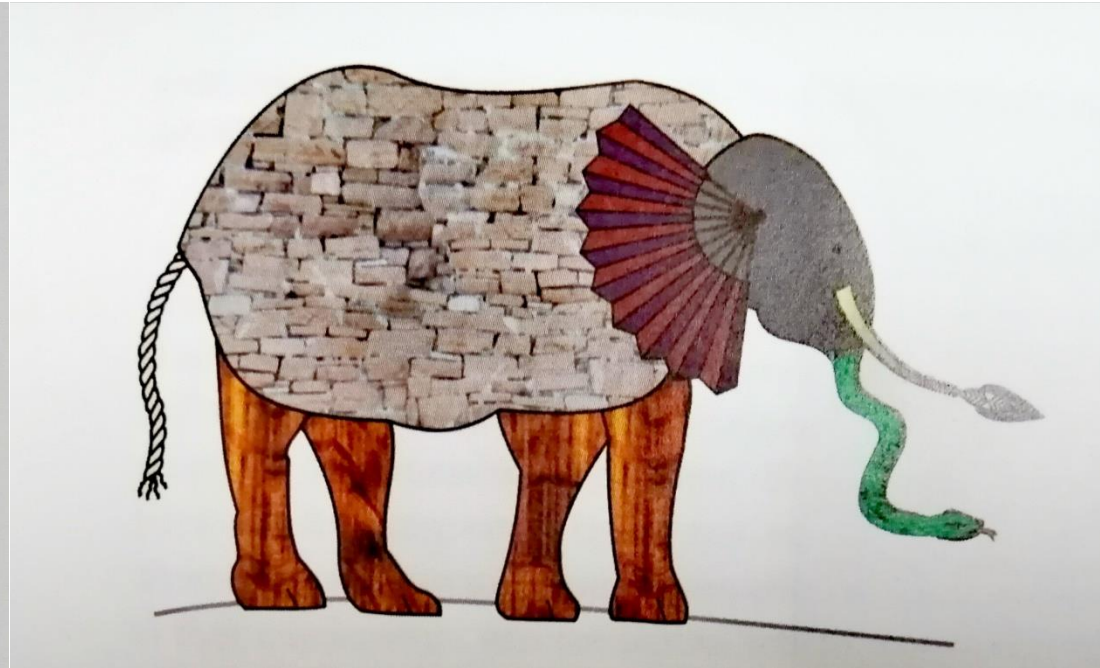
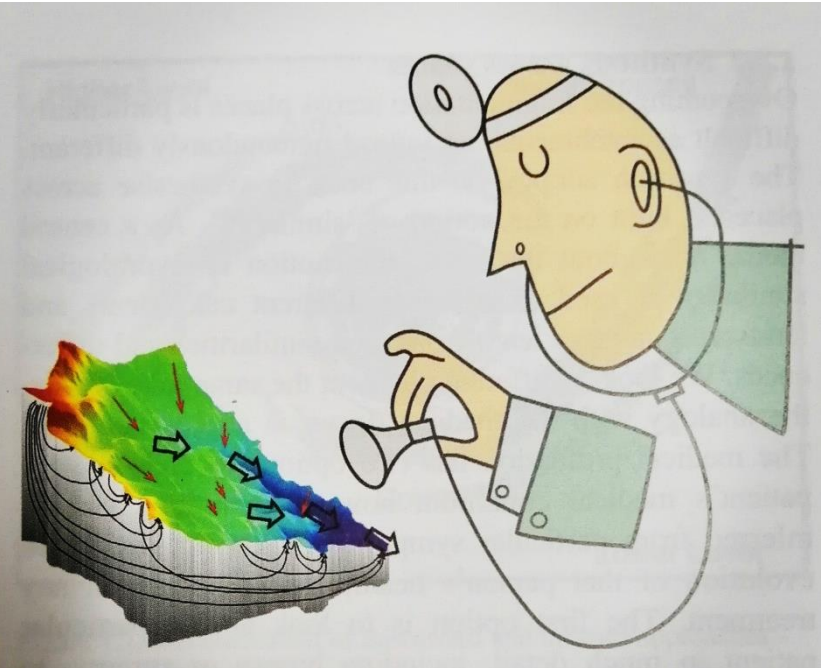
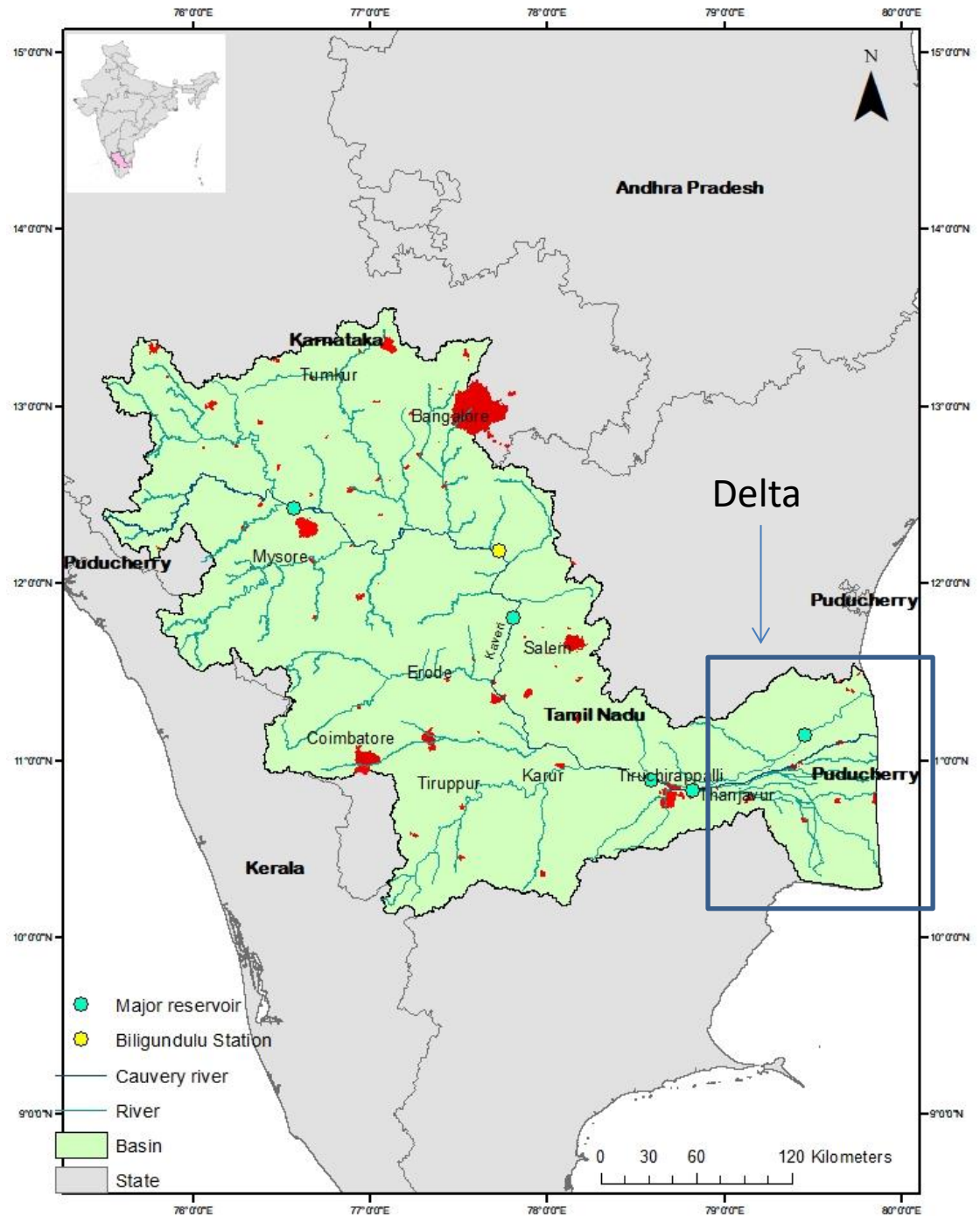


