

EXECUTIVE SUMMARY

Background

Climate-related hazards affect the poor and marginalized population directly through impacts on livelihoods, reductions in crop yields, or destruction of homes and indirectly through, for example, increased food prices and food insecurity. IPCC (2014) warns with ‘high confidence’ that “Climate-related hazards exacerbate other stressors, often with negative outcomes for livelihoods, especially for people living in poverty”. The population with minimum resources has the least capacity to adapt and therefore is the most vulnerable (IPCC 2001, IPCC 2014). IPCC (2014) also states with ‘very high confidence’ that “Impacts from recent climate-related extremes, such as heat waves, droughts, floods, cyclones, and wildfires, reveal significant vulnerability and exposure of some ecosystems and many human systems to current climate variability”.

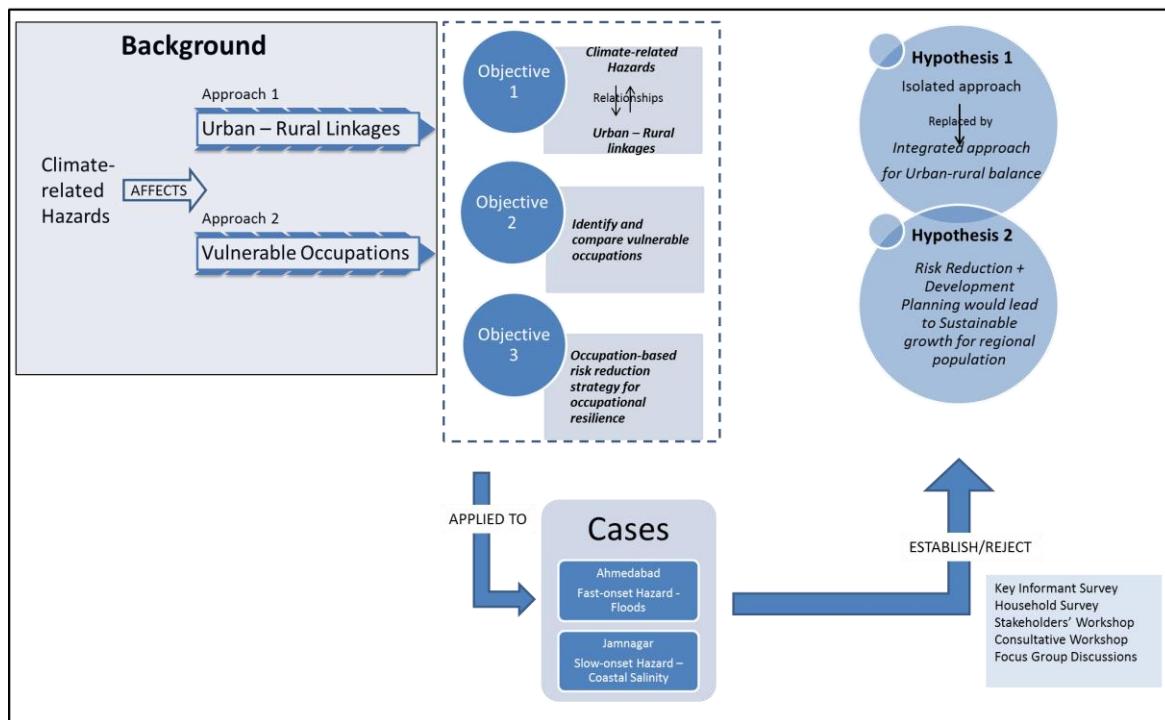


Figure 1 Conceptual Framework of the research

Research Objectives and Questions

Given the above mentioned issues and challenges, this research builds on the notion that occupation based approaches can reduce the risk due to climate-related hazards in Gujarat, India (see Figure 1).

The study has three main objectives:

1. Understand the regional transformative processes in Gujarat with reference to climate-related hazards and identify urban-rural flow elements impacted by such hazards.
2. Identify and compare vulnerable occupations in the cases of climate-related hazards
3. Prepare an occupation-based risk reduction strategy at the regional level by synthesizing urban-rural areas for the benefit of people engaged in vulnerable occupations

Research Questions

1. Do urban-rural linkages get affected by climate-related hazards?
2. How to make vulnerable occupations more resilient to the effects of climate-related hazards?

Research Locations

The study explores, compares and analyzes two climate-related hazards, namely: floods and coastal salinity in Greater Ahmedabad and Jamnagar respectively. Both the study sites are situated in Gujarat state of India (see Figure 2). These locations were selected as the two diverse cases of climate-related hazards, on the basis of Government of Gujarat's data of extent and scale of these hazards.

