

Analyzing Challenges of Irrigation Systems in Nepal from Socio-Ecological System Framework

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Presentation Agenda

- Background
- Research Need
- Research Question
- Methodology
- Analytical Framework
- Result
- Conclusion



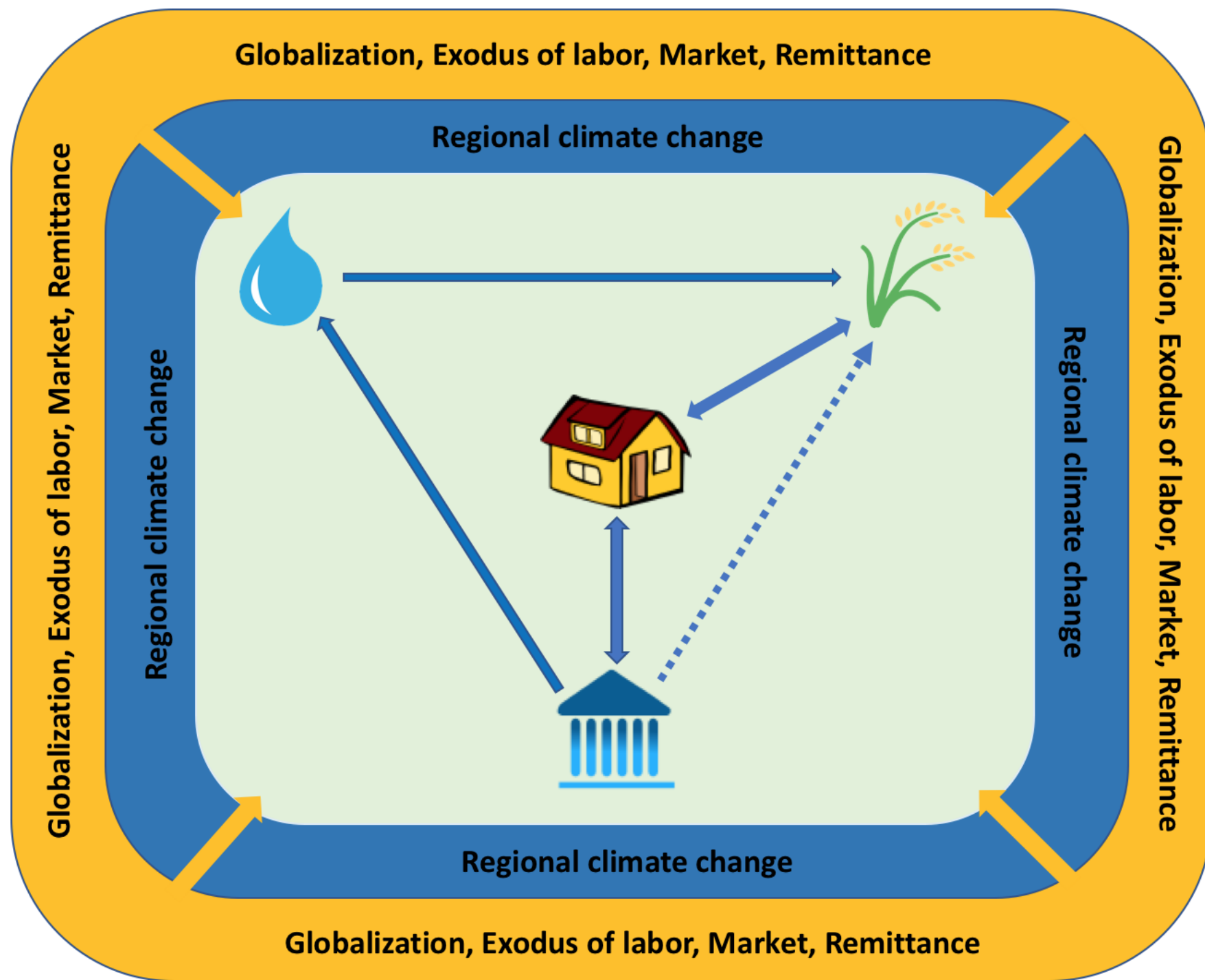
Background: FMIS

- Collective action
- Credited for enriching social capital
- Covers nearly 3/4 of irrigated area
- Exemplify both CPR (Ostrom, 1990) and SES (Anderies, Janssen & Ostrom, 2004; Ostrom, 2009; Ostrom et al., 2011)
- Consists of resources, infrastructure, actors and a governance structure
- Have higher performance



