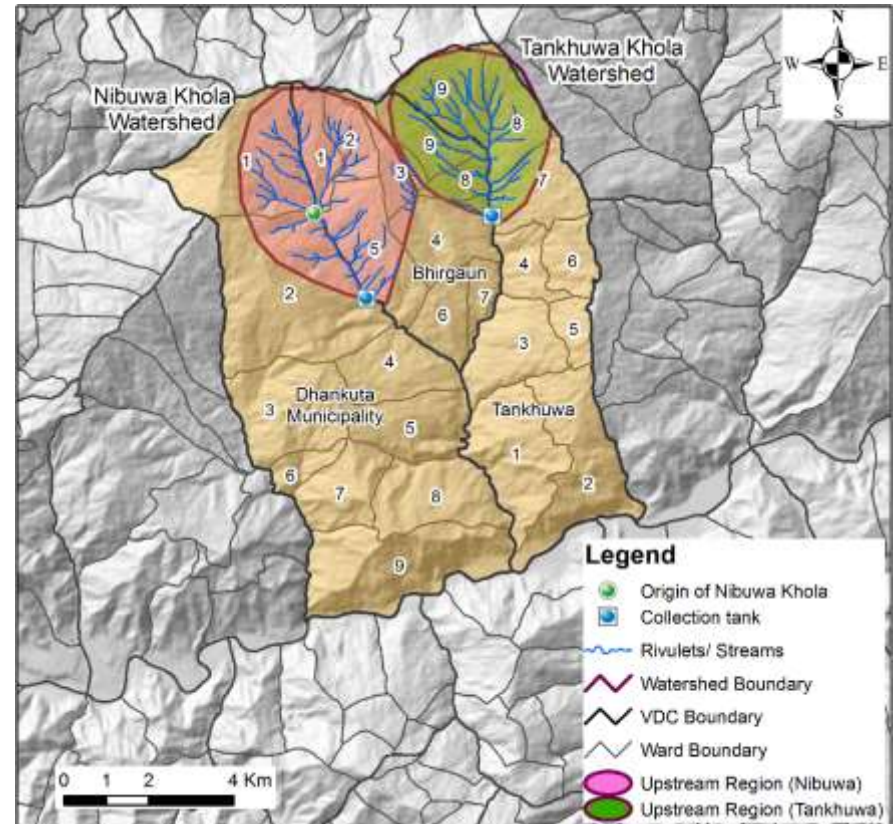
# Himalayan town



# Water woes of Dhankuta municipality

## Regional headquarters of Nepal eastern development region

- Population – 27,000
- Rapidly urbanizing
- Water supply
  - 80% piped
  - 20% springs



# Water woes of Dhankuta municipality

## Regional headquarters of Nepal eastern development region

- Water needs - 447 Lit/ HH/d
- Water shortage
  - Monsoon 1hr/d, 5d/week
  - Dry season 1hr/d, 4d/week
- Household water expense / month
  - Piped water – USD 3
  - Water tanker – USD 7
  - 30 hr. to fetch



# Perceptions

- “..Sallo (*Pinus roxburghii*) forest is drying up our natural water spring”..
  - Elderly man, watershed area
- “...Upstream watershed is the main source of water of our municipality, ... conserving forests is key for sustaining water supply”..
  - District development committee rep.
- “...There is a need to provide incentive to upstream communities for conserving forest”...
  - Indra Rai, Politician



