



Ecosystem Based Climate Change Vulnerability Assessment for Adaptation and Mitigation: A Mobile App Based Approach for Hotspots of Kerala State, India

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Introduction

- Climate change is the defining issue of our time and we are at a decisive moment
- 100 million people will be back to poverty in the world by 2030 without rapid, inclusive, climate-informed development
- Kerala, the Southernmost state of India, faces a myriad of climate change impacts on agriculture, human health, biodiversity, coastal areas and water availability in the recent years
- The state's unique geographical location, erratic weather patterns, high population density, rapid urbanisation, environmental degradation along with climate change compound the vulnerability condition

Material & Methods

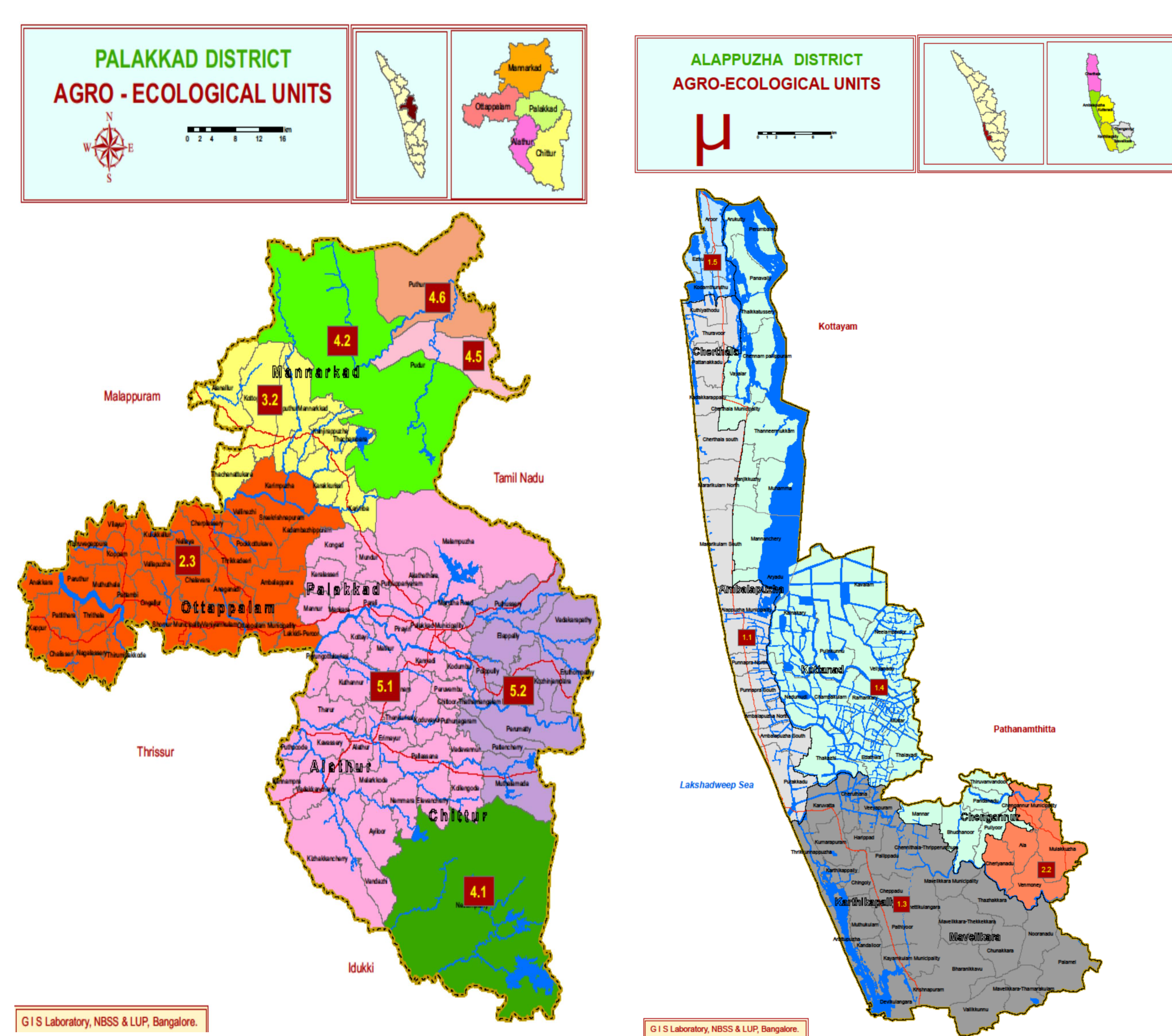


Fig 1. Map of the study area

- Study area: 13 Agroecological zones, Kerala
- Tools: An open data mobile application tool kit for data collection
- Sampling: Multistage cluster sampling
- Sample size: 5000

Climate Vulnerability Index (CVI)

