Context-specific Operationalization of Community Resilience in Rural Areas

Pranjali Rai, Ph.D. Candidate, University of Washington | Himanshu Grover, Assistant Professor, University of Washington

OVERVIEW

Rural communities face a greater risk of being overwhelmed by natural disasters compared to urban areas due to their low risk management capacity. Building resilience in rural communities is often recommended to improve their ability to withstand such extreme events. However, it is crucial to understand **what resilience means and how it can be observed in a rural setting**. Given the diverse nature of rural areas, a context-specific approach is necessary to operationalize resilience. Furthermore, it is imperative to recognize the interdependence of resilience processes, illustrated by the significant role of household capacity in shaping the resilience of rural communities and vice-versa.

In this poster, we discuss our methodology for identifying and implementing relevant resilience indicators for communities in rural areas. We applied this methodology to study community resilience in Houghton and Baraga, two rural counties from the Western Upper Peninsula Region of Michigan. We conducted an online survey from February to May 2022, and received 125 complete responses from residents living in different cities, villages, and townships of these counties. In this survey, we asked for community members' opinion on the importance of different aspects associated with resilience indicators in terms of how much they can affect the ability of their household and community to withstand extreme events. Using this data, we determined relevance of both commonly prescribed and uniquely suited resilience indicators at both community and household levels for our study area.
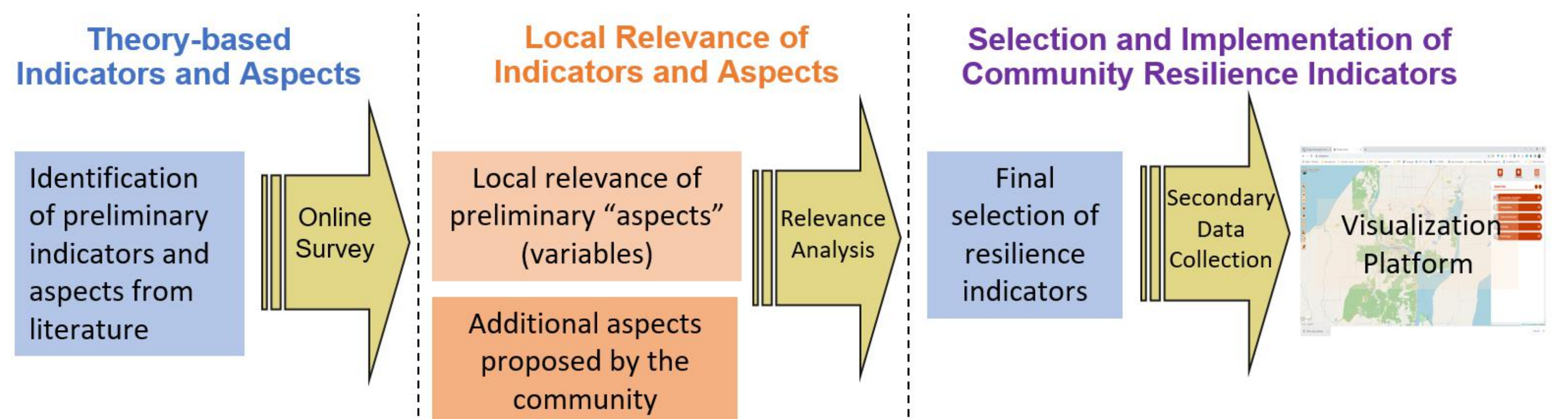

Figure 1: Proposed methodology for operationalizing resilience in communities from rural areas using a hybrid approach involving perspectives from existing literature and the community for selecting resilience indicators and associated aspects