# Insights from studying patterns of co-evolution at watershed scale in Cauvery Basin

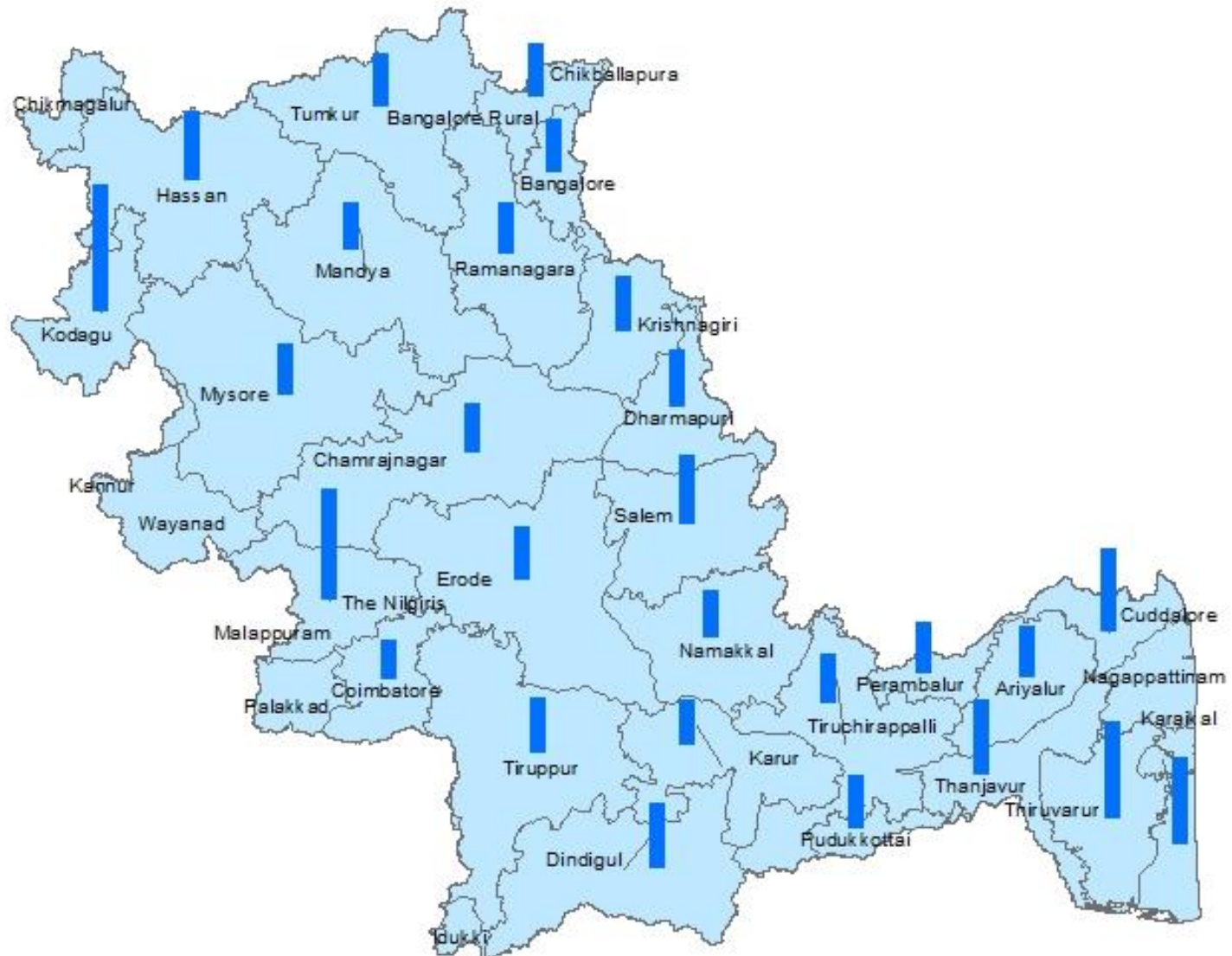


Neha Khandekar  
Ganesh Shinde  
Veena Srinivasan

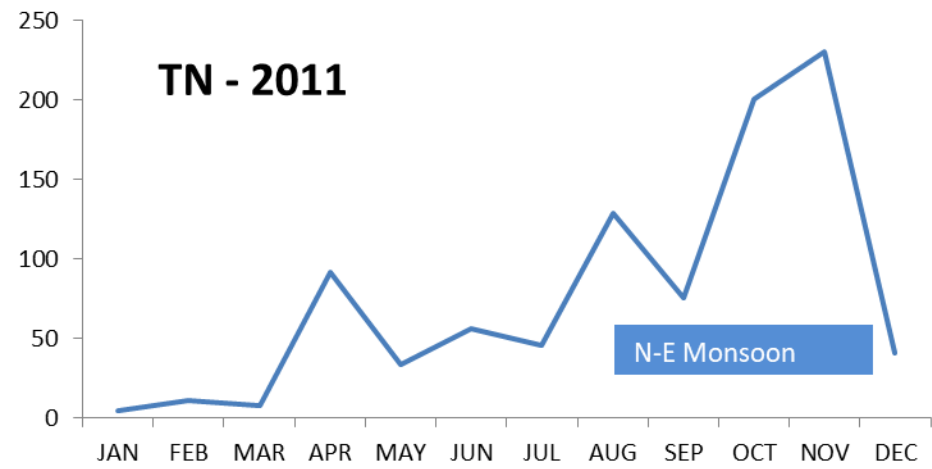
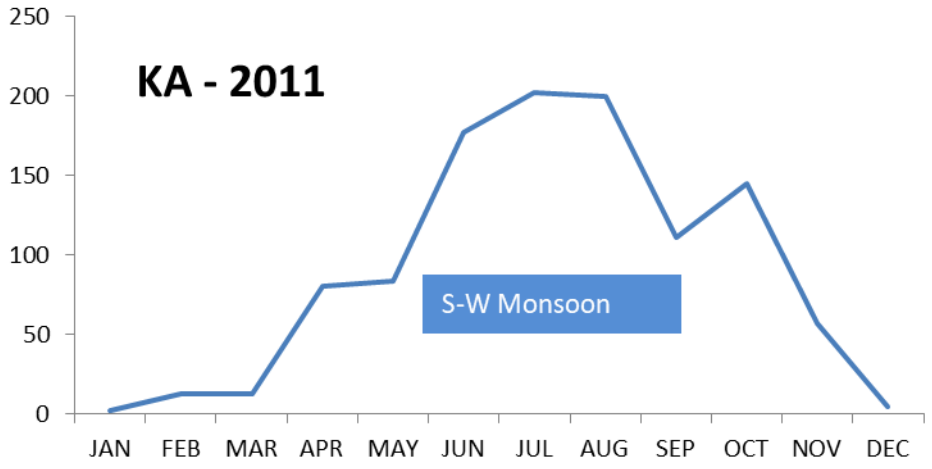
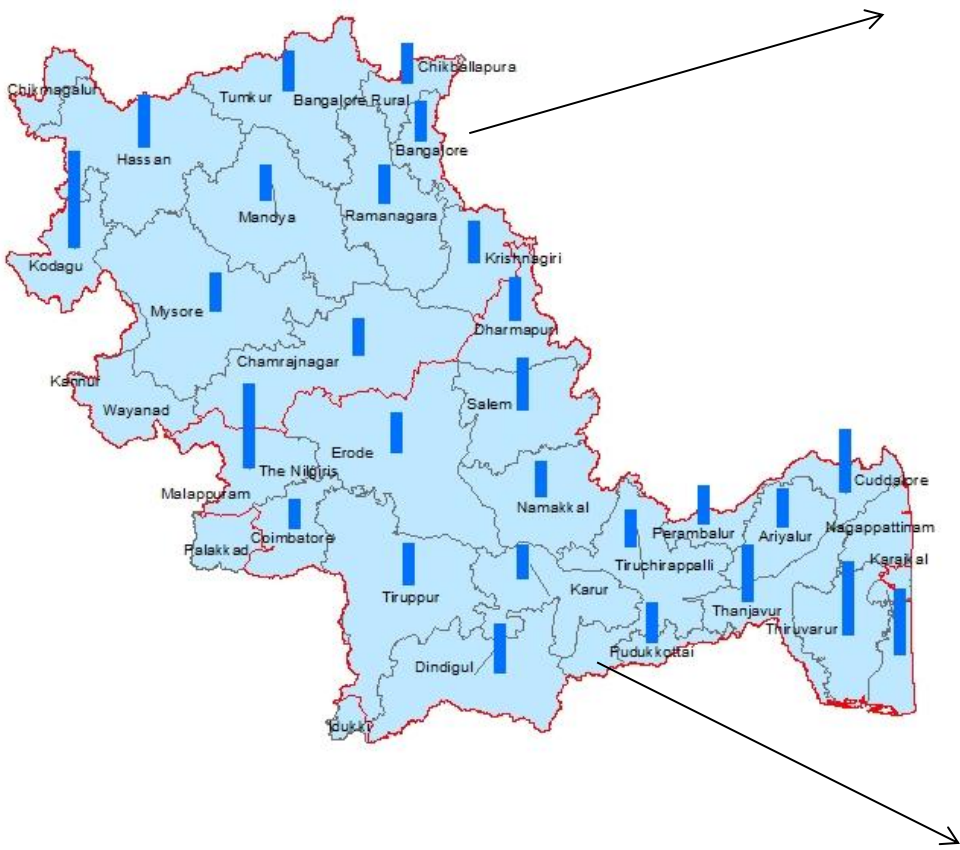
# Context