- Theory driven and deductive
- Location specific indicators
- Standardisation of subcomponents
- Balanced weighted approach

$$CVI = \frac{\sum_{i=1}^{10} W_{mi} M_{wi}}{\sum_{i=1}^{10} W_{mi}}$$

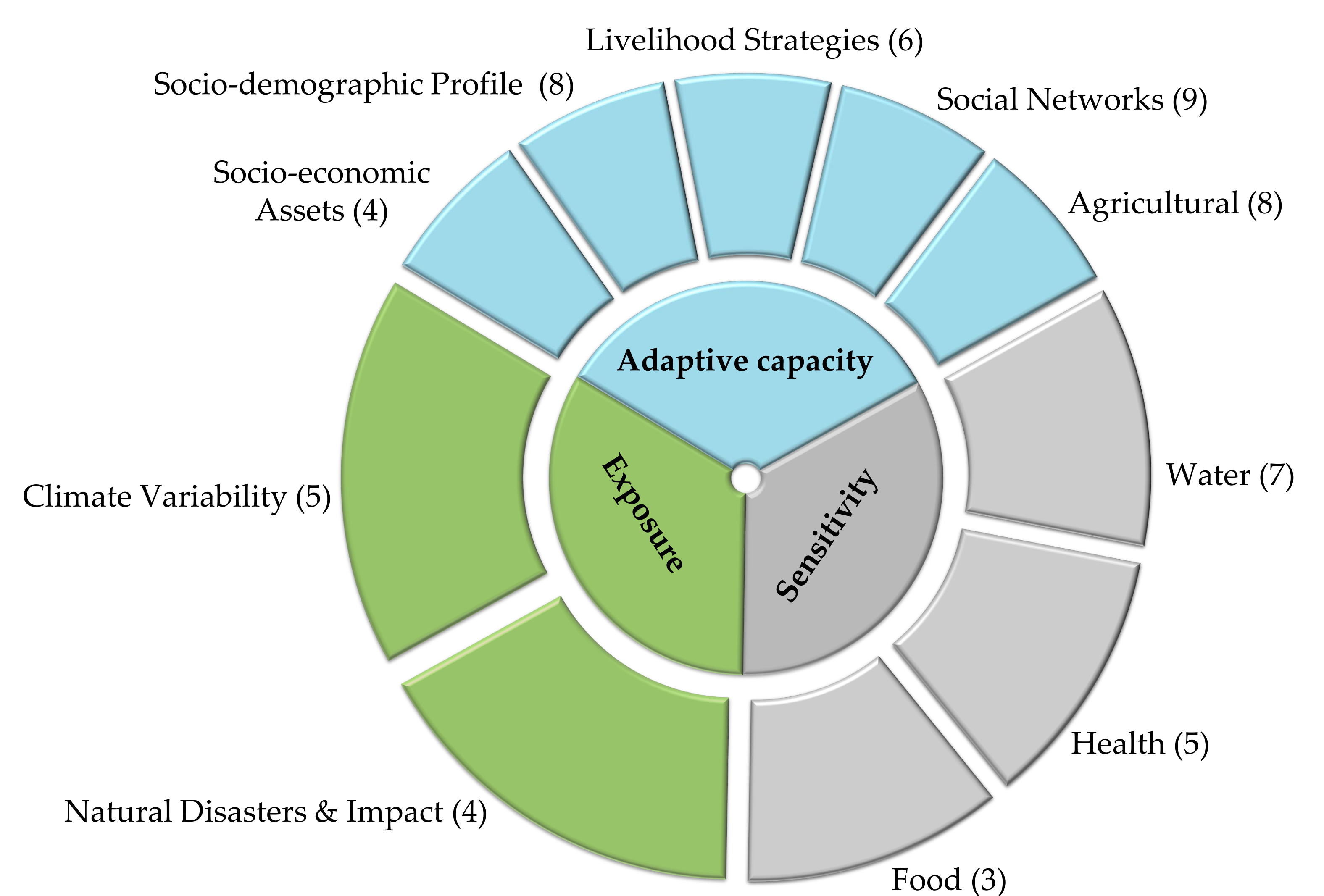


Fig 2. Dimensions and subcomponents of vulnerability

Outcome

1. Validation and documentation of adaptation strategies will be facilitated with the help of Farm Science Centres and line departments in the agro-ecological units.
2. The outcome of the study will help to identify the thrust areas for developing sustainable policies for micro and macro level planning for climate change adaptation and mitigation programs.
3. Furthermore, it leads to sensitization of farming communities in the agro-ecological units towards climate change and adaptation strategies.

Future directions

- Inclusion of climate resilient activities by using CRiSTAL (Community-based Risk Screening Tool –Adaptation and Livelihoods)
- Replicate the assessment to other agro-ecological zones of Kerala

References

Raghavan Sathyan. A., Funk, C., Aenis, T., Breuer, L. 2018. Climate Vulnerability in Rainfed Farming: Analysis from Indian Watersheds. *Sustainability*. 10(9):3357. <https://doi.org/10.3390/su10093357>.

Raghavan Sathyan, A., Funk, C., Aenis, T., Winker, P. and Breuer, L. 2018. Sensitivity analysis of a climate vulnerability index - a case study from Indian watershed development programs. *Climate Change Responses*. 5: 1. <https://doi.org/10.1186/s40665-018-0037-z>

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