Our methodology consists of three stages: 1) Identification of theory-based indicators and associated aspects (**preliminary aspects**) from literature that can affect resilience; 2) Data collection using an online survey to gather community members' perspective regarding importance of preliminary aspects and other potential aspects **(proposed by community members)** for local resilience; 3) identification of the most relevant indicators and their implementation in decision-making.
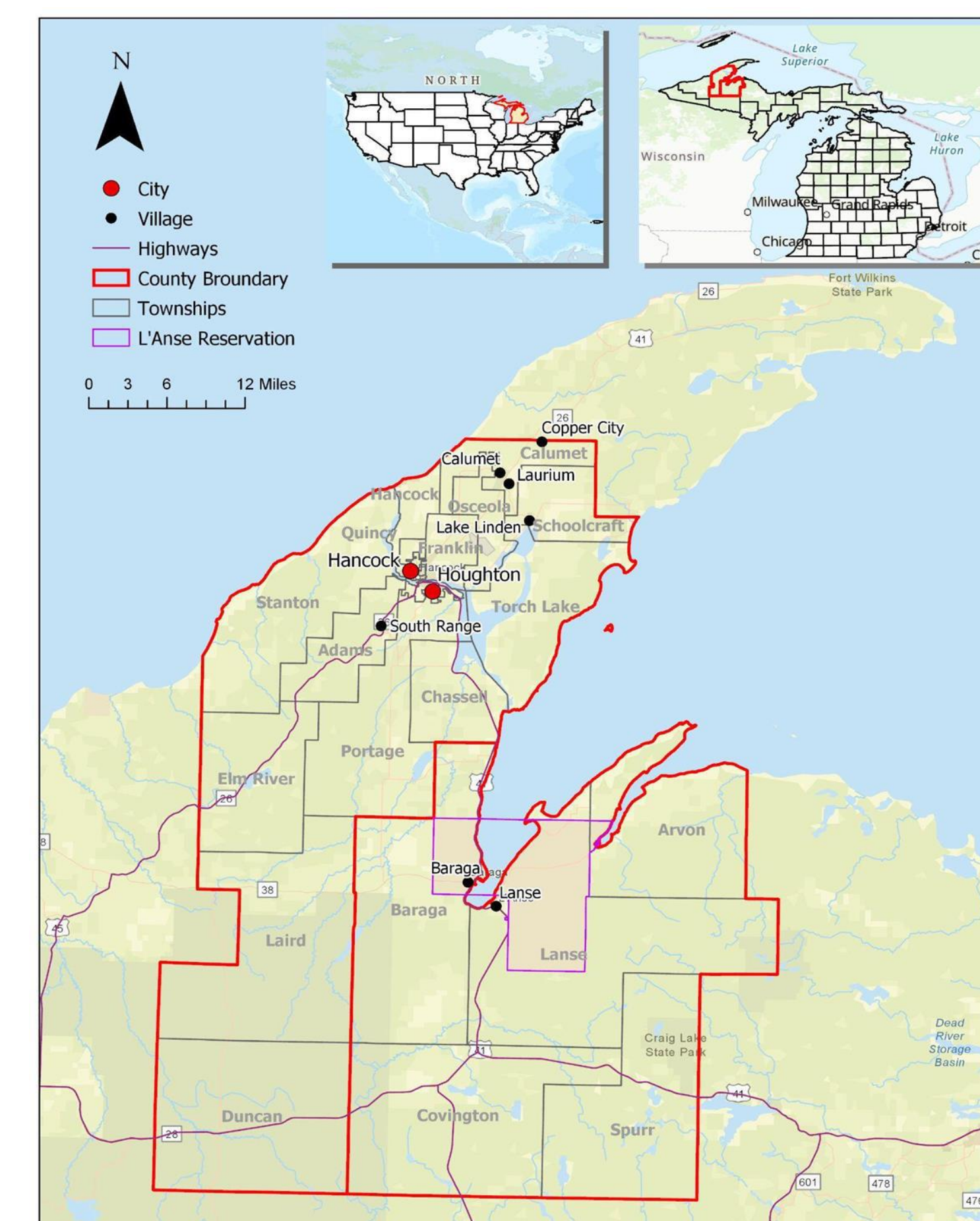

Figure 2: Study area map showing the location of Houghton and Baraga counties in the Upper Peninsula of Michigan and the location of cities, villages, and townships in the two counties