# Highly variable precipitation



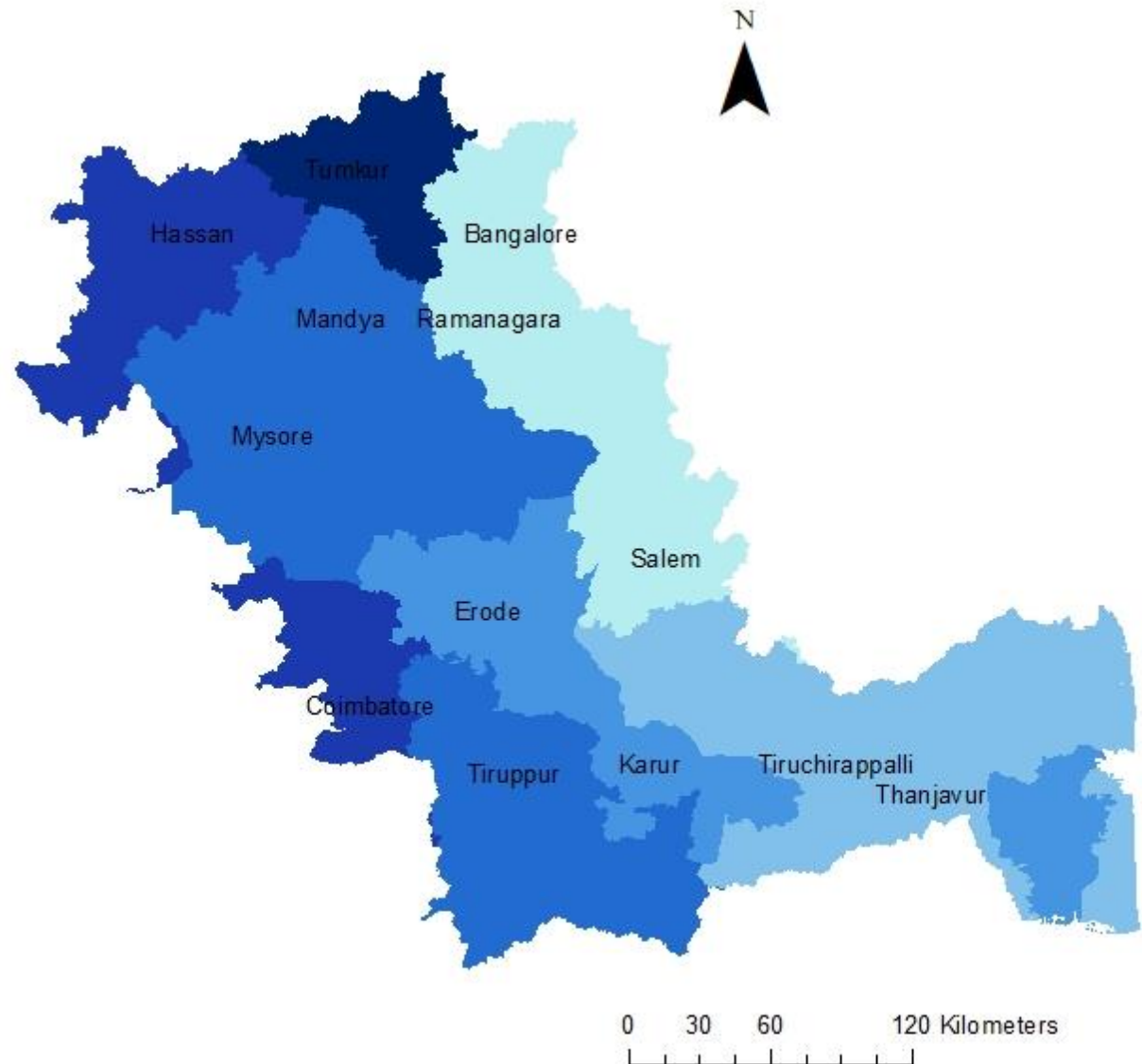
# Highly variable precipitation





# Aridity Index

Most runoff generated in western ghats and Nilgiris

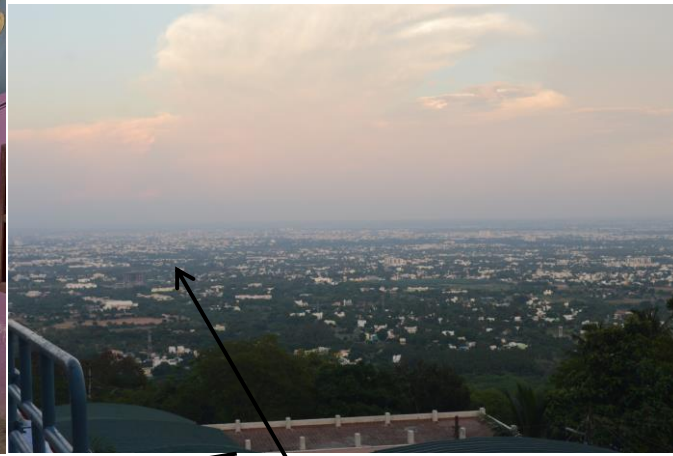




## Reconnaissance survey







Credits: Crelis Rammelt and author's own

# Motivation

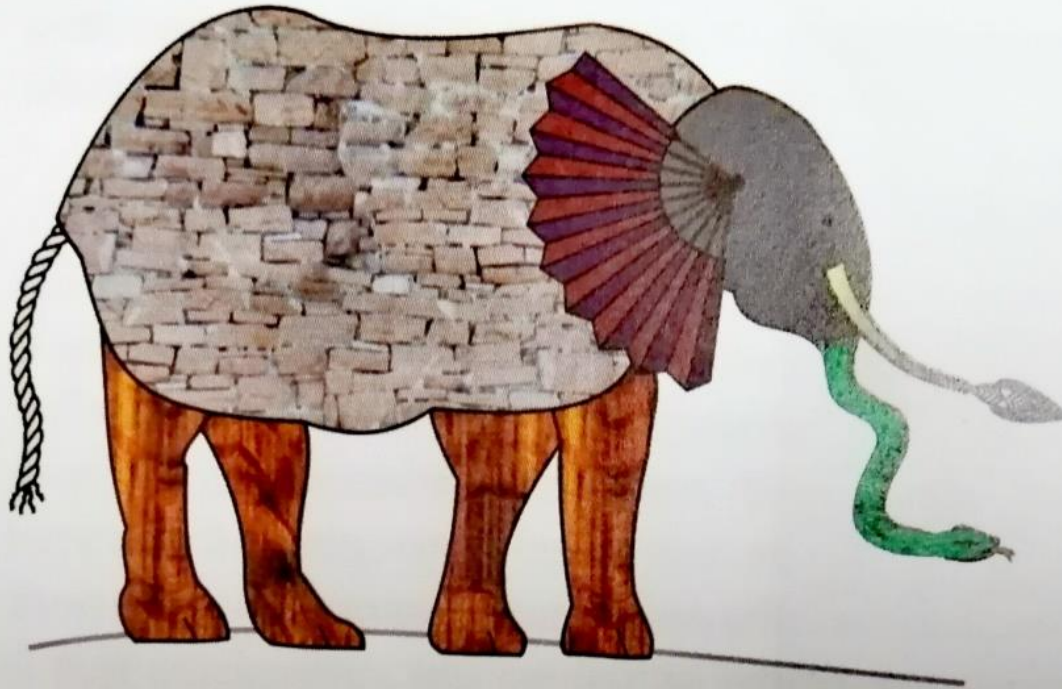
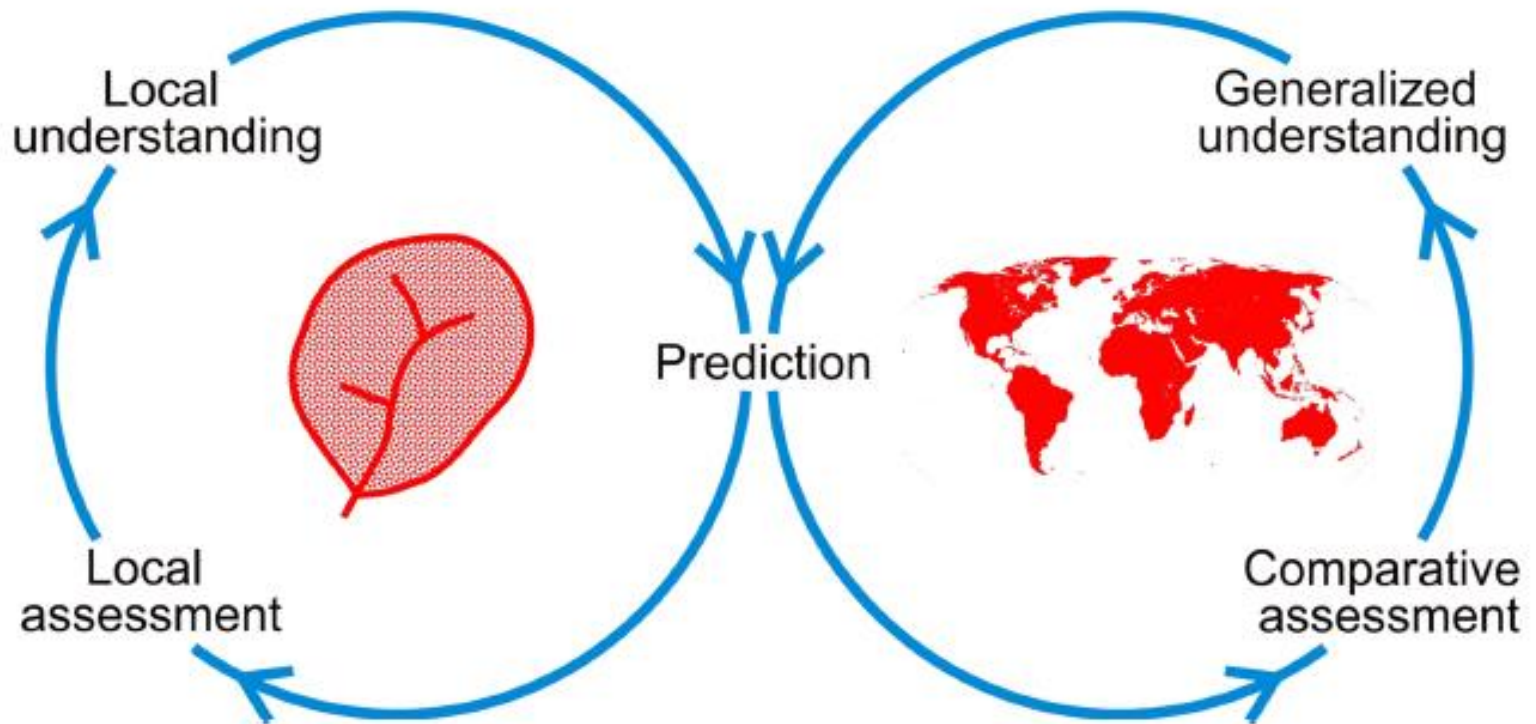


Figure 1.3. Fragmentation in hydrology: similar to the six blind men, a fragmented approach to hydrology makes it difficult to see the full pattern of catchment processes. From Sivapalan *et al.* (2003b), © Jason Hunt.