Research Need

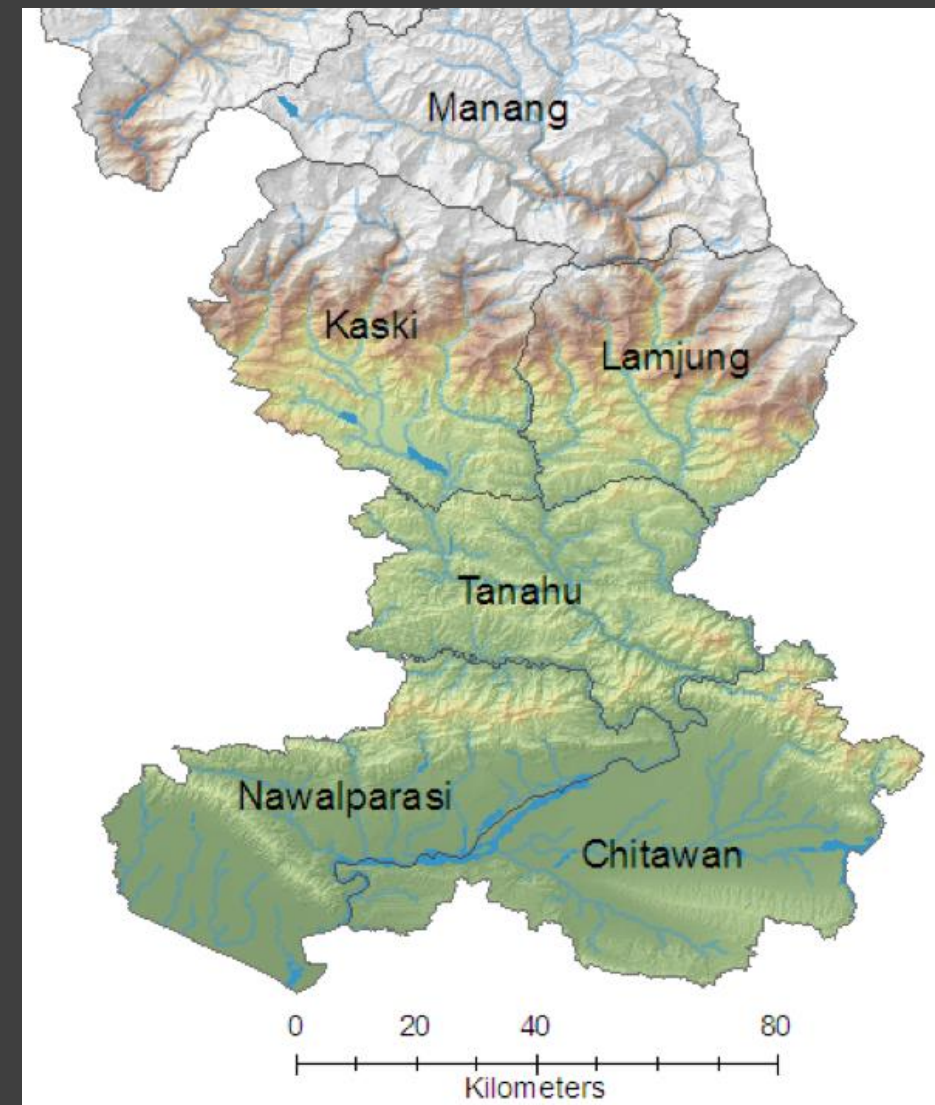
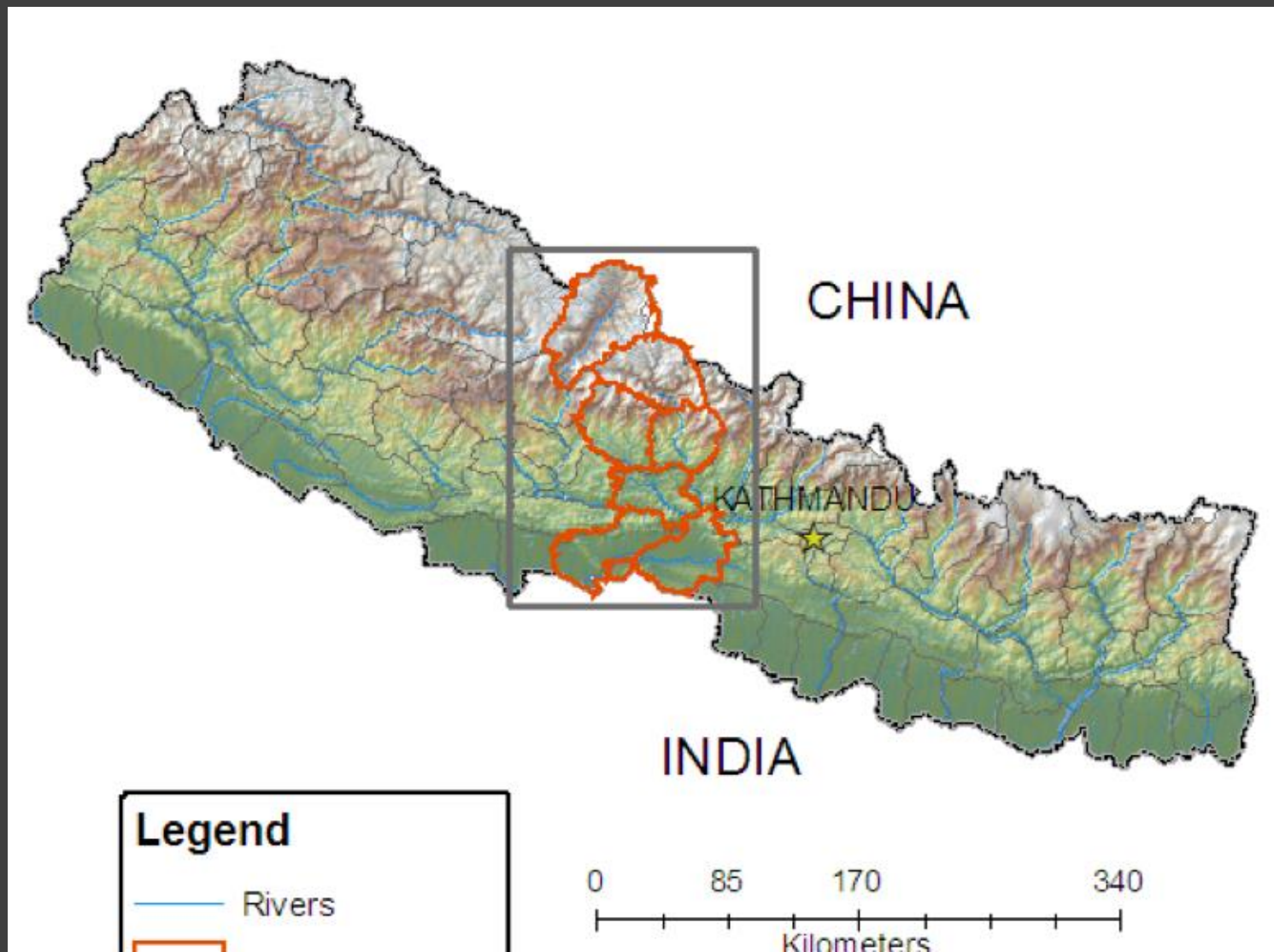
- Cross scale changes are affecting FMIS
- FMIS has been slow to respond to these disturbances



Research Questions

What are major challenges of irrigation systems in Nepal?

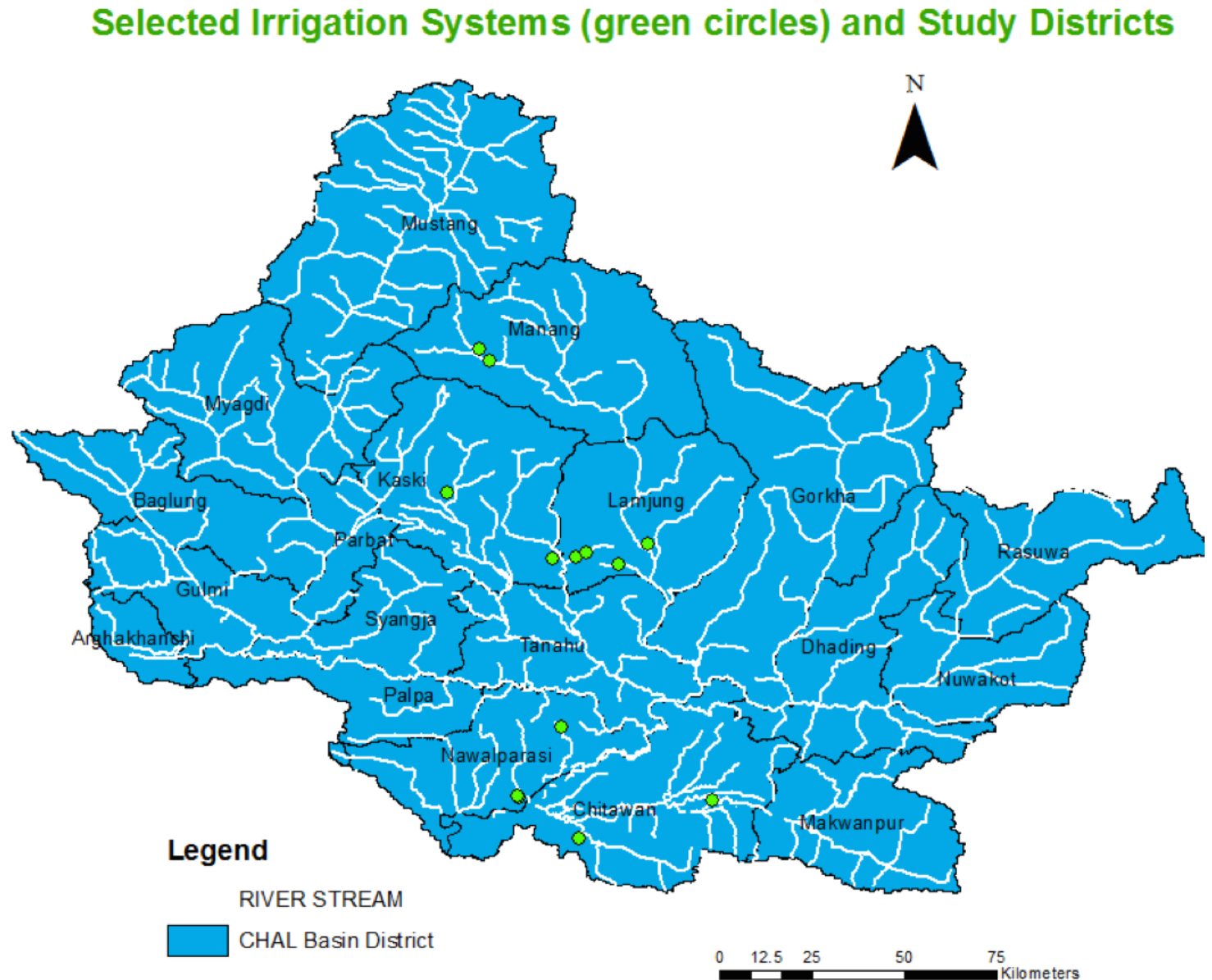
How do these challenges differ by agro-ecological regions?



