

Md. Nasif Ahsan^{*1,2} Kuniyoshi Takeuchi¹ Karina Vink¹

Background

- Historically Bangladesh is a cyclone-prone country due to its geographical location.
- About 10% of the world's cyclones originate in the Indian Ocean and the adjacent Bay of Bengal every year, which account for nearly 85% of the cyclone triggered damage worldwide.
- On average, at least 17 tropical cyclones form in the Bay of Bengal each year.

Disaster management trends in Bangladesh

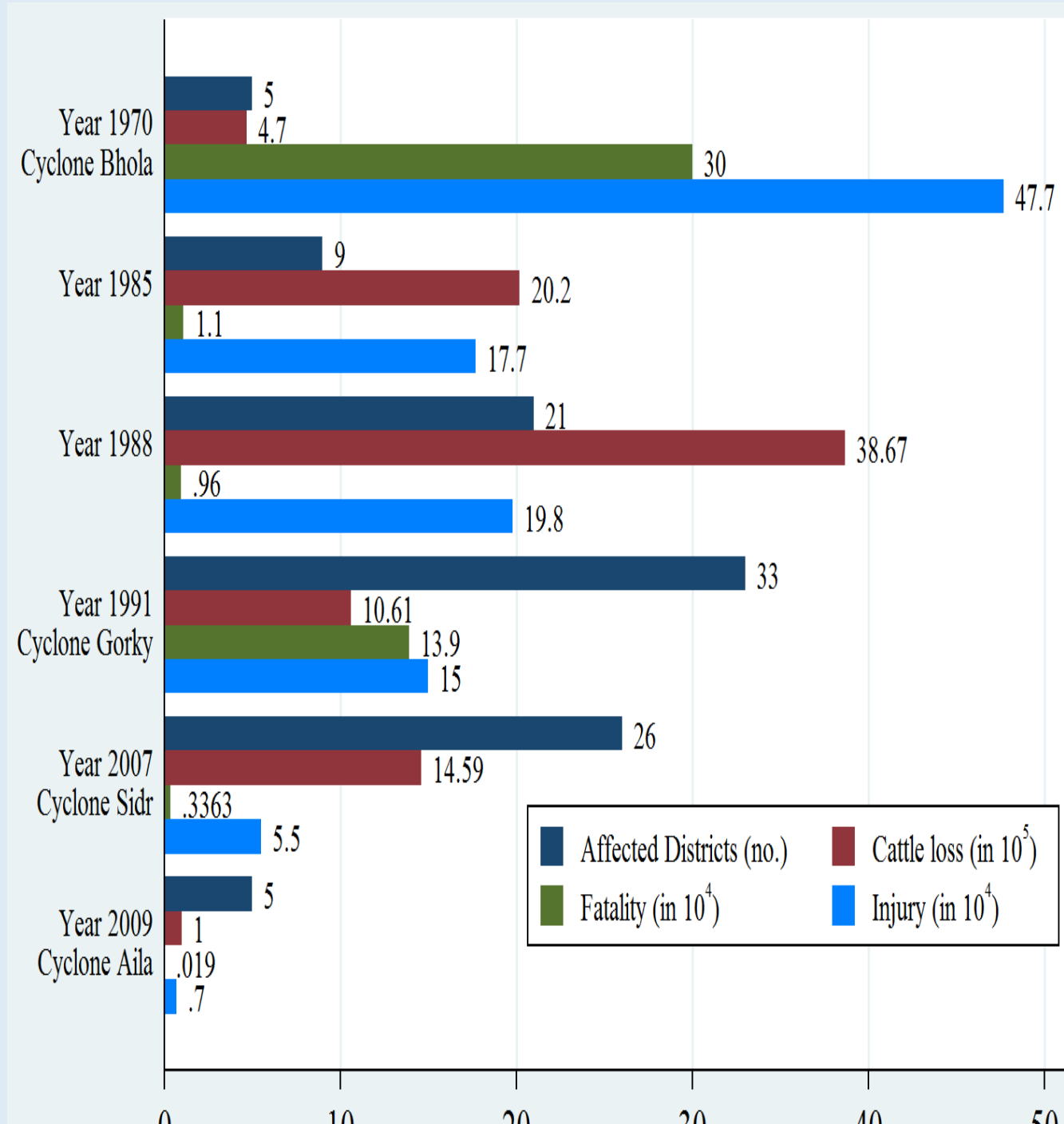


Fig. 1 Human and livestock loss due to cyclones
Source: Disaster Management Bureau of Bangladesh

1970-1990

- Coastal Preparedness Program (CPP)
- Flood Forecasting Warning Center
- Flood Action Plan
- Road transportation network
- Negotiation with Middle East countries for disaster relief

1991-2000

- Establishment of Disaster Management Bureau (DMB)
- Cyclone center construction
- Empowerment of disaster management committees to plan and coordinate risk reduction and emergency response

2001-Present

- Awareness raising
- Capacity building
- Collaborative partnership
- Mainstreaming disaster risk reduction strategies

- Previous studies suggested that, on average, at least 25% of the victims of Cyclones Gorky in 1991, Sidr in 2007, and Aila in 2009 were not interested in evacuation even after receiving warnings and evacuation advisories.
- Focusing on Cyclone Aila in 2009, this study explores the responses of people at risk in southwestern coastal Bangladesh to cyclone warnings and evacuation compliance.

Study location

Name: Koyra sub-district, Khulna
Area: 1800 sq. km.
Population: 194,000
Population density: 109/ sq. km
Male-female ratio: 0.96
Administrative units:
Union: 07
Village: 131
Main occupations: Fishing, cropping, forest resource collection, contract labour, and small business