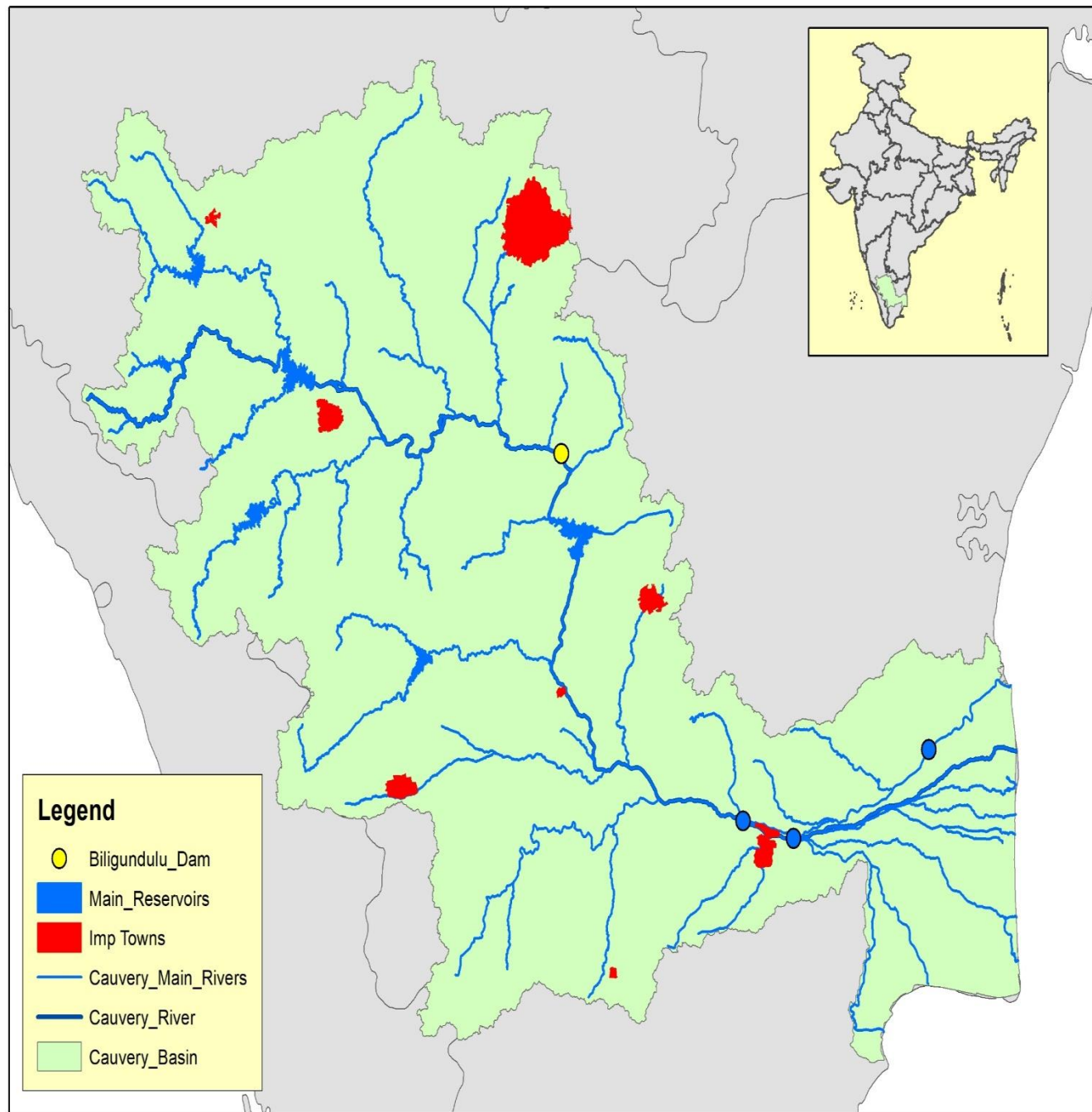


Blöschl et al., 2013

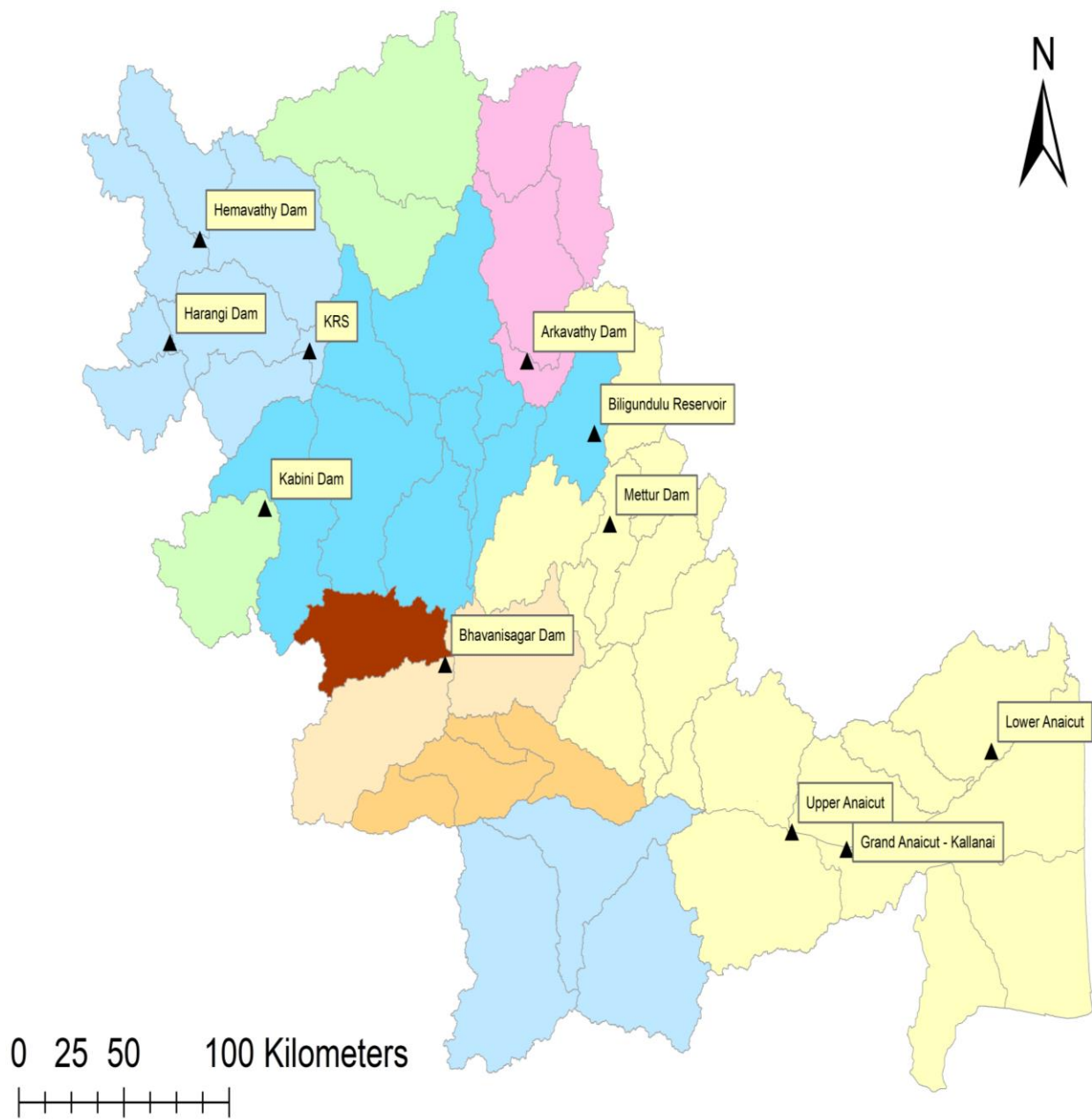
# Research Question

What are the explanatory drivers behind pathways of evolving watersheds in the Cauvery basin?