Research Site

Selected Systems and Rationale of Selection

- Ecological region
- North-South linkage (Gandaki River Basin)
- Representative geography
- Economic & social structure
- Difference in governance
- Access to water
- Size of irrigation system

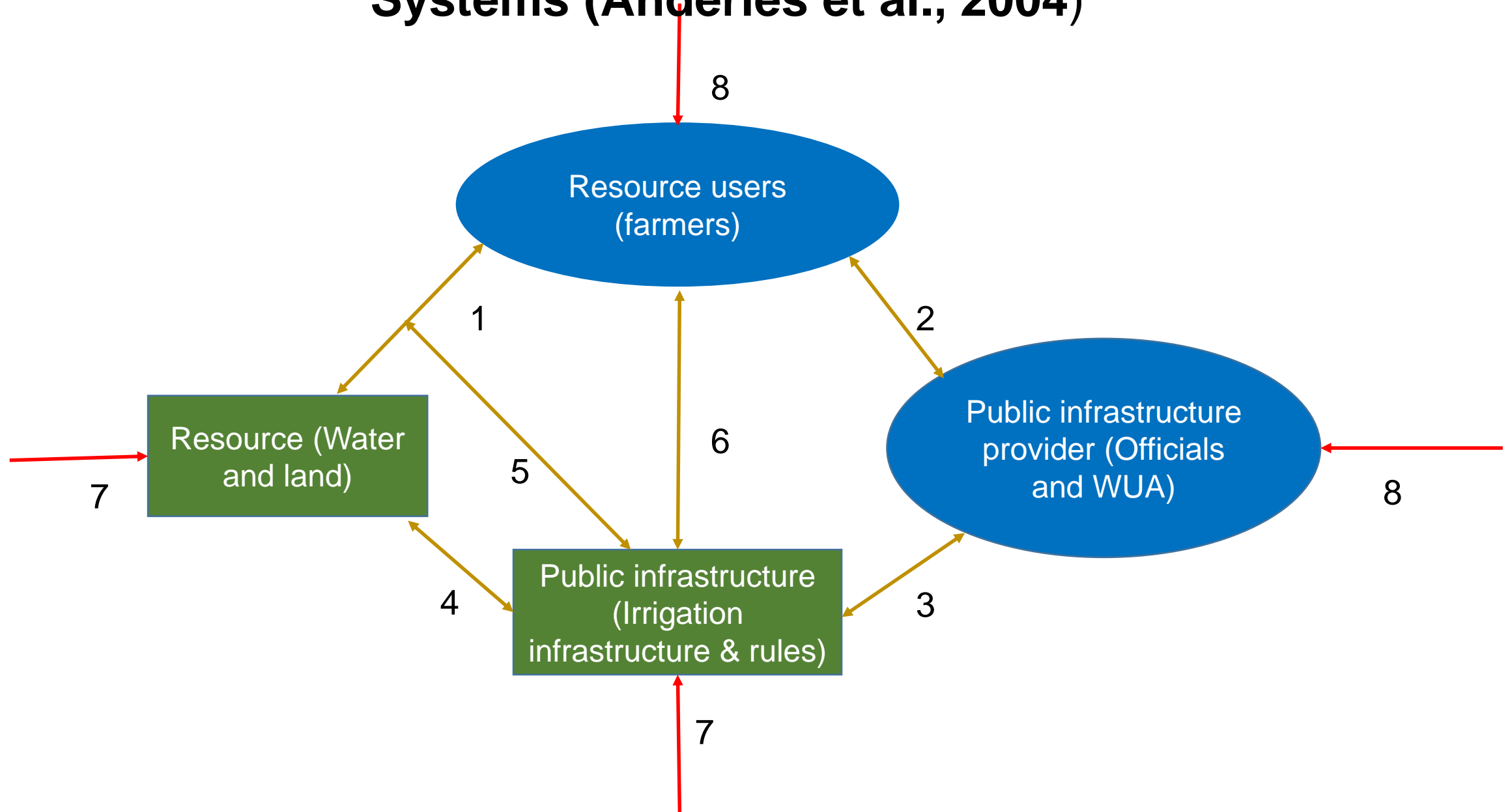


Research Methods

- **Primary source**
 - Observation of irrigation system
 - Key Informant Interview (KII)
 - Focus Group Discussion (FGD)
 - Bylaws and meeting minutes
- **Secondary source**
 - Climatic data
 - Demographic data
 - Remittance data



Analytical Framework: Robustness Framework for Small Irrigation Systems (Anderies et al., 2004)



Result

Inefficient infrastructure (leakage, seepage, muddy, temporary dam) (F=31)