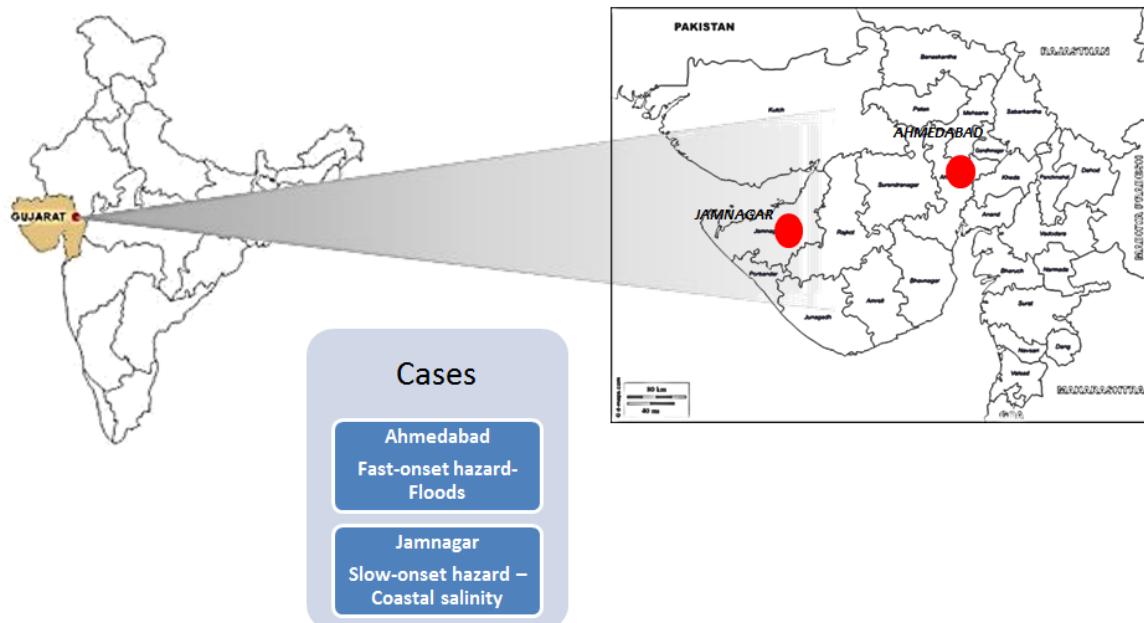


Figure 2 Research locations - Ahmedabad and Jamnagar, Gujarat, India

Structure of the Research

Table 1 gives the structure of the research with four major components: background, methodology, results and findings, and discussion and conclusion. The following paragraphs explain in brief the flow of the thesis report and the content of the following chapters:

Chapter 1 introduces to the research and its key points.

Chapter 2 interlinks the aspects of employment and hazard over the geographical domain. Occupations have many attributes which gets affected during a hazard and this chapter enumerates them into nine parameters of vulnerable occupations. It also primarily elaborates on the underlying characteristics of vulnerable occupations and introduces the new concept of occupational resilience. It highlights the current approaches which outlines the occupation-based risk reduction approach.

Chapter 3 deals with the urban-rural linkages that exist in India. It also identifies the elements within a framework; which flow from urban to rural area and vice versa, and how these elements get affected during the times of hazards and disasters. Additionally, this chapter explores the interrelationships between employment, poverty reduction and urban-rural flow elements.

Chapter 4 deals with the climate related hazards experienced by the state of Gujarat, India. It further elaborates on the hazard profile of Gujarat with special focus on floods and salinity issues in the state. The role of the stakeholders is also discussed to gauge their potential and scope in risk reduction.

Chapter 5 puts the parameters developed in the last two chapters to test through the first case of climate related hazard of urban floods in the region of Greater Ahmedabad. The survey had two major steps: key informant survey and the household survey. The results of the household survey are presented spatially and then discussed analytically to derive policy directions.

Chapter 6 presents the overview of the salinity problem in western India and the associated issues. It takes up the case study of Jamnagar district in the state of Gujarat in India, which has been plagued by coastal salinity problems for more than 50 years. Focusing on the urban-rural interrelationship, the chapter tries to identify the links between the slow-onset hazard and the components of local occupations. It also presents the findings of a household survey in the form of coping strategies adopted by both urban and rural communities and individuals.