INDICATOR RELEVANCE

Relevance of preliminary aspects was assessed based on the % frequency of respondents who indicated that these aspects were important for their community and household resilience. One of the key findings of this study was the difference in relevance of certain preliminary aspects for community and household resilience. Difference in relevance of these aspects were also observed across demographic categories. These differences have policy implications, as they suggest potential resource mis-allocation due to direct translation of community resilience needs to all households. Also, relevance of aspects proposed by community members were synthesized in this study using thematic analysis of qualitative data from the survey.
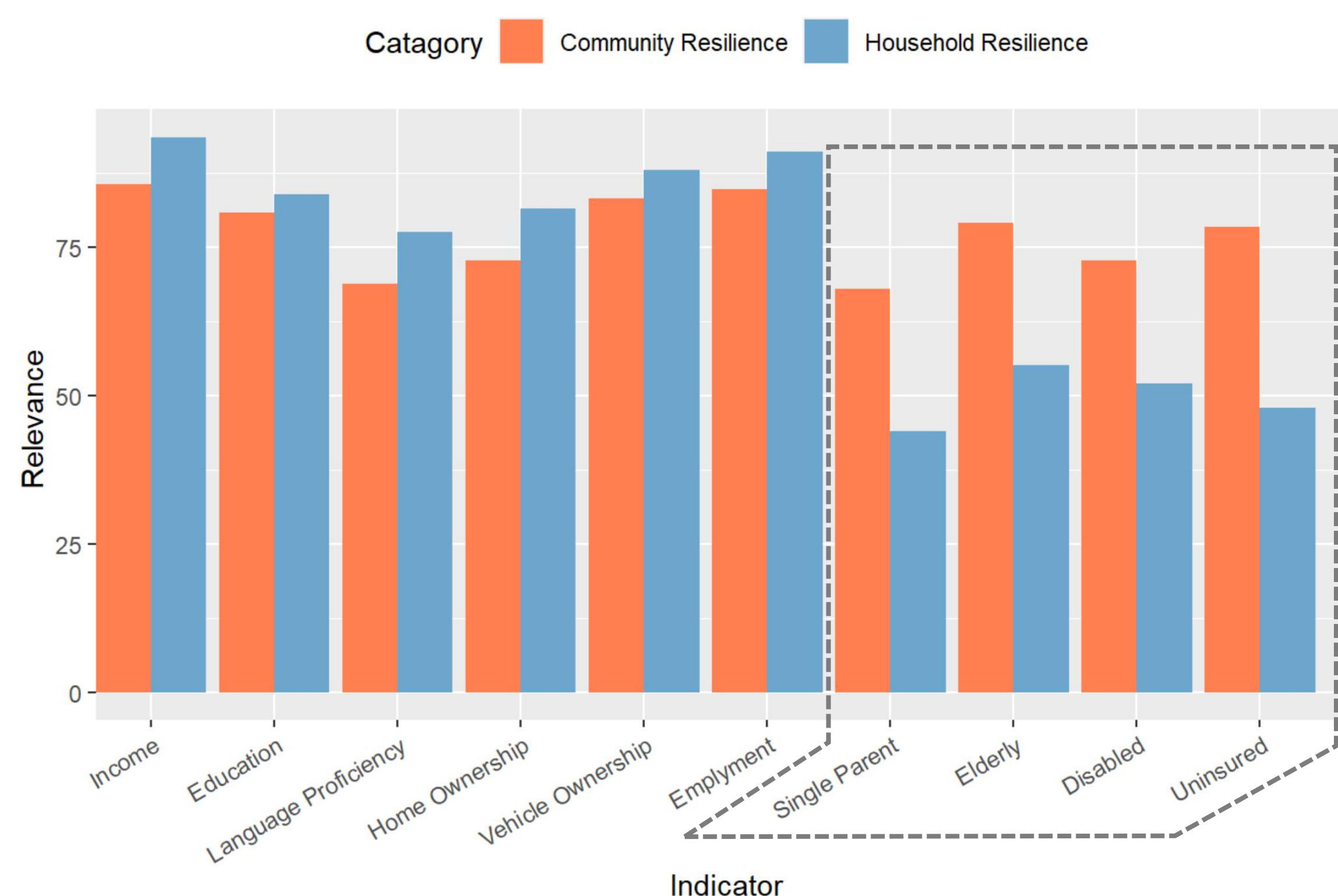
PRELIMINARY ASPECTS

Figure 3: Bar chart illustrating difference in relevance of aspects associated to preliminary indicators (x-axis) for community and household resilience.