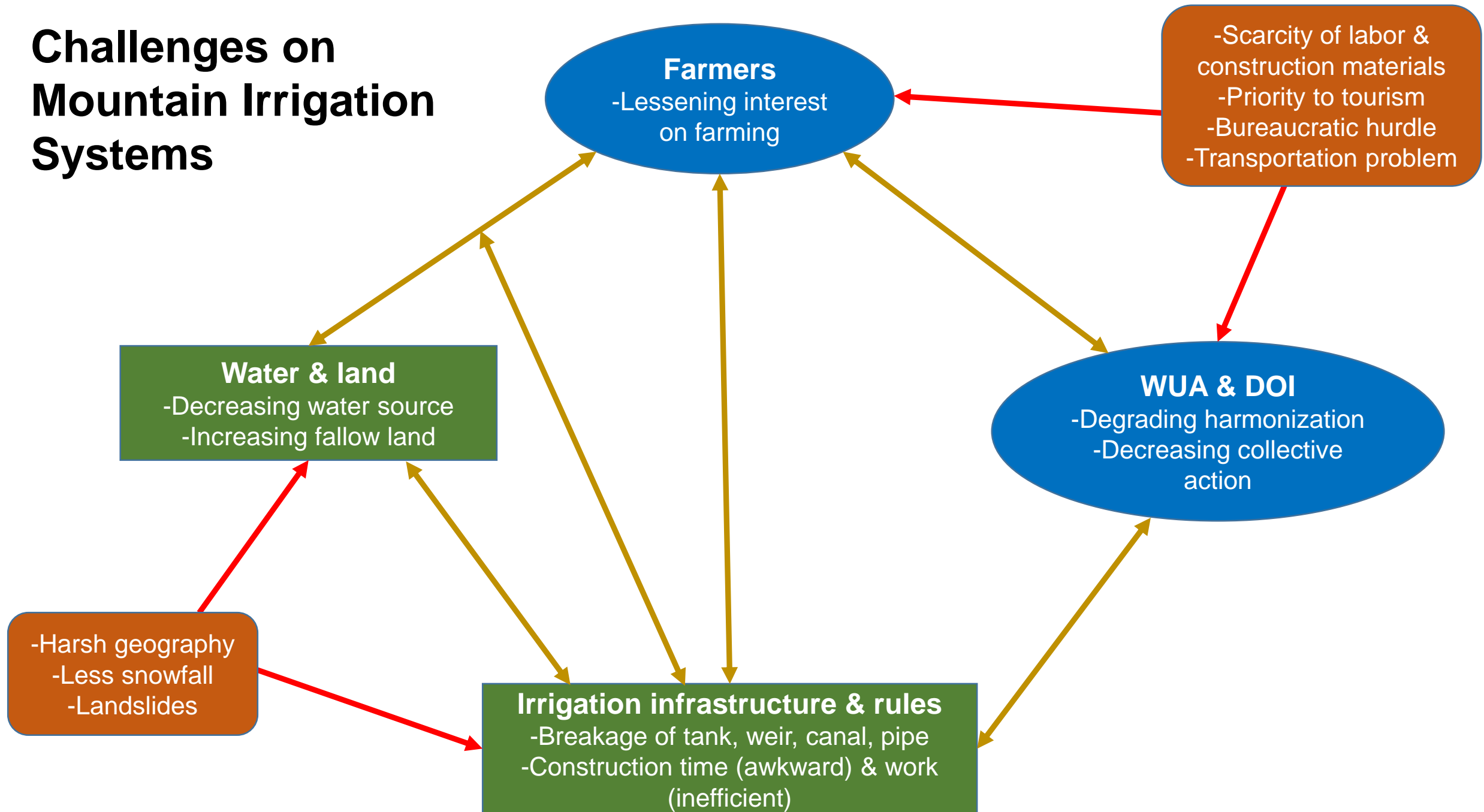
Decreasing and unequal distribution of water (F=23)

Outmigration of youth and labor scarcity (F=22)

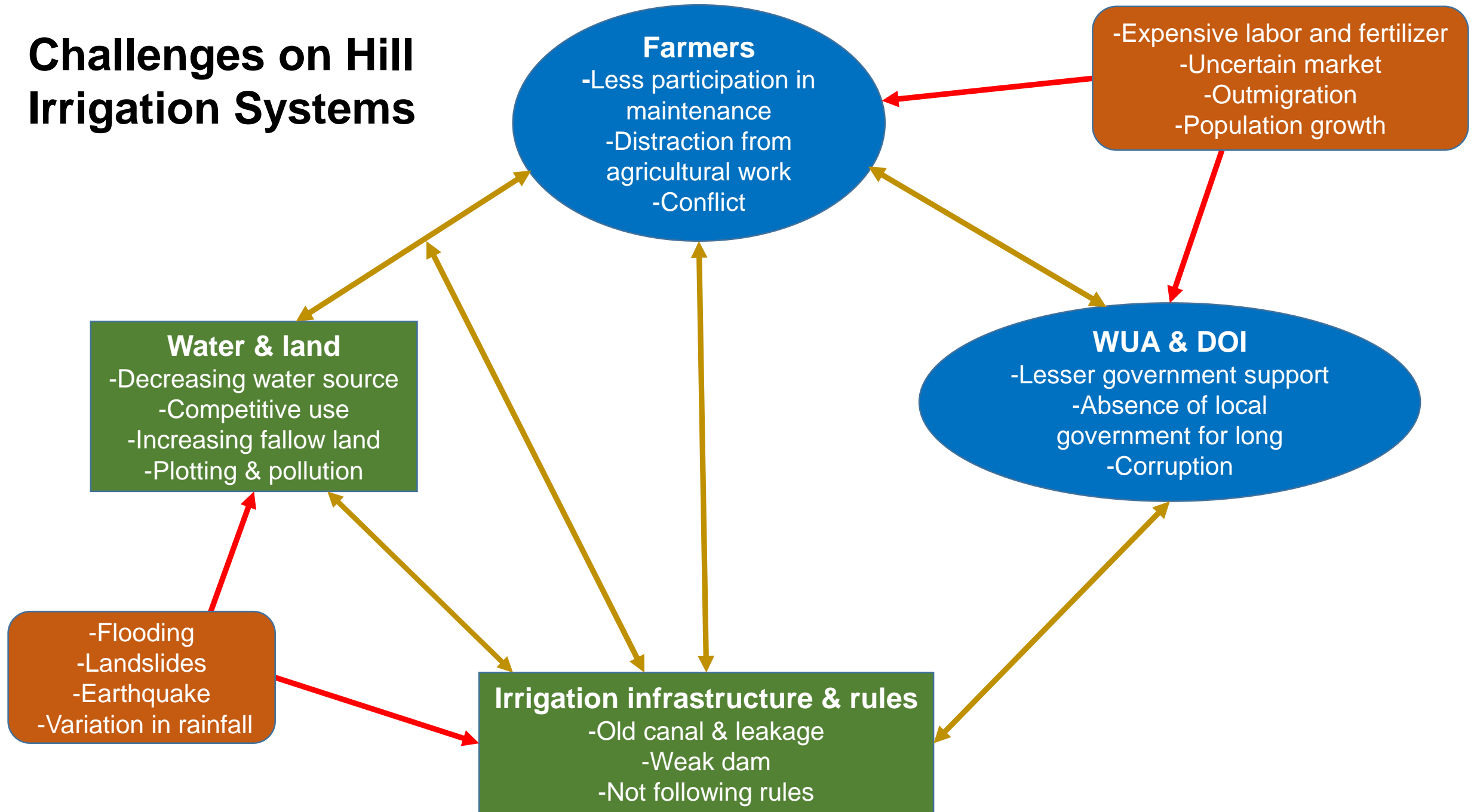
Degrading collective action (F=19)

Natural disasters (landslides, flooding, earthquake) (F=17)