Table 1 Structure of the Research

BACKGROUND	METHODOLOGY	RESULTS AND FINDINGS	DISCUSSION AND CONCLUSION
Cases : Climate-related Hazards	Preliminary Questionnaire based on literature	Identification of Vulnerable Occupations	Adaptation-led Strategy at the regional level by synthesizing urban-rural areas for the benefit of people engaged in vulnerable occupations.
1. <i>Ahmedabad</i> – Fast onset hazard (Urban Flooding)	Stakeholders' Opinion	Identification of Urban-Rural Flow Elements	Capacity building towards occupational resilience
2. <i>Jamnagar</i> – Slow onset hazard (Coastal salinity)	Household Survey at each study location	Occupational Coping Strategies	Determinant of Regional Growth - U-R Flow Elements
Urban-rural Flow	Focused Group Discussions		Policy Suggestions
Establishing Urban-Rural Flow Elements for the above mentioned cases	Qualitative Analysis		
Vulnerable Occupations	Quantitative Analysis		
Establishing parameters for Vulnerable occupations for climate related hazards			
Chapter 1 Introduction Chapter 2 Occupation-based Risk Reduction Chapter 3 Urban-Rural Linkages, Poverty Reduction and Climate-related Hazards Chapter 4 Climate related Hazards in Gujarat	Chapter 5 Vulnerable occupations in Urban Floods in Greater Ahmedabad Chapter 6 Vulnerable occupations in Coastal Salinity in Jamnagar		Chapter 7 Occupational resilience across Urban-rural domain for Risk Reduction Chapter 8 Conclusion

Chapter 7 explores the role occupation based risk reduction approaches can play in climate-related hazards in Gujarat, India. The chapter discusses the results from the previous chapters 5 and 6, and explores their implications in the risk reduction. It also highlights the importance of identifying impacts of the vulnerable occupations and devising an adaptation strategy based on the findings.

Chapter 8, the conclusion chapter, stresses on the key findings of the research study and draws key suggestions for future research on vulnerable occupations.

Research Process	1. Development and utilization of parameters for identifying vulnerable occupations
	2. Establishing flow elements for identifying Urban-Rural linkages
	3. Application of urban-rural flow elements to the two cases of Ahmedabad and Jamnagar
	4. Comparative evaluation of vulnerable occupations
	5. Identification of Issues and Challenges with Occupation-based Risk Reduction

Figure 3 Research Process for both the cases

Key Findings

The following key conclusions were derived from the research conducted in two diverse climate-related hazards of floods in Ahmedabad (fast-onset disaster) and coastal salinity in Jamnagar (slow-onset disaster) following the research process as shown in Figure 3.

1. The eight **urban-rural flow elements** have been identified and established for Ahmedabad and Jamnagar based on the literature survey and key informant survey, which are: people, natural resources, products, financial transactions, waste, information, social interactions and governance. The flow of ‘people’, ‘natural resources’, and ‘social interactions’ are most sensitive to both the cases of floods and salinity.
2. Nine **parameters of vulnerable occupations** in climate-related hazards have been established based on literature survey and key informant surveys in case study areas, which are: loss of productive assets, displacement and migration, loss of employment, decline in productivity, reduced income, workforce participation, change in occupation, effect on social structure, and recovery time.
3. In the case of floods in Ahmedabad (fast-onset disaster) in urban area, the ‘recovery time’ parameter is the most affected, while in rural areas the ‘decline in productivity’ shows the most significant results. Urban population’s dependency on rural population is higher than

rural population's dependency on urban areas. The government is the most trusted stakeholder and other non-traditional stakeholders exist in lesser number.

4. In the case of salinity in Jamnagar (slow-onset disaster) in urban areas the parameter affected the most is 'workforce participation' and in rural areas it is 'decline in productivity'. The rural population's dependency on urban areas is significantly higher than urban population's dependency on rural areas. Non-Governmental Organizations (NGOs) are the most trusted stakeholders followed by the government with the existence of a significant number of Self-help Groups (SHGs).
5. The study suggests that **the temporal aspect of disasters affect the vulnerability of occupations**. For rural areas 'decline in productivity' is the most significantly affected parameter for the case of both fast and slow-onset disasters. While fast-onset disaster shows higher dependency of urban population on rural areas, the slow-onset disaster shows higher dependency of rural population on urban areas.
6. The occupational resilience in these cases can be achieved through **policy revisions** (enriching existing employment schemes to take into account climate-related disasters), and **reassigning roles for non-traditional stakeholders** in Gujarat's context (such as Self-help Groups, Women Associations, Occupational associations, and slum associations) to include disaster preparedness and disaster recovery in their activities.