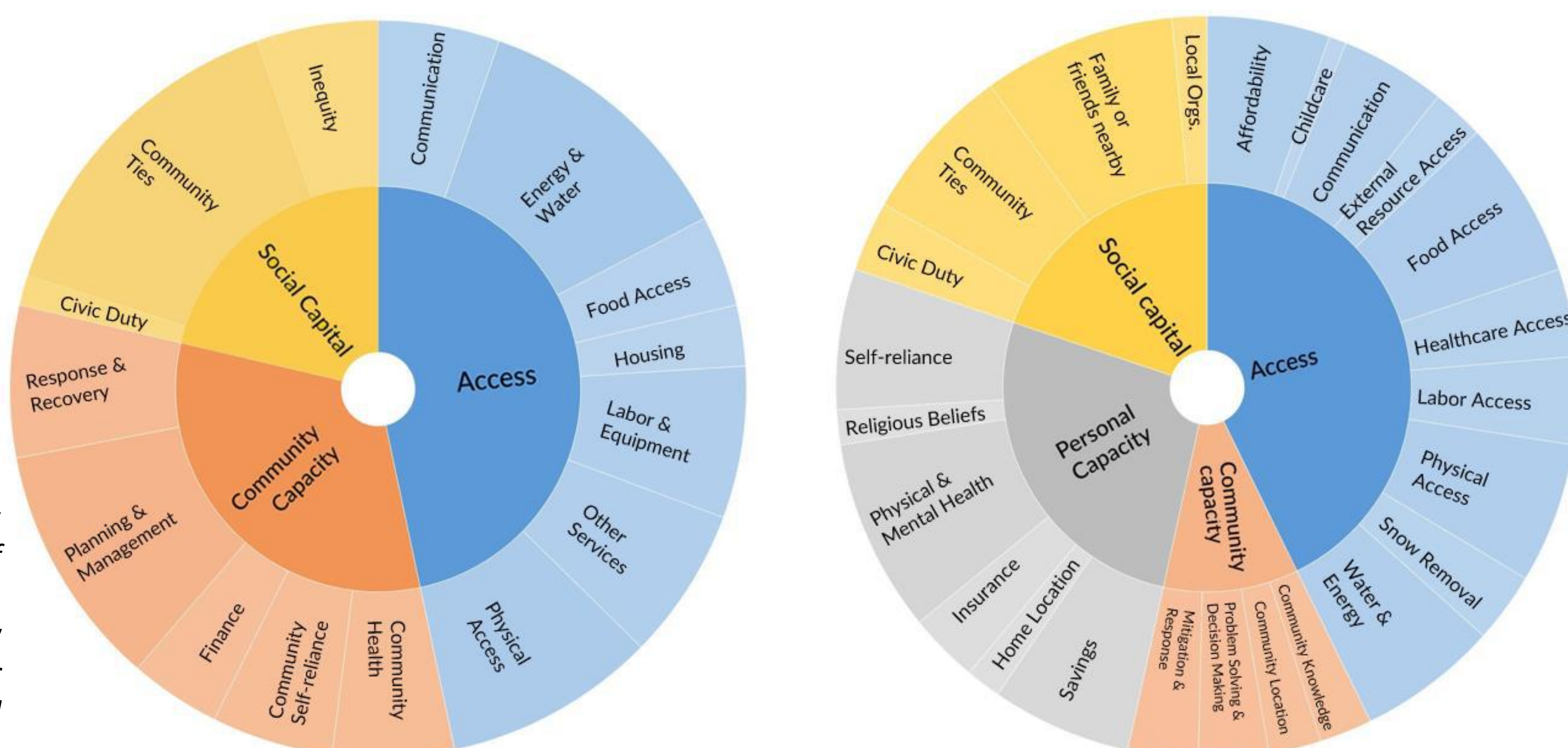**ASPECTS PROPOSED BY COMMUNITY MEMBERS**