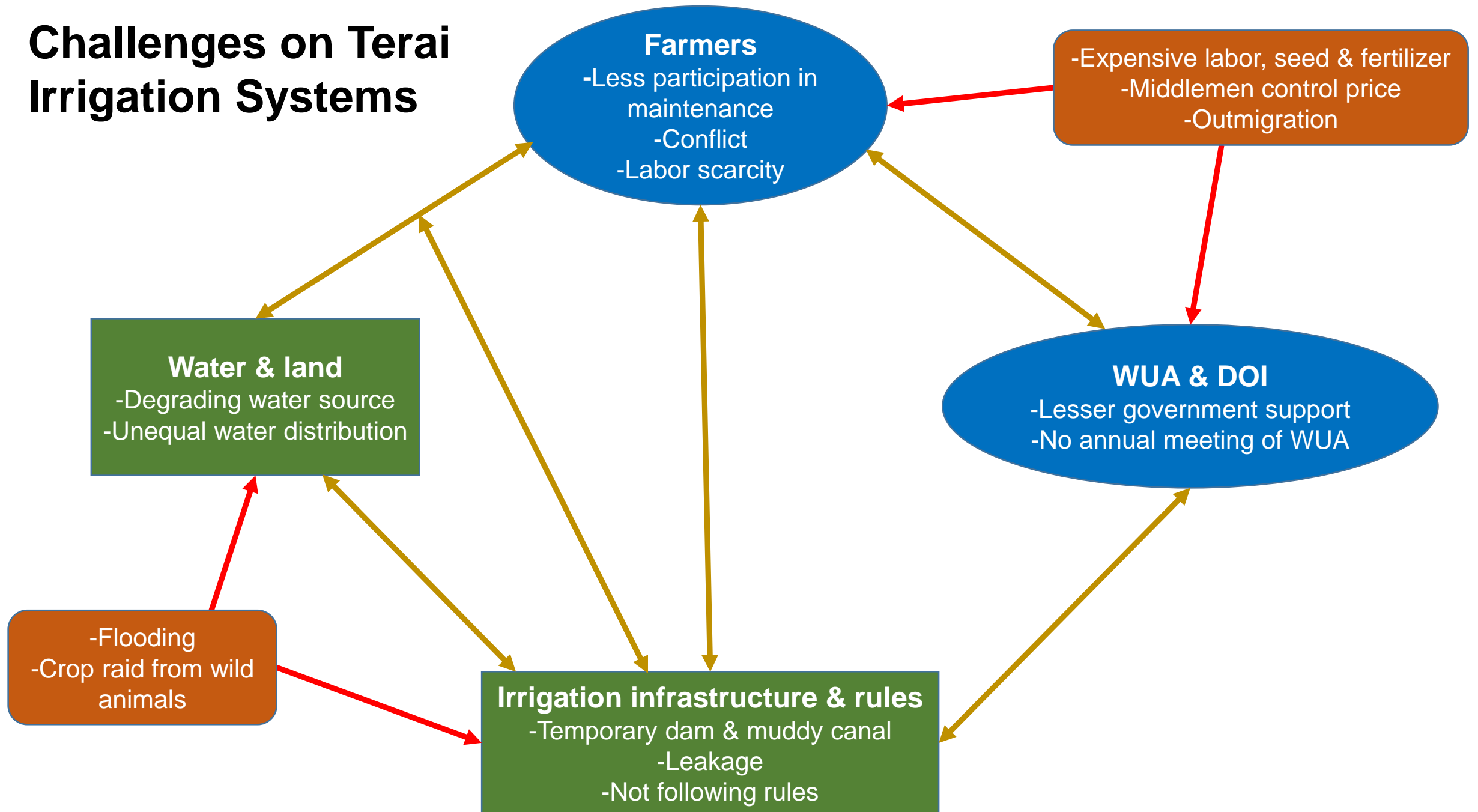
Challenges on Mountain Irrigation Systems