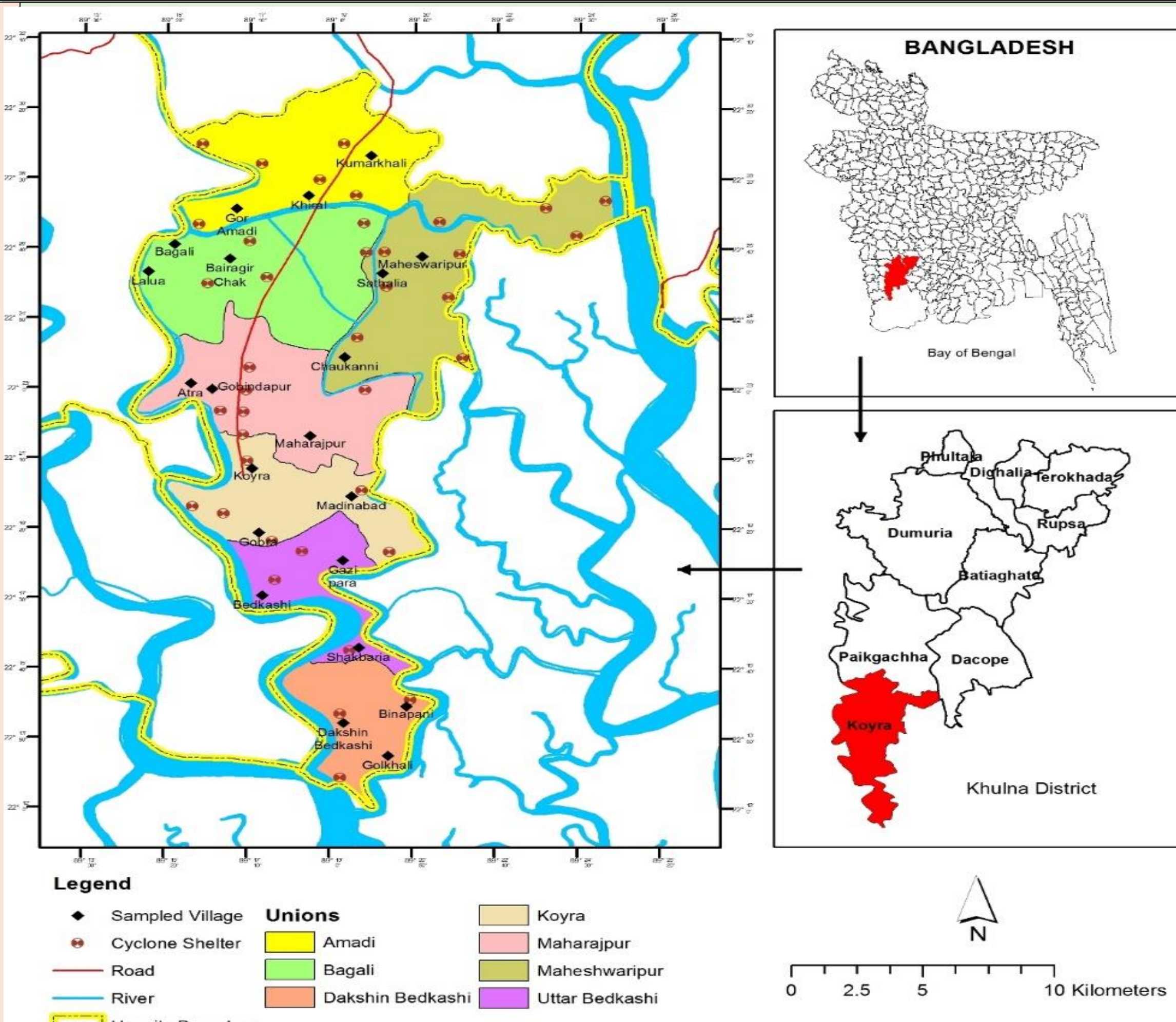


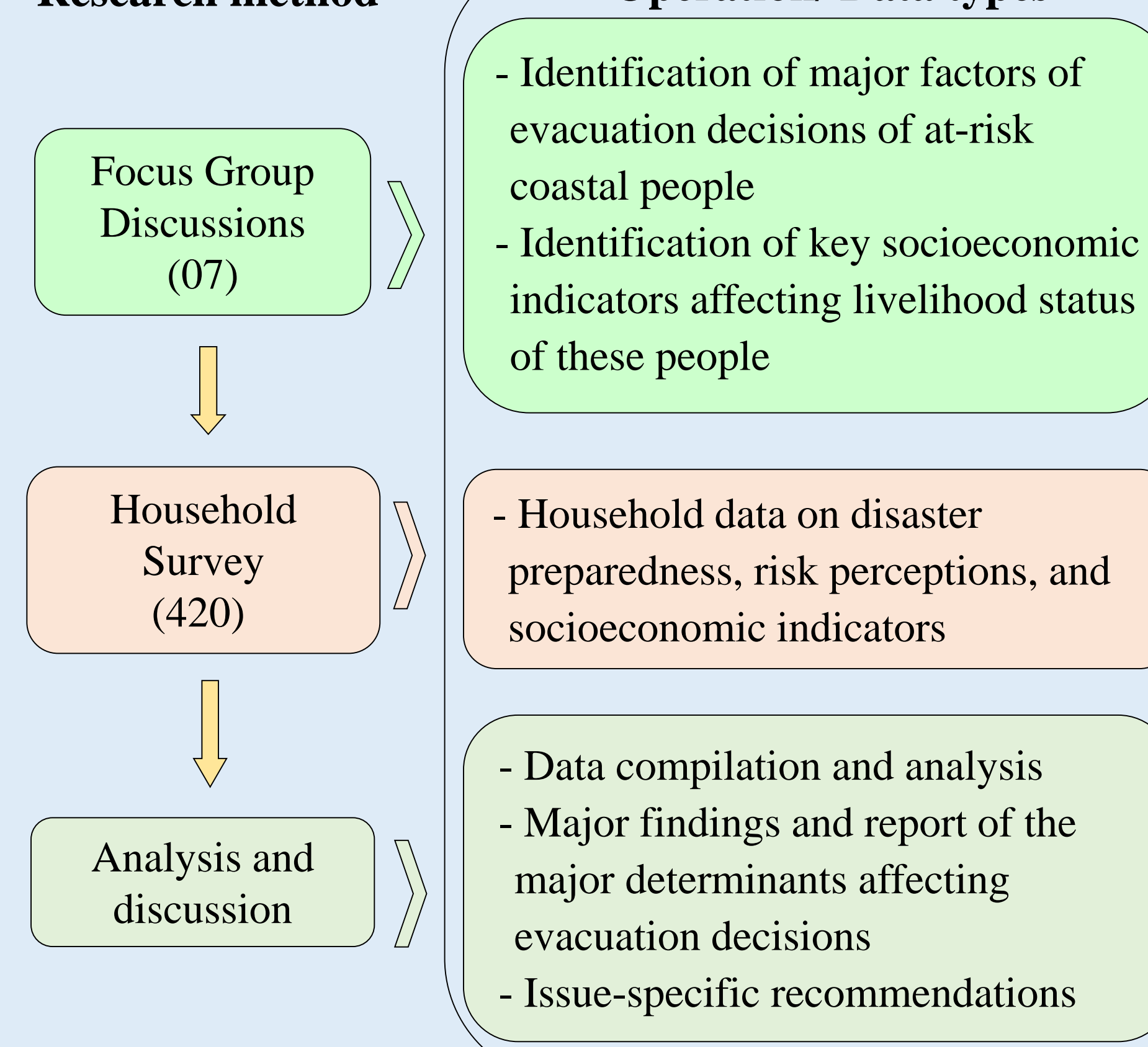
Fig 2. Geographical location of the study