Are there any patterns of similarities in the pathways of two/ more watersheds?





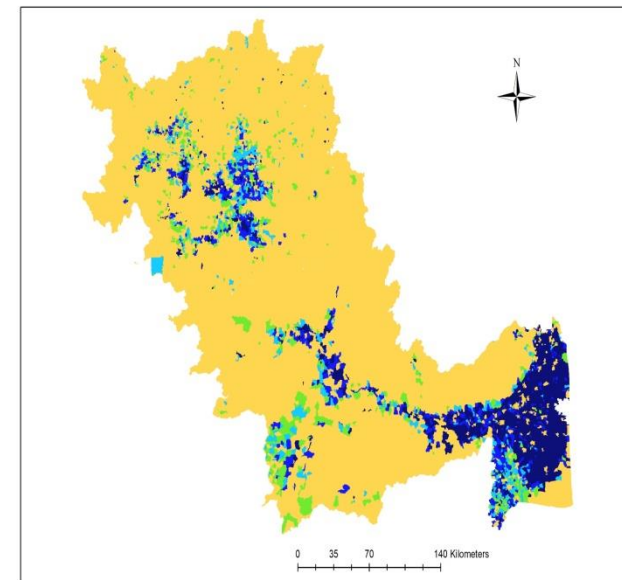
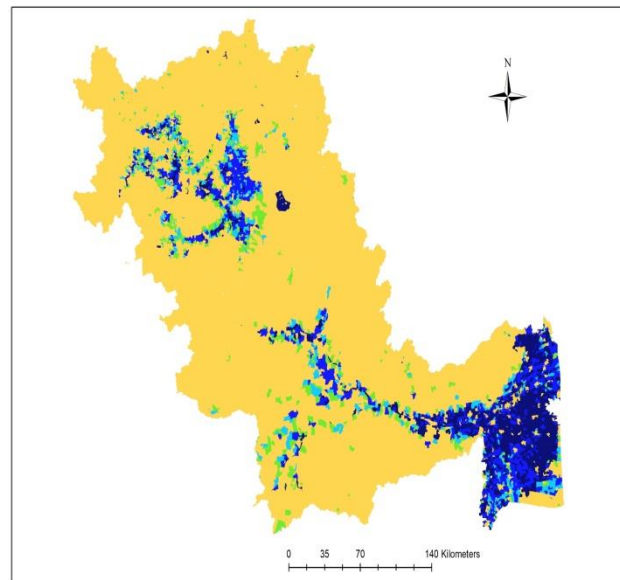
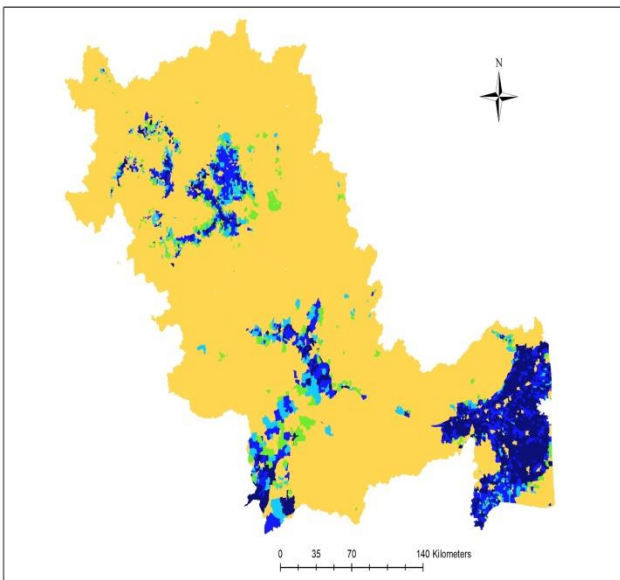
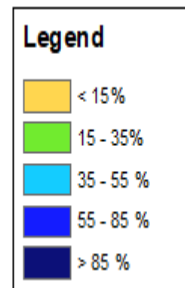


