Exploring water scarcity through the dynamics of social power: The case of the Thar Desert

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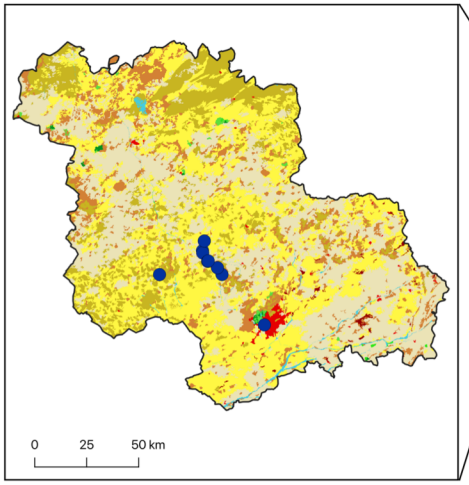
Introduction

- Globally, ***3.97 billion people experience water scarcity*** at least one month every year.[1]
- ***By 2030, 700 million people worldwide could be displaced*** by intense water scarcity.[2]
- The Thar desert, the location of this study, is home to 23 million people, and is ***the most densely populated desert ecosystem in the world.***[3]
- It receives less than ***200 millimeters of rain*** in semi-arid regions annually.[3]
- Surveys and demographic indicators such as ***gender, caste, age, education, private or public water source, and community status*** were used to examine the experience of living in a water scarce environment.

Results



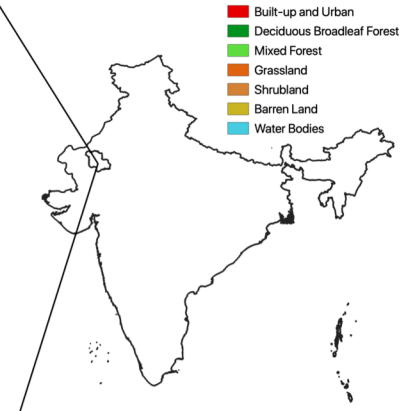


Figure 1: Land use map of Jodhpur, India. Blue points are the location of respondents. Land use data was obtained from [4].

Methods

- ***Individual/group interviews*** (n=8) were conducted in ***Hindi*** in Jodhpur, Rajasthan, India in 2018 (Fig 1).
- An interview guide was produced, but ***questions and content varied slightly based on the respondent's willingness to speak.***
- The amount of ***water consumed daily*** by each household, as well as ***specific demographic indicators*** (Table 1), were collected.
- Water consumption was measured by number of ***20 liter pots collected per day.***
- Water consumption was compared to demographic indicators using ***linear regression***.
- ***Additional interviews (n=6) of government and NGO employees*** were also conducted.

Experience of Social Hierarchies	**Experience of Education**
Men > Women	Illiteracy
Mother-in-law > Daughter in-law	Lack of content vocabulary
Children > Mother	Limited awareness of water rights
Experience Private Water Source	**Experience of Water Governance***
Increased leisure time	Lack of trust between state and village leaders
Decreased joint pain	Emptying of communal water storage as a result of political conflict
Increased water security	Lack of awareness of poor water quality and infrastructure
Experience of Caste	
Inability to use public water or sanitation infrastructure	
Subsidized private water infrastructure	

Table 1: Summarized results of individual/group interviews about the impact of demographics on the experience of water scarcity (n =8).
* Water governance data collected from interviews with government officials and NGO employees (n=6).

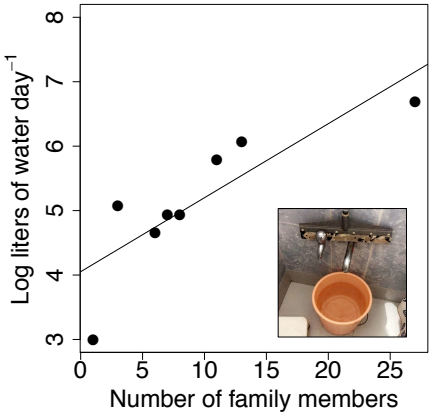


Figure 2: Linear regression of log-transformed water use and family size. Data points are individual interviews or averages of group interviews (n=8).

Conclusion

- The ***number of family members*** was the only demographic indicator that had a significant effect on water consumption (Fig 2, $R^2 = 0.70$, $P = 0.009$).
- However, water scarcity was likely ***experienced differently*** at the family level due to the demographic factors (Table 1).
- ***Level of education*** was an important factor in the ability of respondents to engage with water scarcity issues (Table 1).
- Both ***scientific and social justice perspectives*** need to be used to find sustainable solutions to water scarcity issues in the developing world.

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