Methodology

Data collection

- Primary data-based
- FGDs were conducted as per occupation basis.
- Structured questionnaire was applied for household survey.
- Systematic random sampling was applied to select the households for interview.
- Each interview took maximum 30 minutes to be completed.

Research method



Operation/ Data types

- Identification of major factors of evacuation decisions of at-risk coastal people
- Identification of key socioeconomic indicators affecting livelihood status of these people
- Household data on disaster preparedness, risk perceptions, and socioeconomic indicators
- Data compilation and analysis
- Major findings and report of the major determinants affecting evacuation decisions
- Issue-specific recommendations

Fig 3. Stages of data collection, data type, research methods, and operations

Analytical approach

- Principal Component Analysis (PCA) was applied to determine the major components along with concerned variables (i.e., factors) affecting evacuation compliance.
- A partial correlation was conducted among 46 variables to choose the variables for PCA. Next, 20 variables were selected with a correlation value of at least 0.60.

Conceptual approach

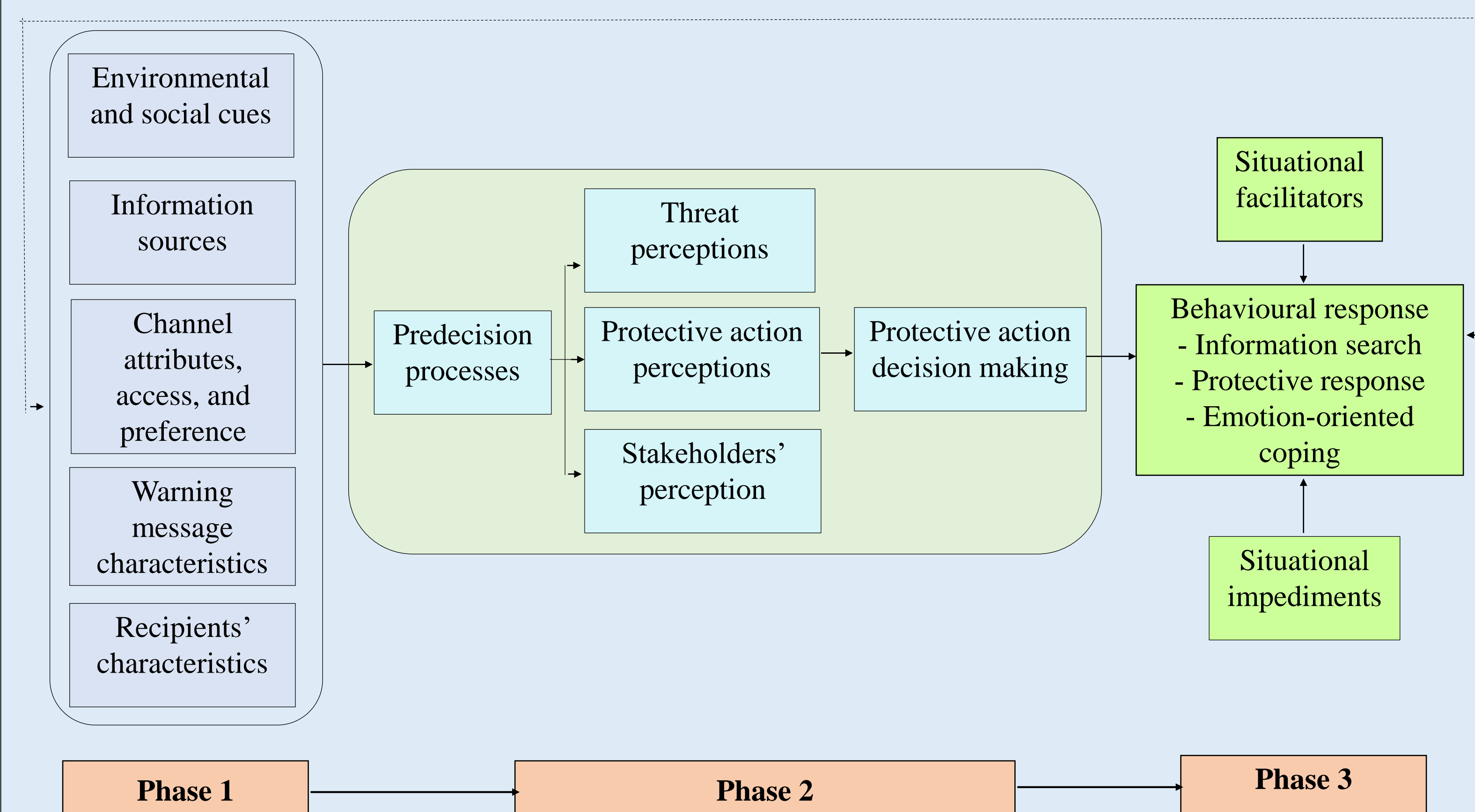
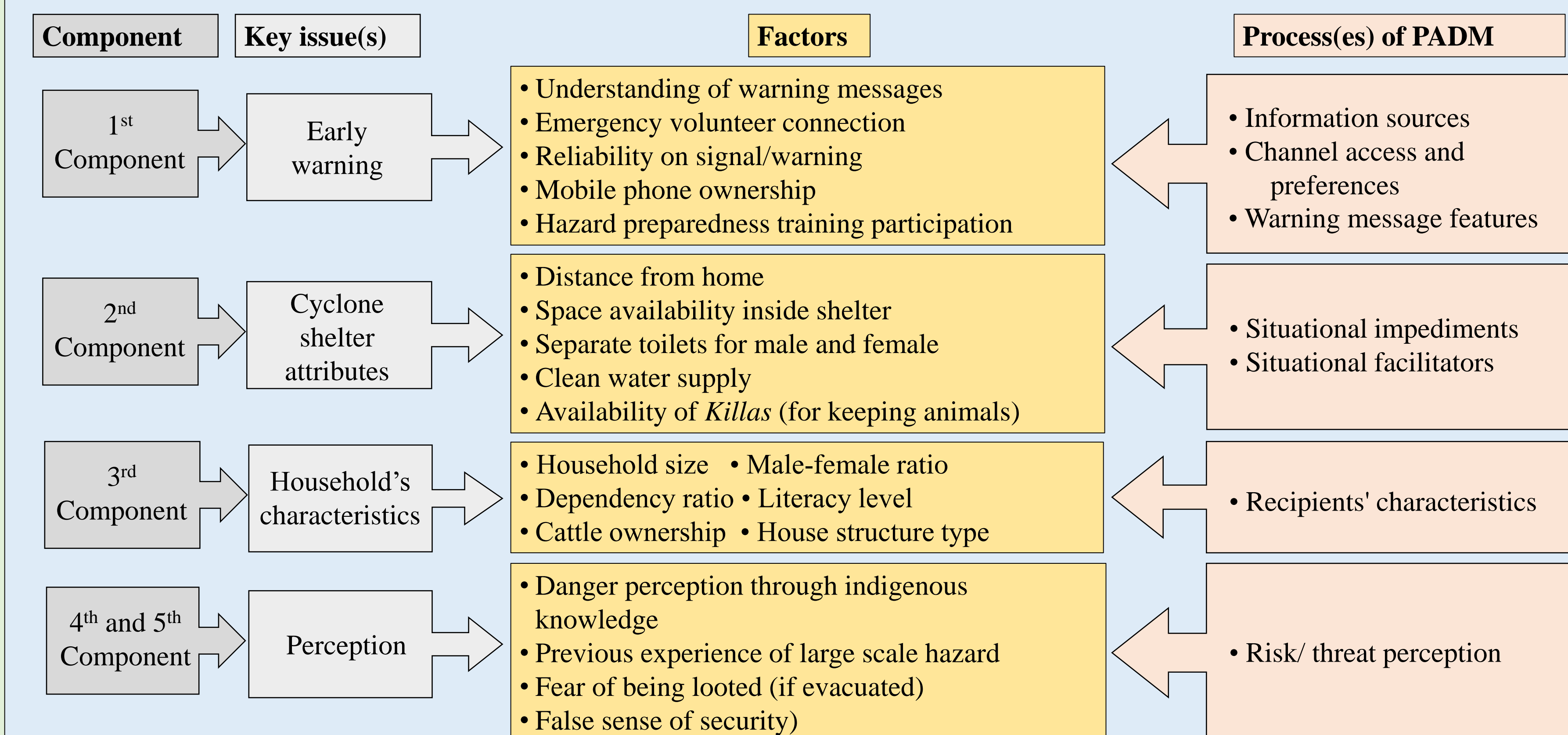