1991

2001

2011

Percentage of Surface water irrigated area to total cultivable area

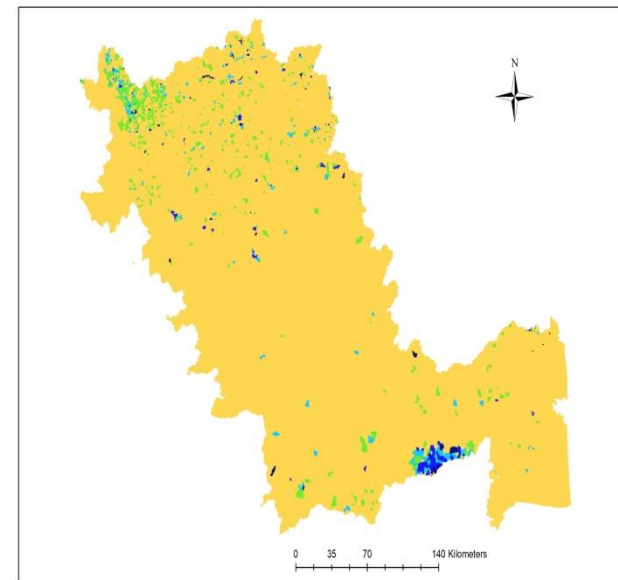
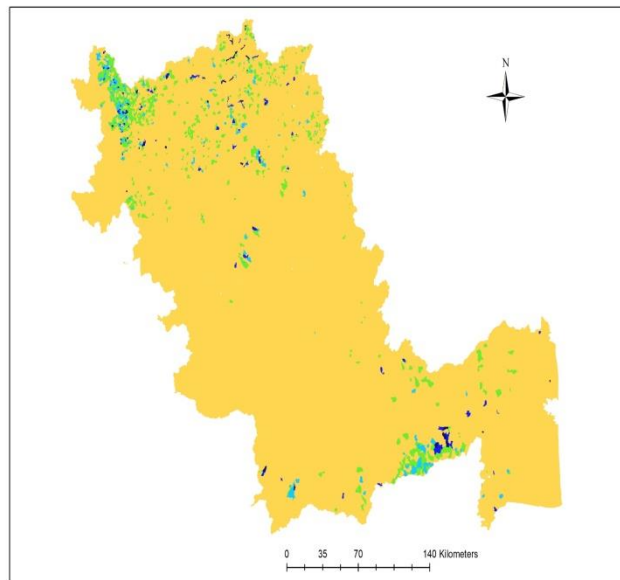
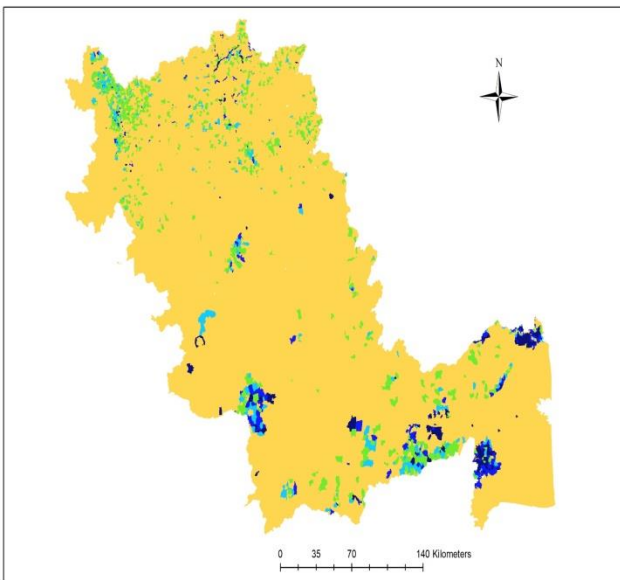
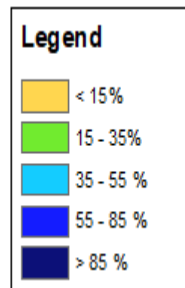


1991

2001

2011

Percentage of Tank system irrigated area to total cultivable area



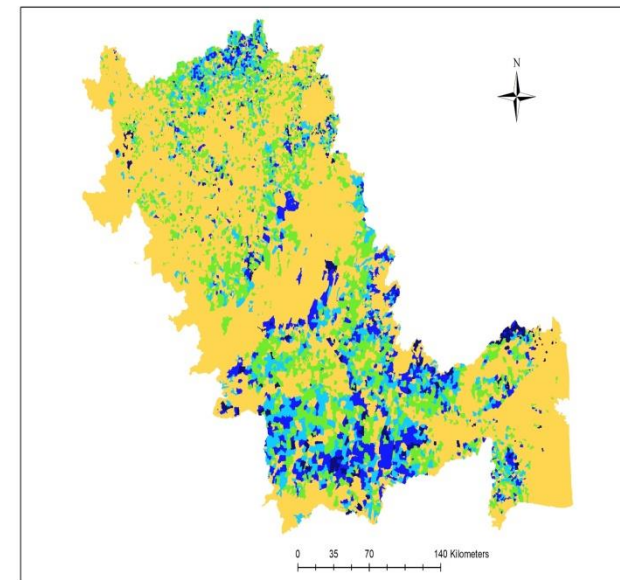
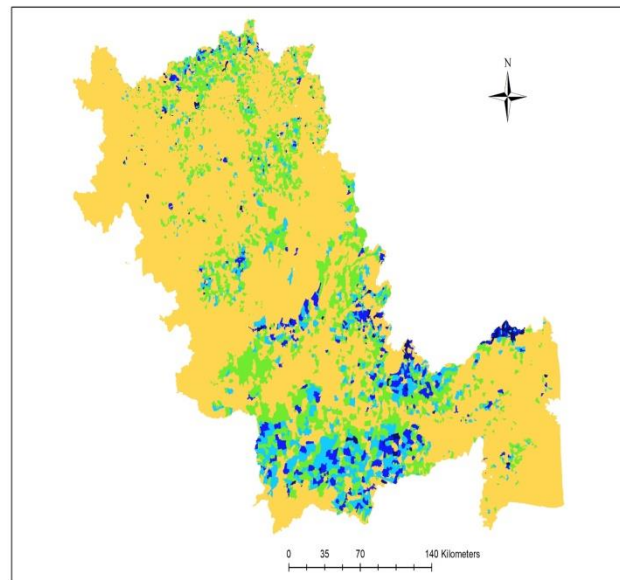
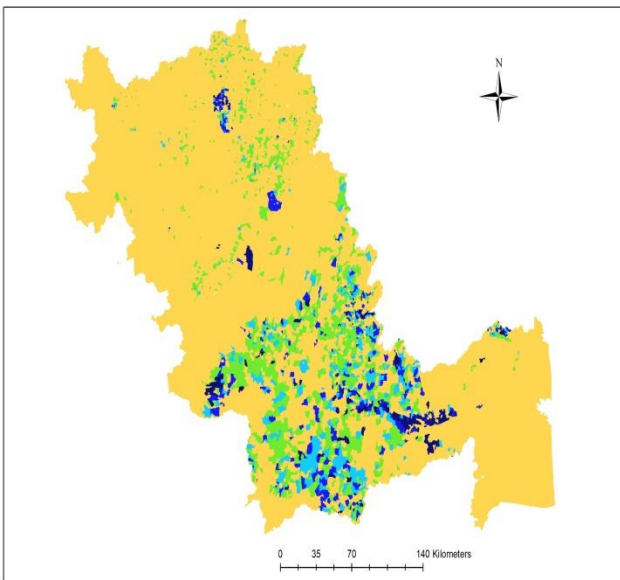
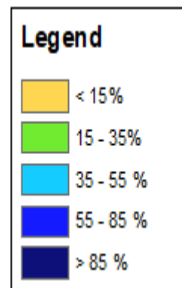


1991

2001

2011

Percentage of groundwater irrigated area to total cultivable area



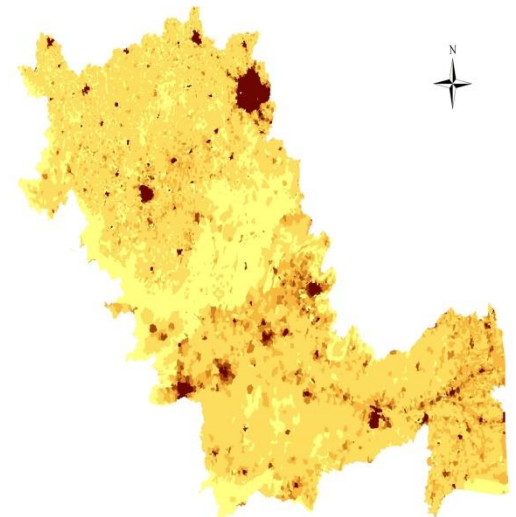
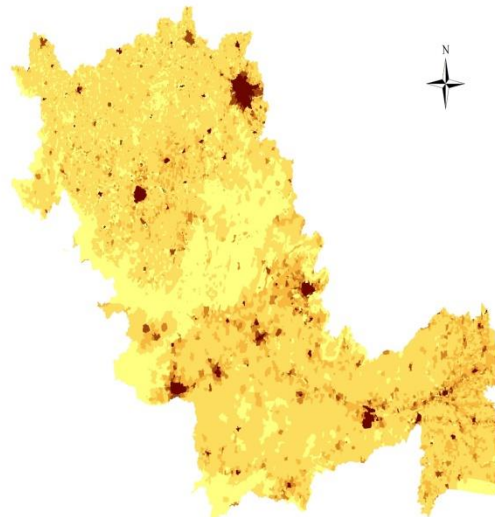
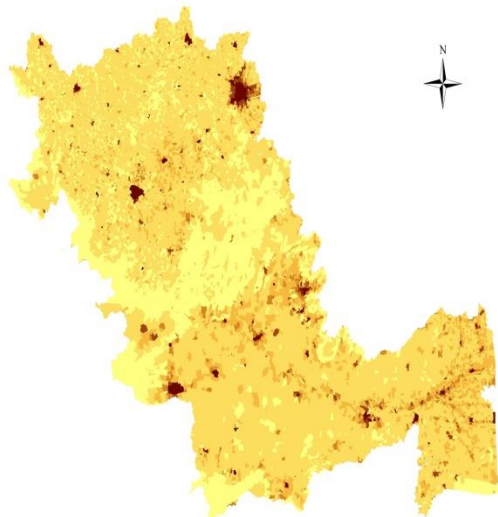
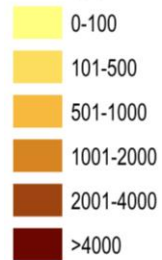
1991