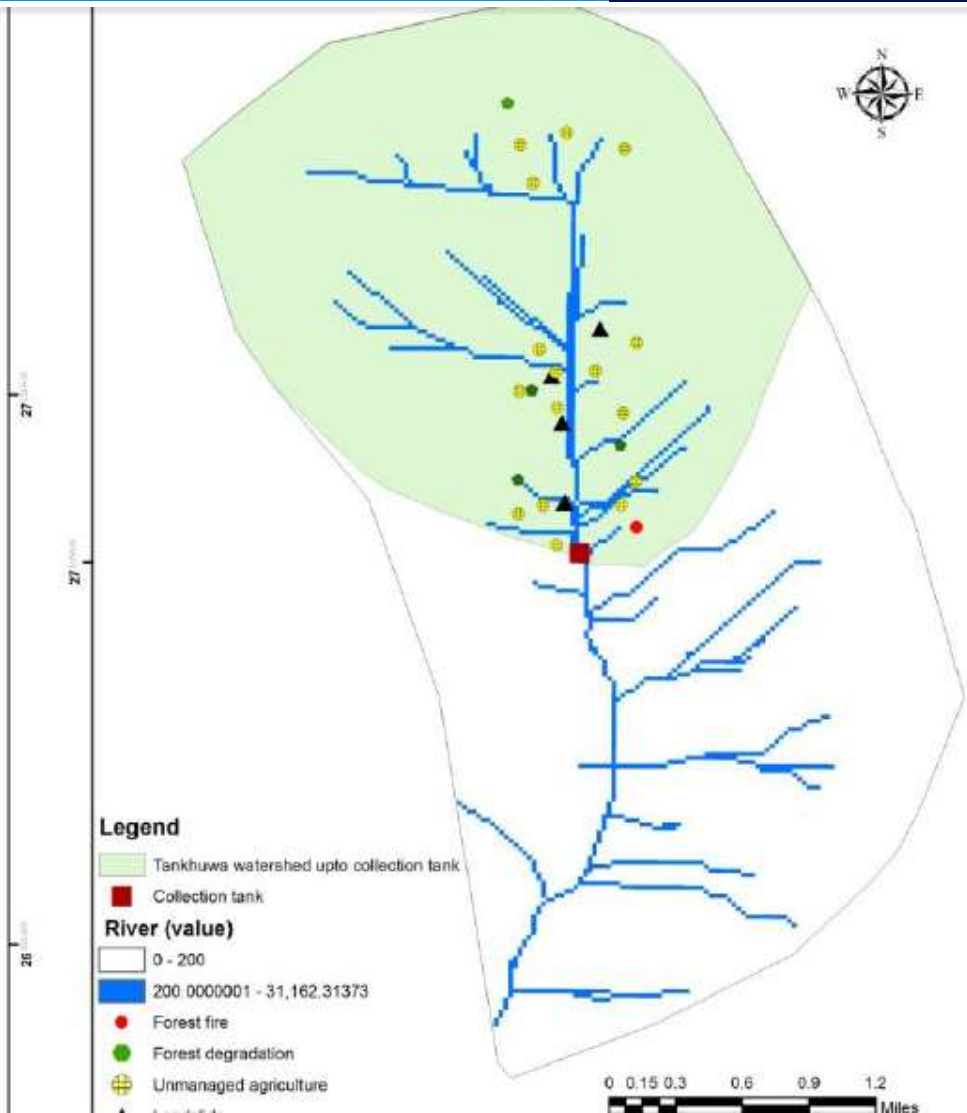
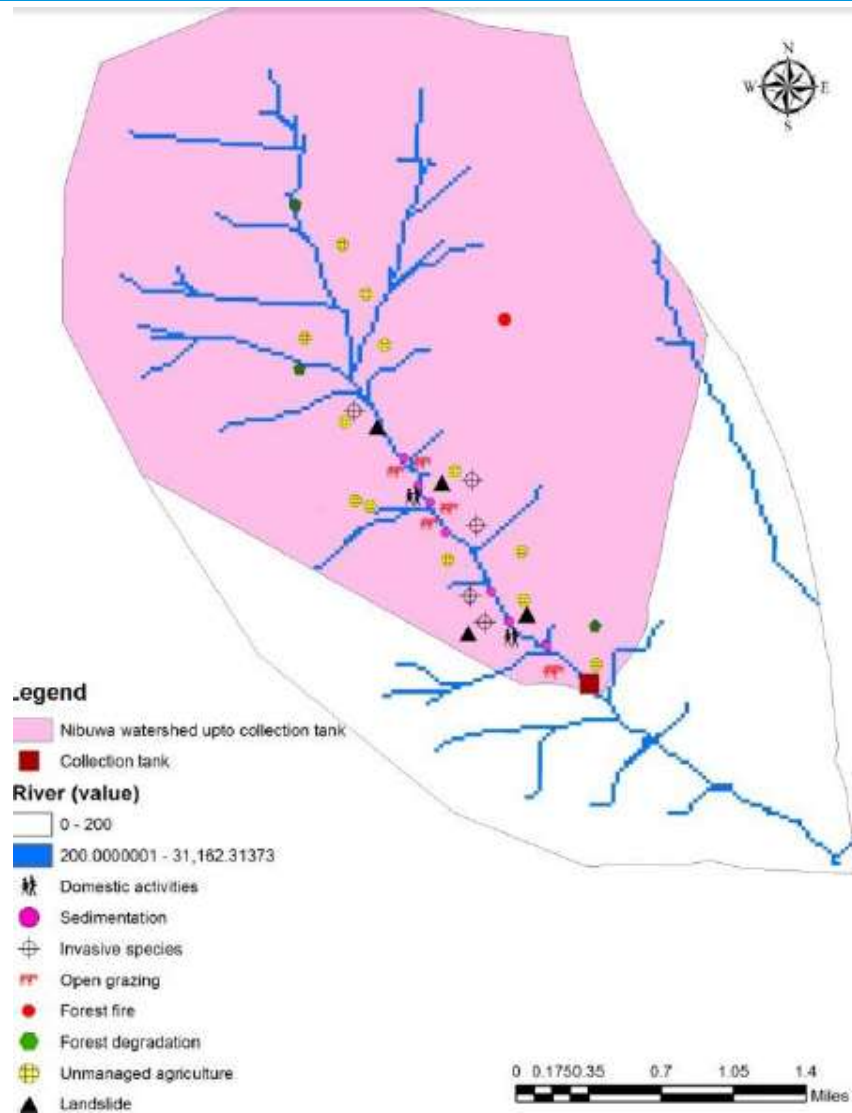
# Degradation of watershed