Fig 4. Process of information flow in the Protective Action Decision Model (PADM)

Source: Adapted and customised from Lindell & Perry (2012).

Results



- The empirical results indicate that the factors related directly and indirectly with early warning affect the degree of compliance with early warnings and advisories.
- The key **CHALLENGES** of early warning identified in this study are:

- Formal language and technical terms in warning messages are often difficult to understand
- The core message is often distorted in the process of dissemination from different sources
- Previous false alarms have led a lower degree of compliance with advisories

The OPPORTUNITIES for early warning and advisories compliance

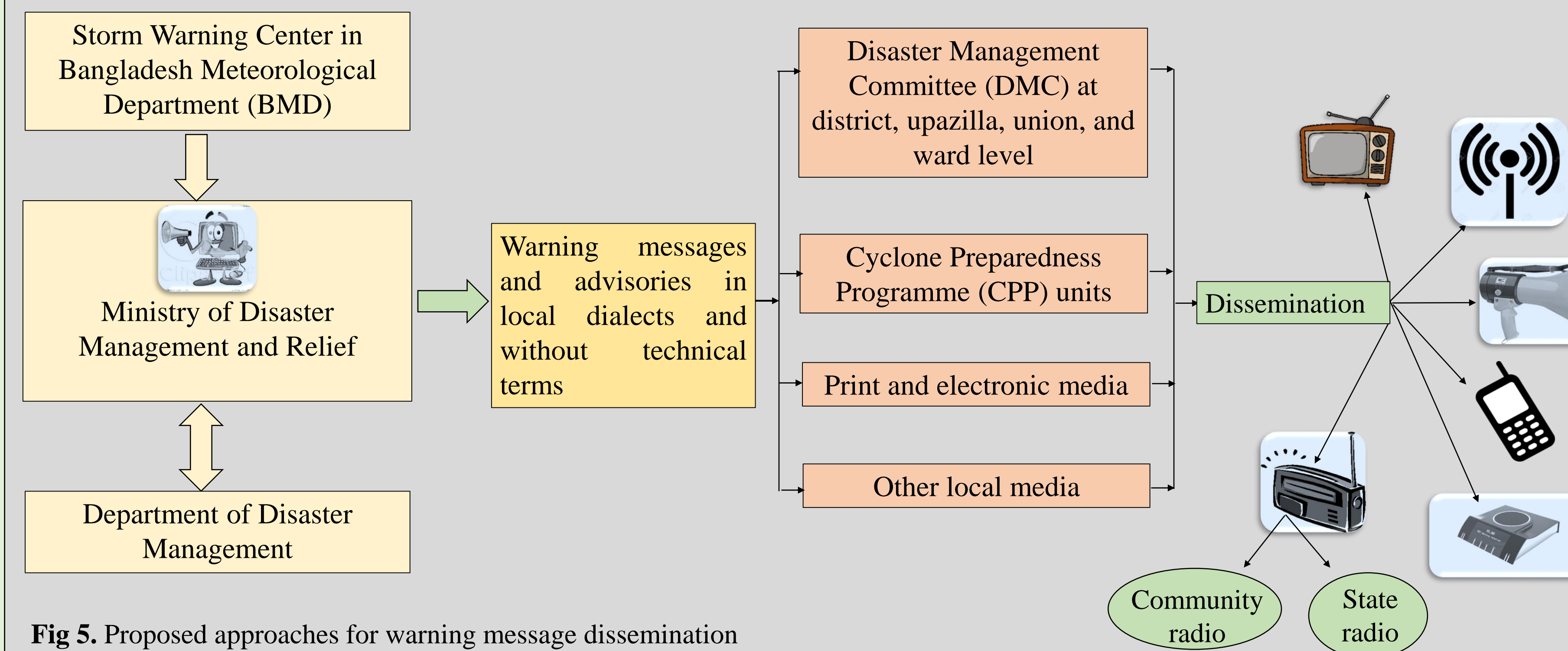


Fig 5. Proposed approaches for warning message dissemination

Conclusion

The findings from this case study demonstrated that in coastal Bangladesh the existing challenges for cyclone early warning mainly revolved around the channels of dissemination and the threat perception of people at risk. In this light, this study recommended the specific design of the warning message content (i.e., introducing local dialects) and utilizing the available and least costly channels for warning dissemination.

Acknowledgement: The financial support to attend this conference is provided by the Honjo International Scholarship Foundation (HISF), Tokyo, Japan.

References

- Ahsan, M. N., Takeuchi, K., Vink, K., & Warner, J. (2015). Factors affecting the evacuation decisions of coastal households during Cyclone Aila in Bangladesh. *Environmental Hazards*. doi:10.1080/17477891.2015.1114912
- Lindell, M. K., & Perry, R. W. (2012). The Protective Action Decision Model: Theoretical Modifications and Additional Evidence. *Risk Analysis*, 32(4), 616-632. doi: 10.1111/j.1539-6924.2011.01647.x

Authors

- * Corresponding author: Md. NASIF Ahsan; nasif@icharm.org
- ¹ International Centre for Water Hazard and Risk Management, Public Works Research Institute, Tsukuba, Japan
- ² National Graduate Institute for Policy Studies (GRIPS), Tokyo, Japan