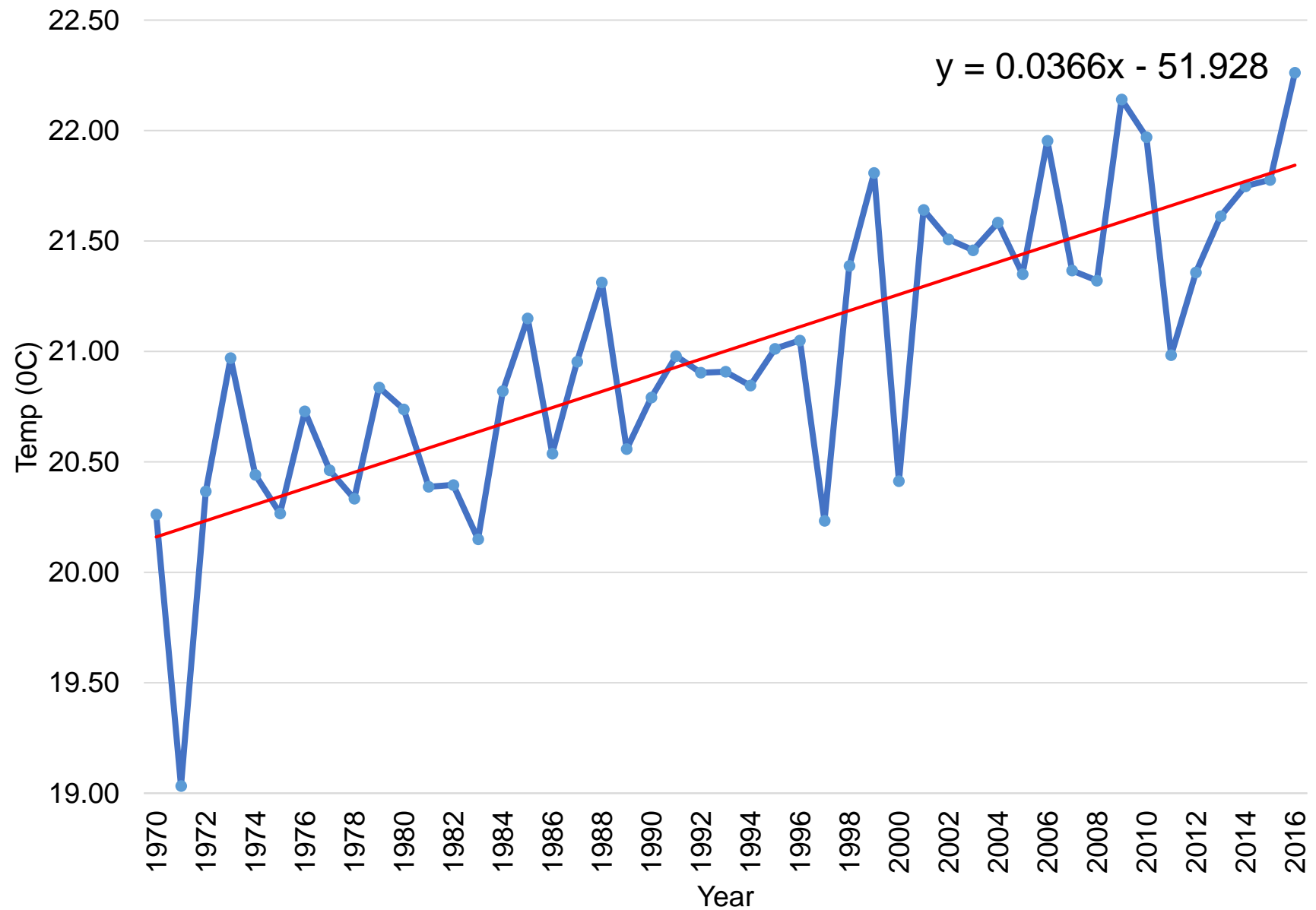
Challenges on Hill Irrigation Systems



Challenges on Terai Irrigation Systems

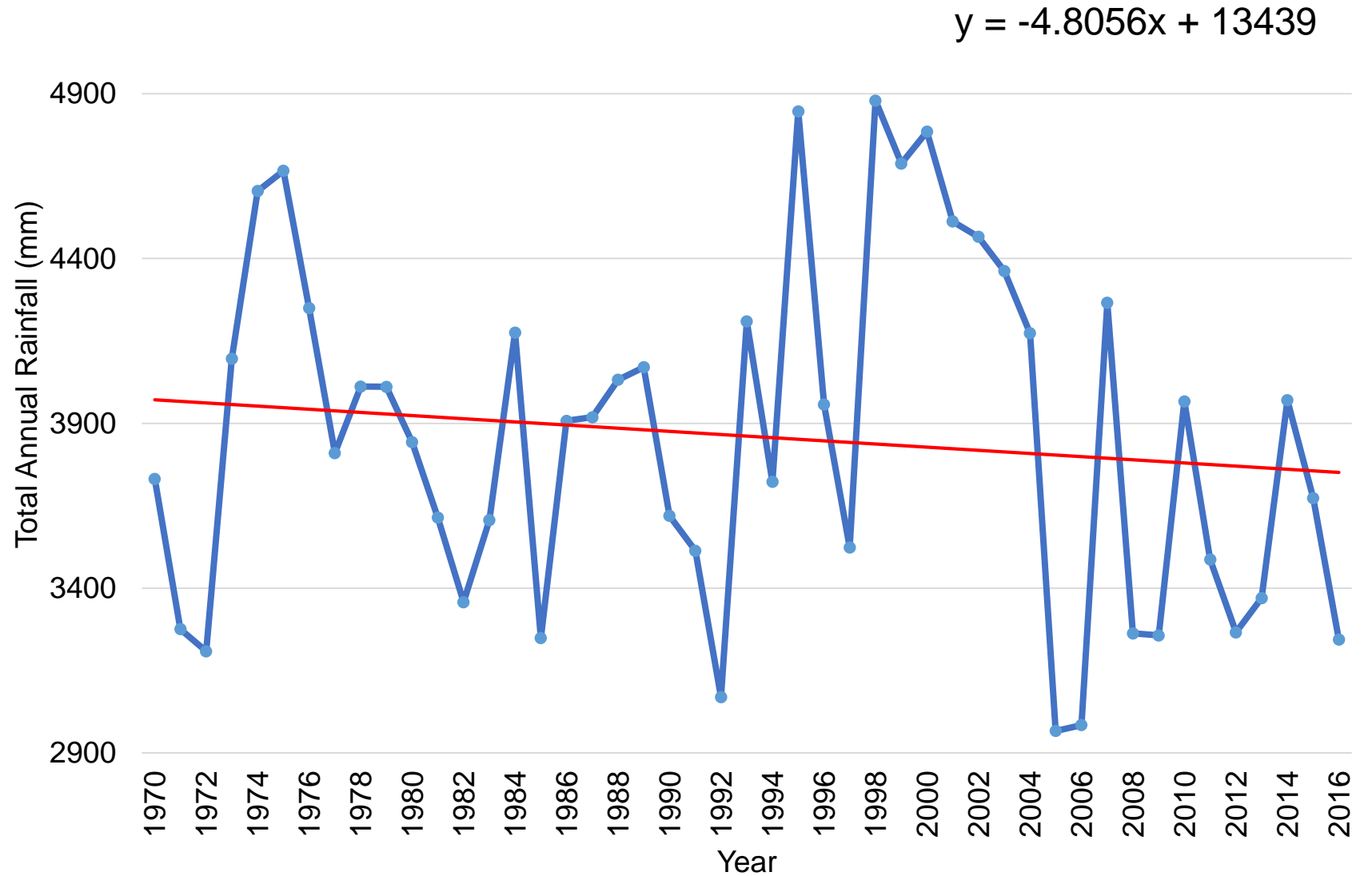


Temperature
increasing



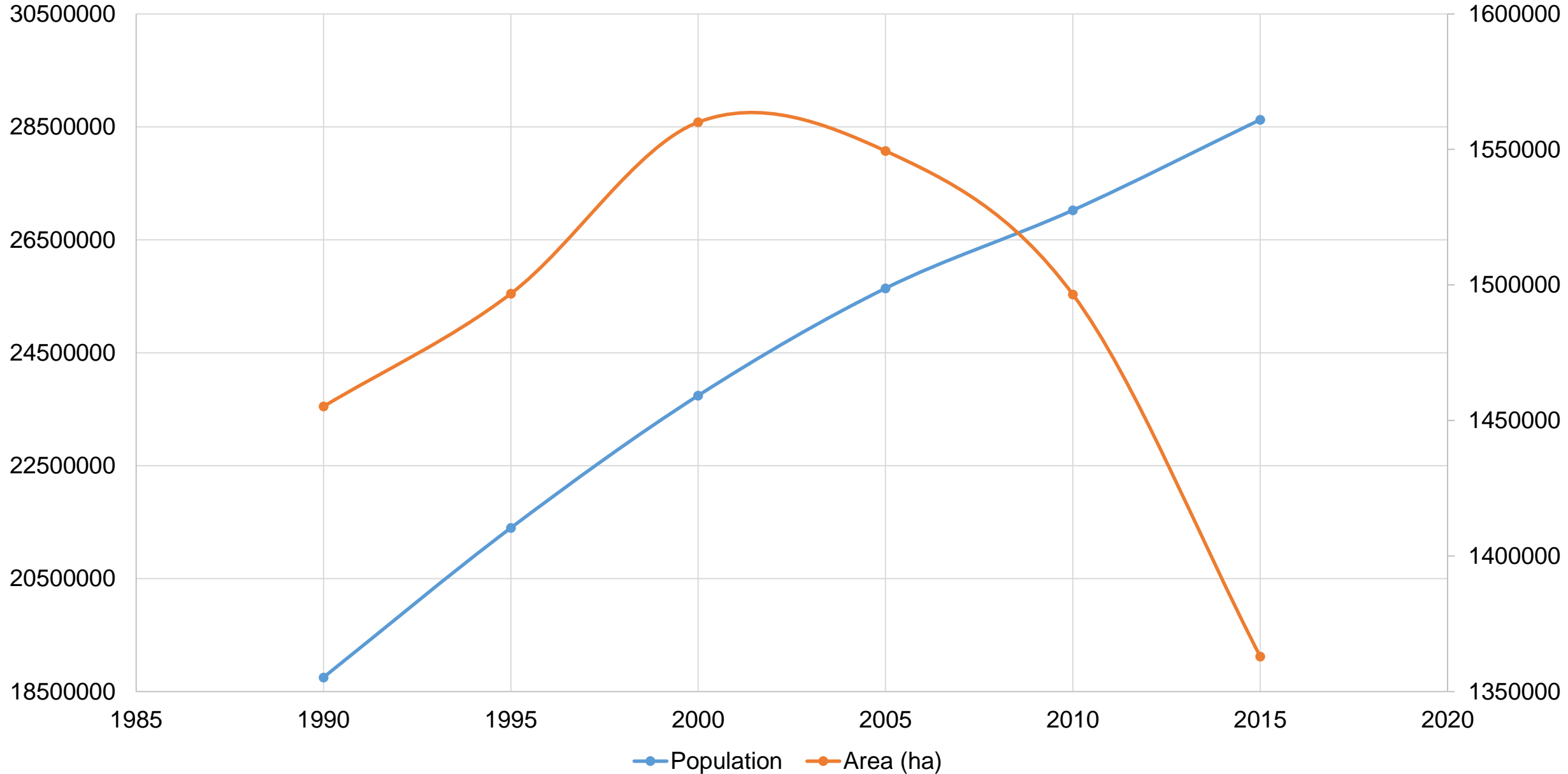
Average Annual Temp (Pokhara, Kaski)
(Source: GoN, Department of Hydrology and Meteorology, 2017)