2001

2011

## Population density map Census, India

### Legend Density (Person/km)

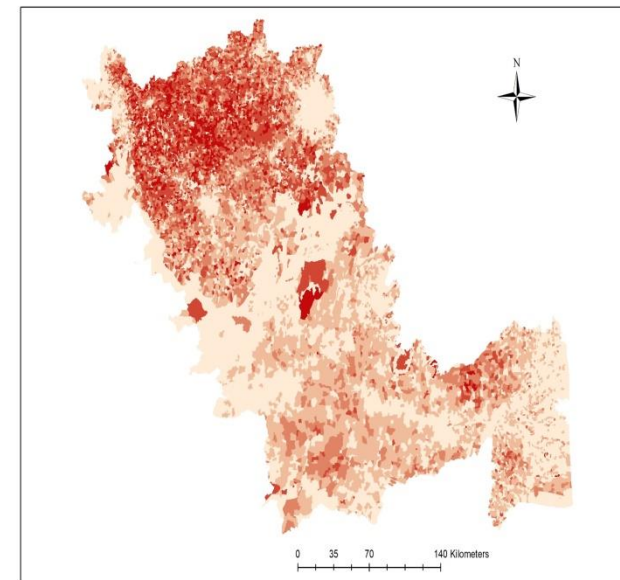
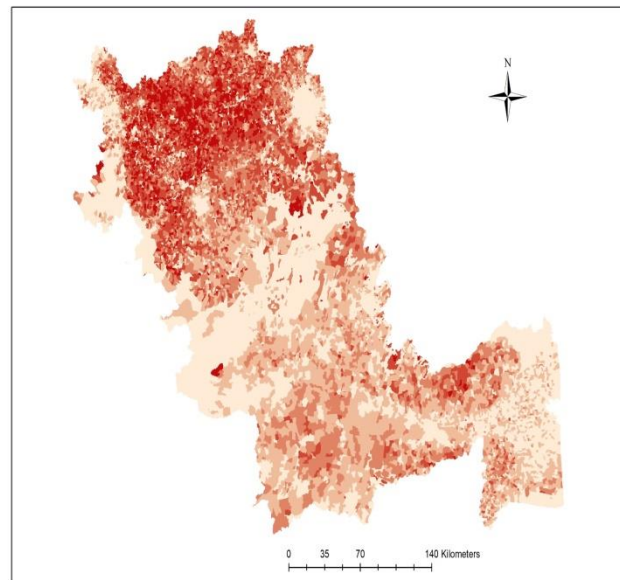
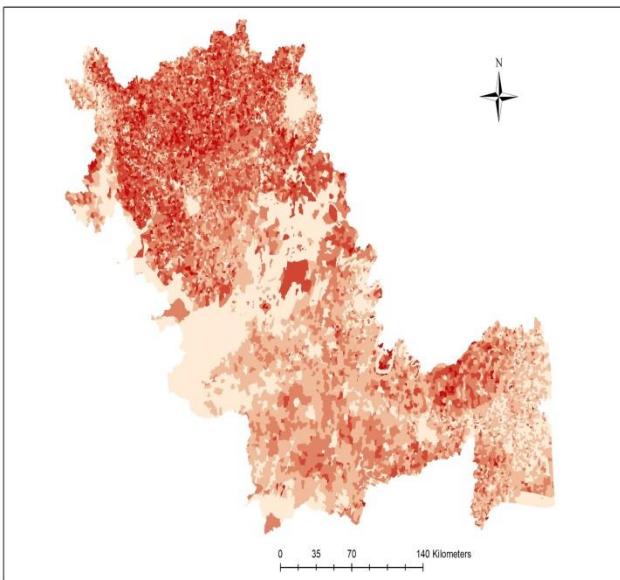
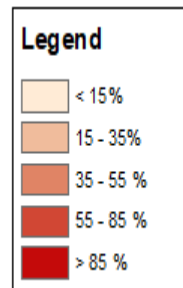


1991

2001

2011

Percentage of land owners (farmers) to total worker population



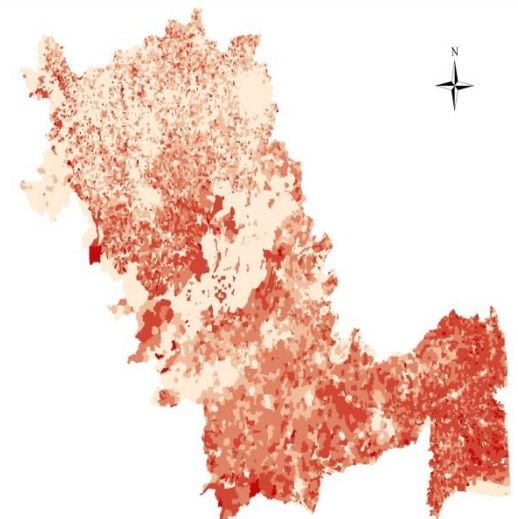
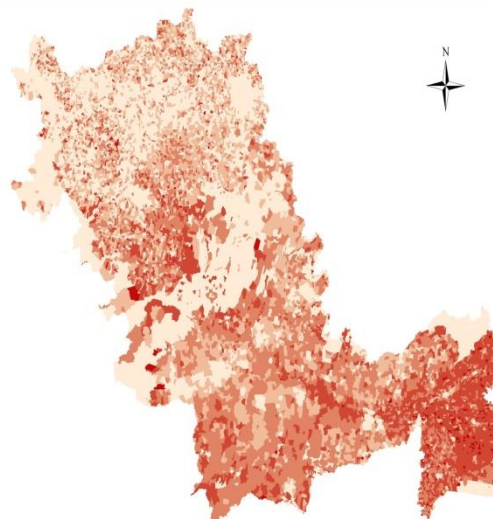
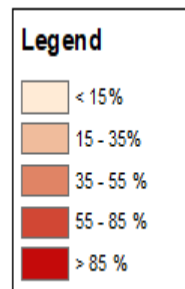


1991

2001

2011

## Percentage of farm labourers to total worker population

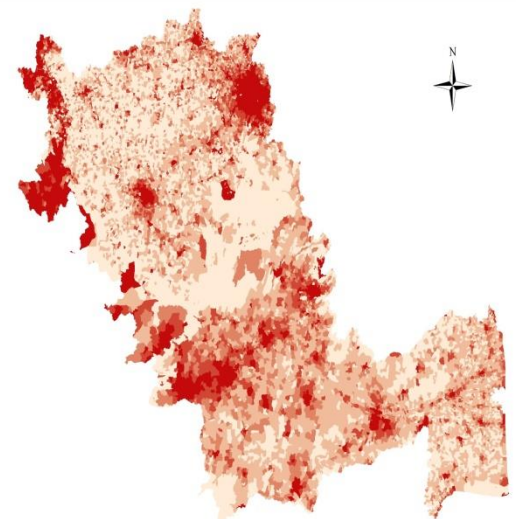
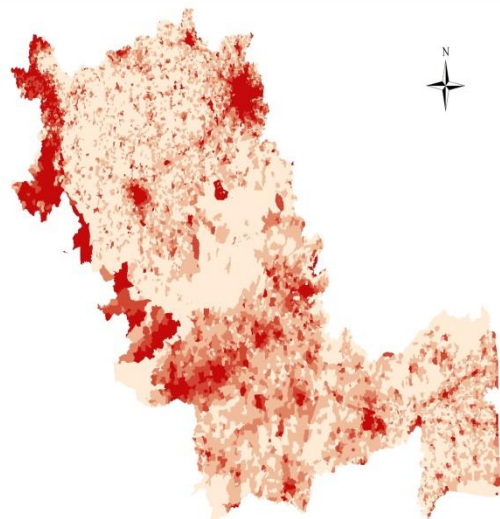
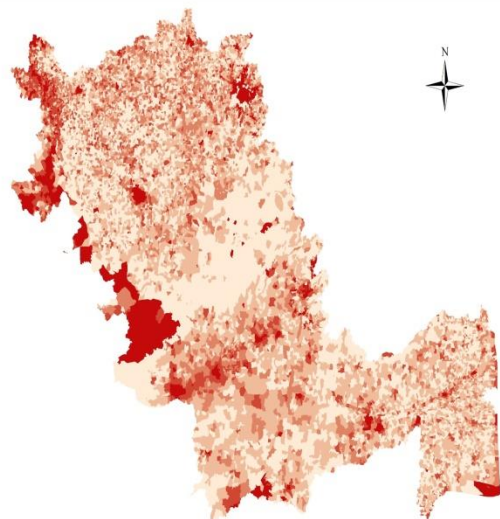
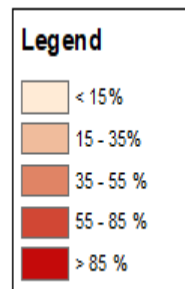