- Siltation of collection tank
  - Deforestation, Agricultural practice
- River flow decrease
  - 50% in 15 years
- Water quality deterioration
  - Pesticide, doubled in 5y
- Drying of springs
  - No conservation
  - Unplanned infrastructure





# Degradation of watershed



- **Assessment of scope for PES**
  - Willingness to participate in the watershed management
  - Federation of Community Forests Users Nepal, Multi-Stakeholder Forestry Program, District Soil Conservation Office, and local Non-Governmental Organizations.
- **Identify attributes of water supply status and expectations**
  - Focused group discussion
  - GO, NGO, local residents

- Choice scenario development through Household survey
  - Water users - willingness-to-pay (WTP) for water and existing practices of household water management
  - Upstream watershed - agriculture practices, livelihoods and households constraints
- Negotiation and agreement
  - PES fund management
  - Framework for fund distribution
  - WS management interventions
  - Monitoring committee

- **Payment by downstream user**
  - USD 5/m, water supplied 24 hours every alternate day
  - UDD 6/m, water supplied 24 hours every day
- **Payment type - in-kind support preferred**
  - Lack of trust in governance system

- **Local government(s) - critical**
  - No umbrella legislative instrument in Nepal
- **Tripartite institutional mechanism**
  - Town water supply management committee
  - Watershed management committees
  - Town municipality (intermediary, subsidiary)
- **A monitoring committee**
  - Includes government line agencies and local development partners

- **More willingness to pay (WTP)**
  - Women headed household
  - Higher household income
  - Larger families
- **Upstream communities - weak in negotiation**
  - Improved knowledge needed
- **Forests-water relationship**
  - need immediate consideration in overall development planning

- Forests - both at upstream, and downstream
  - key for sustaining water supply
- Forest ecosystem changing, both in species pattern, and cover
  - impacting water availability
- There is willingness to pay for conserving upstream forest ecosystem
  - downstream communities

# Thank you

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# Preference of different forms of compensation