Rainfall
decreasing



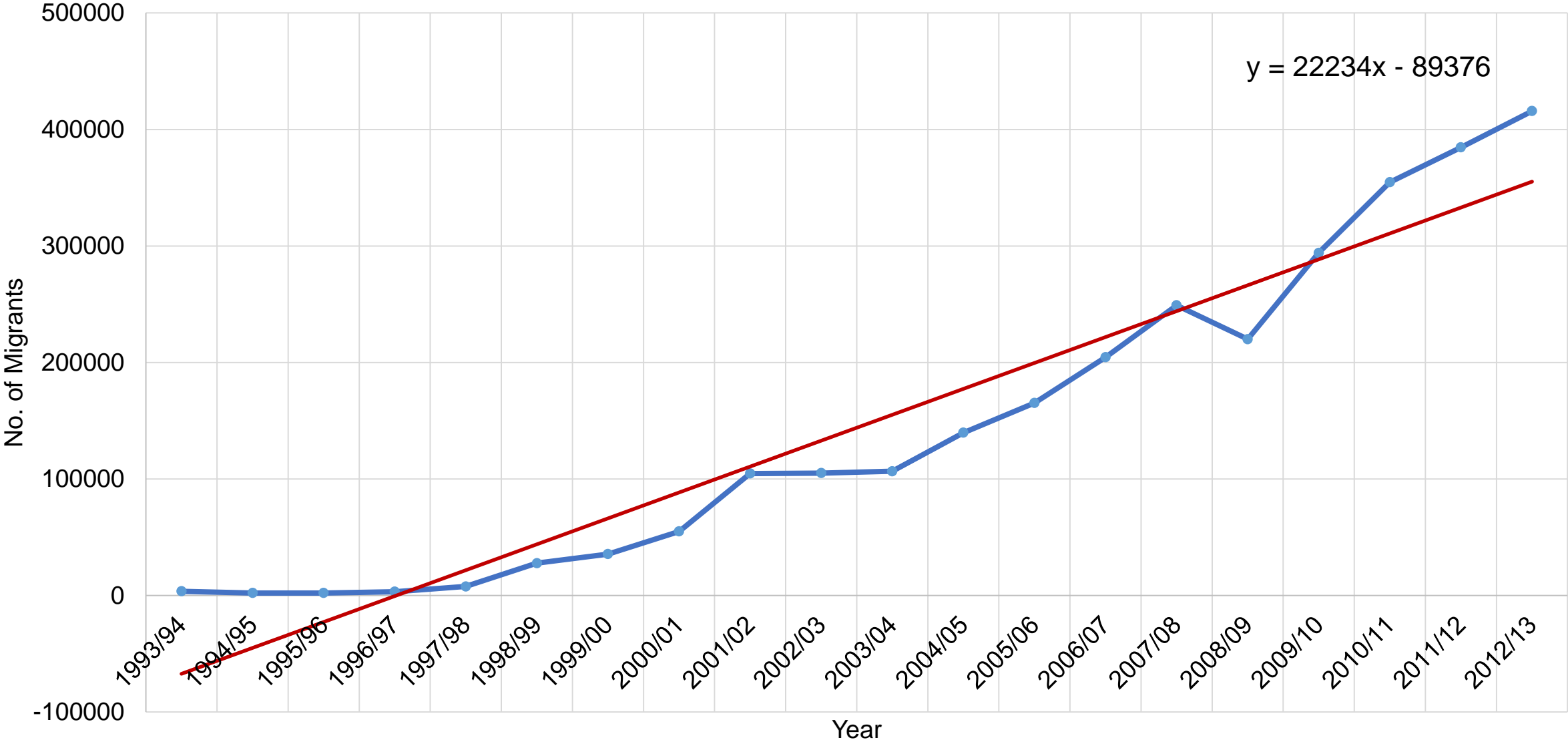
Annual Total Rainfall (Pokhara, Kaski)
(Source: GoN, Department of Hydrology and Meteorology, 2017)