1991

2001

2011

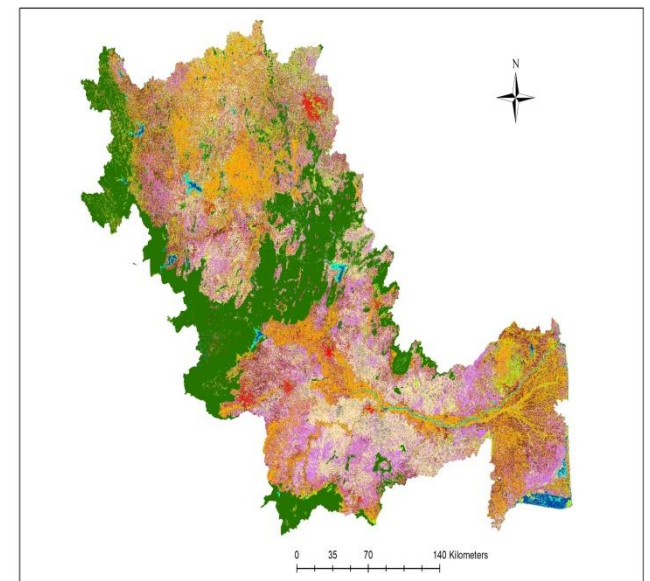
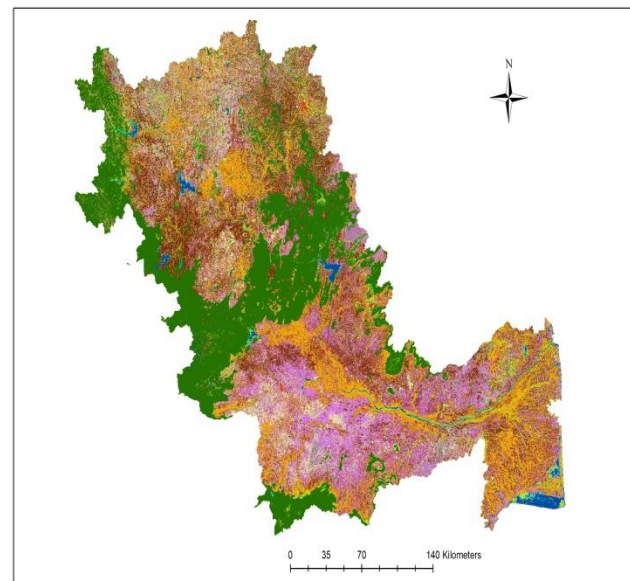
Percentage of Non-farm workers to total worker population



1991

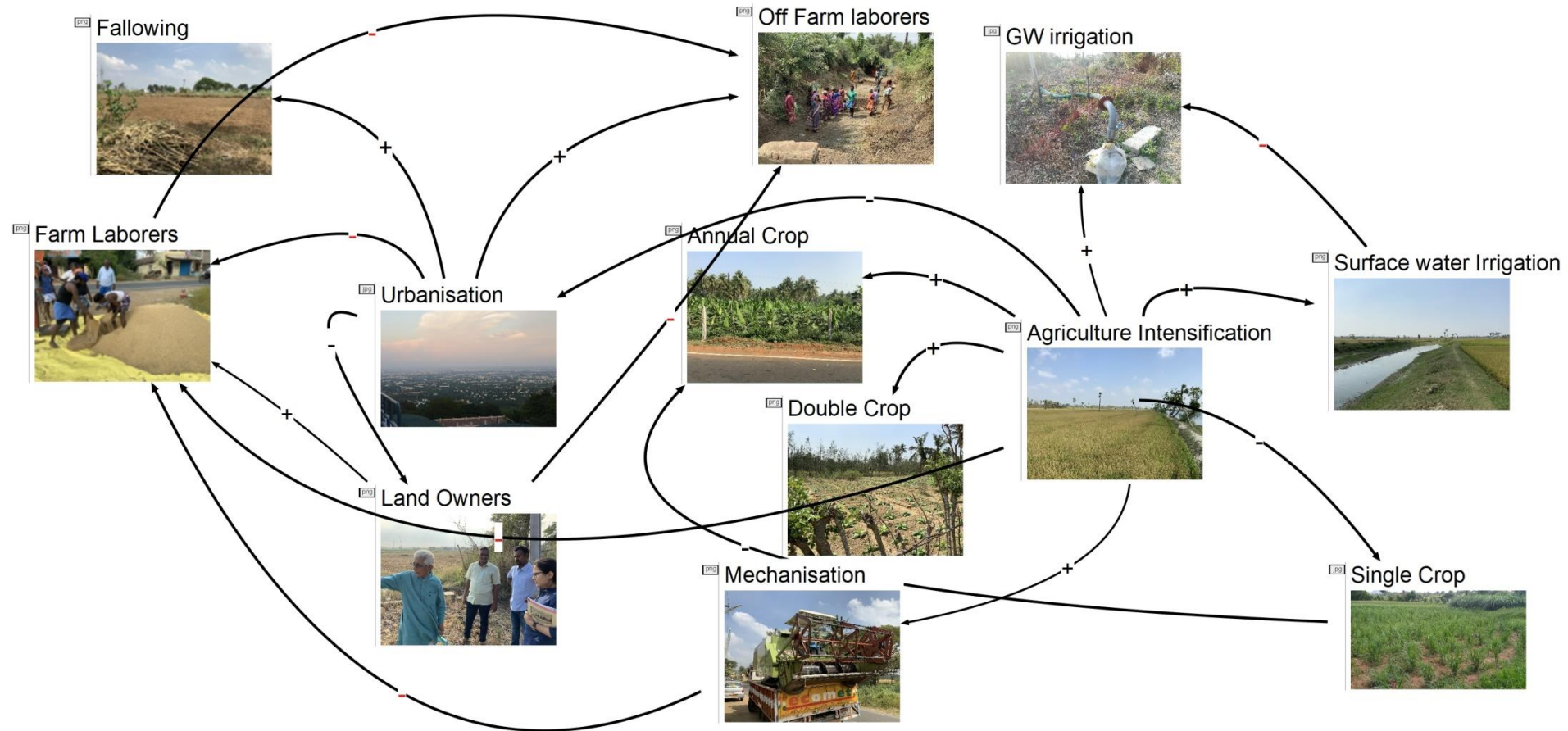
2011

LULC map (Shinde et al., 2020)





# Complex web of interactions



# Key messages

- Landscapes co-evolve organically with humans
- Drivers of conflict are interrelated
- Many typologies of water-conflict emerged at multiple at scale
- Therefore, its important to understand the conflict at watershed scale (nested straining of conflict)
- ‘Laws swim on sea of ethics’ – need to invoke value based thinking (forward looking approach) in hydrology and law

# THANK YOU



Socio-Hydrology lab

# ACKNOWLEDGEMENTS



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**Centre for  
Ecology & Hydrology**

NATURAL ENVIRONMENT RESEARCH COUNCIL



**British  
Geological Survey**

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MINISTRY OF  
EARTH SCIENCES

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