Changing trend of population and rice cultivation area



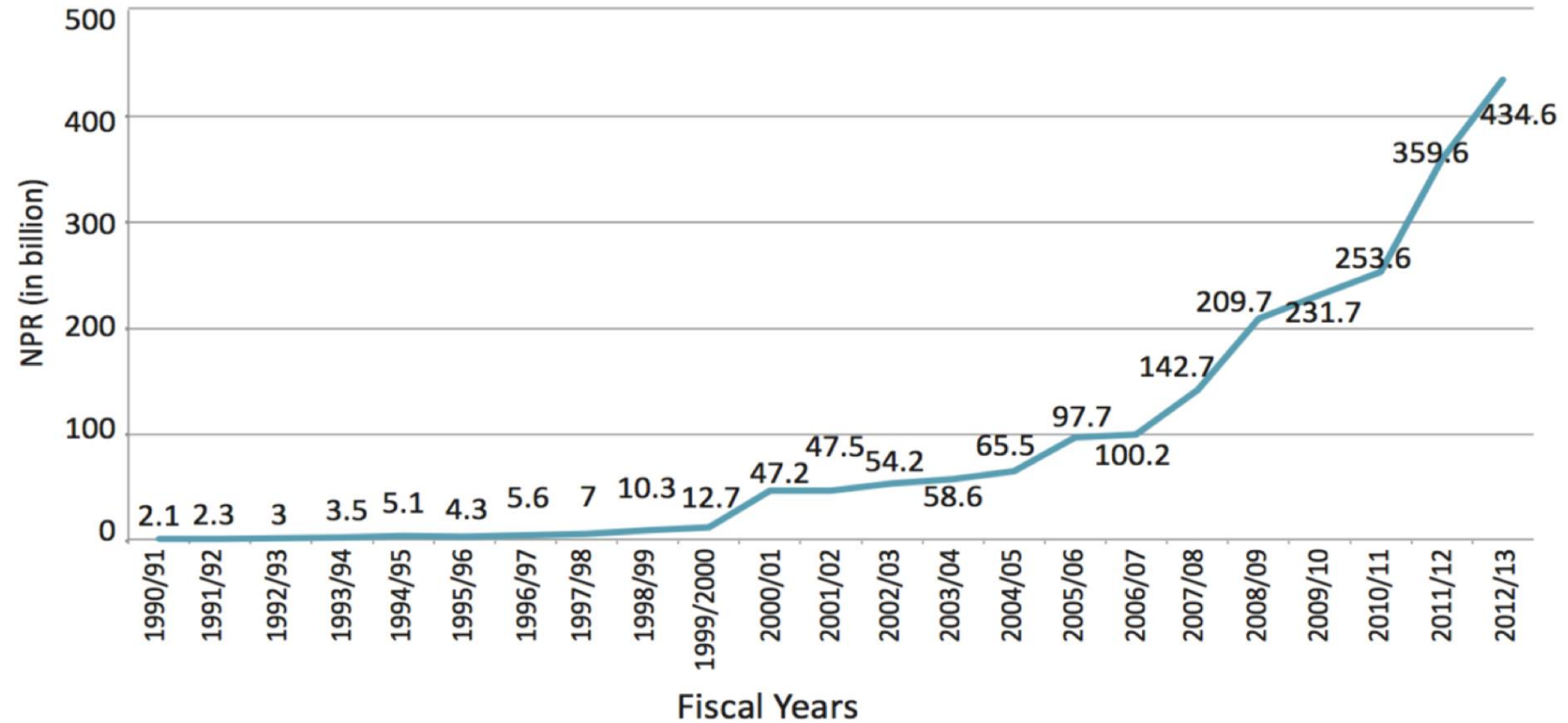
Source: The World Bank, 2018 and GoN, Ministry of Agricultural Development, 2017

Exodus of labor force



No. of work permit issued to work in foreign country
(Source: GoN, Department of Foreign Employment, 2017)

Remittance
economy
replacing
agriculture
based
economy



Workers' Remittances (in billion NPR)
(Source: Sharma et al., 2014)

- Challenges deviated farmer's attention from traditional agriculture to other sectors
- The huge earthquake of 2015 demanded labor for reconstruction work
- Nepali farmer can't compete with Indian farmer
- Significantly impacted collective action



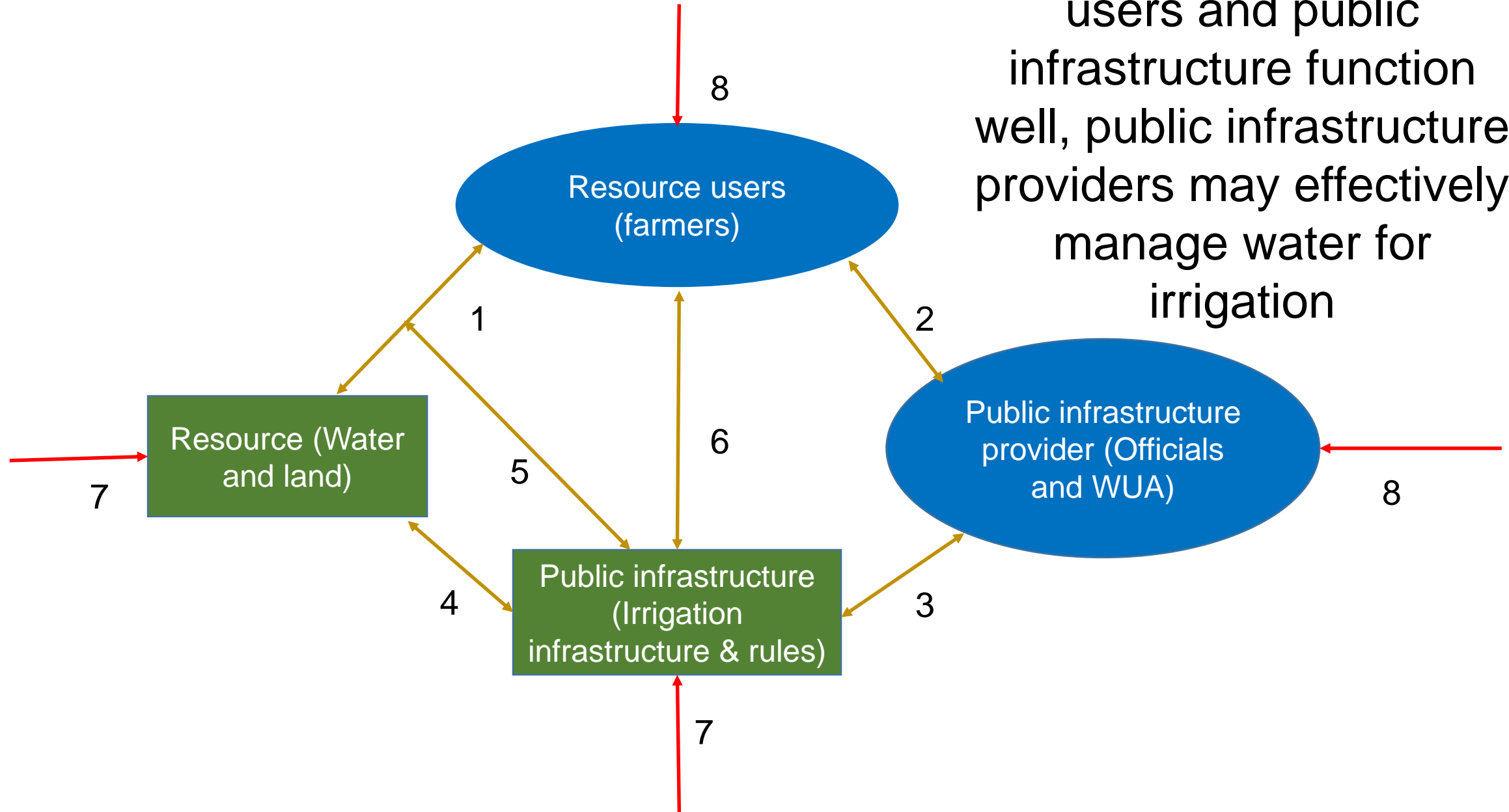
Conclusion (major challenges)

- **Resource:** Decreasing and unequal distribution of water
- **Resource users:** Degrading collective action
- **Public infrastructure:** Inefficient infrastructure
- **External disturbances:** Outmigration, labor scarcity, natural disasters



Conclusion

If resource, resource users and public infrastructure function well, public infrastructure providers may effectively manage water for irrigation



Thank you