Figure 4: Hierarchy diagrams based on the number of references for themes identified in aspects mentioned by survey participants that affect their resilience at community (a) and household (b) levels.
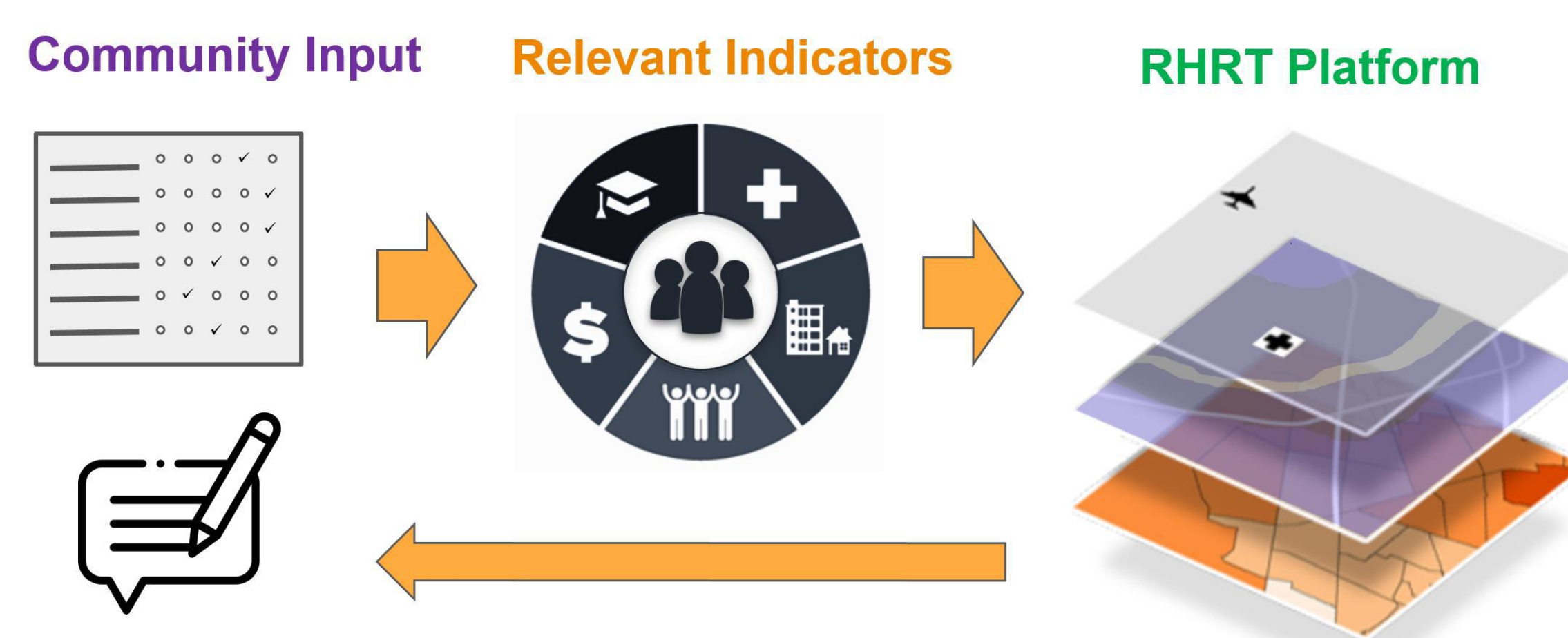
IMPLEMENTATION

Figure 5: Synthesis, implementation, and updating of relevant resilience indicators

Relevant indicators identified for our study area were made available to the local communities through the Rural Hazard Resilience Tools (RHRT) online data visualization platform. This platform includes spatial data for flooding, critical infrastructure, and administrative areas. A separate "Community Resilience Indicators" layer category was created on this platform to include available secondary data for the selected indicators. The interactive visualization using this platform can facilitate collective learning regarding the overall flood risk, which will in-turn inform platform users' perspective on the relevance of resilience indicators for their community. Hence, we recommend that the relevant resilience indicator list should be updated on a regular basis using feedback from the community regarding their continued applicability.
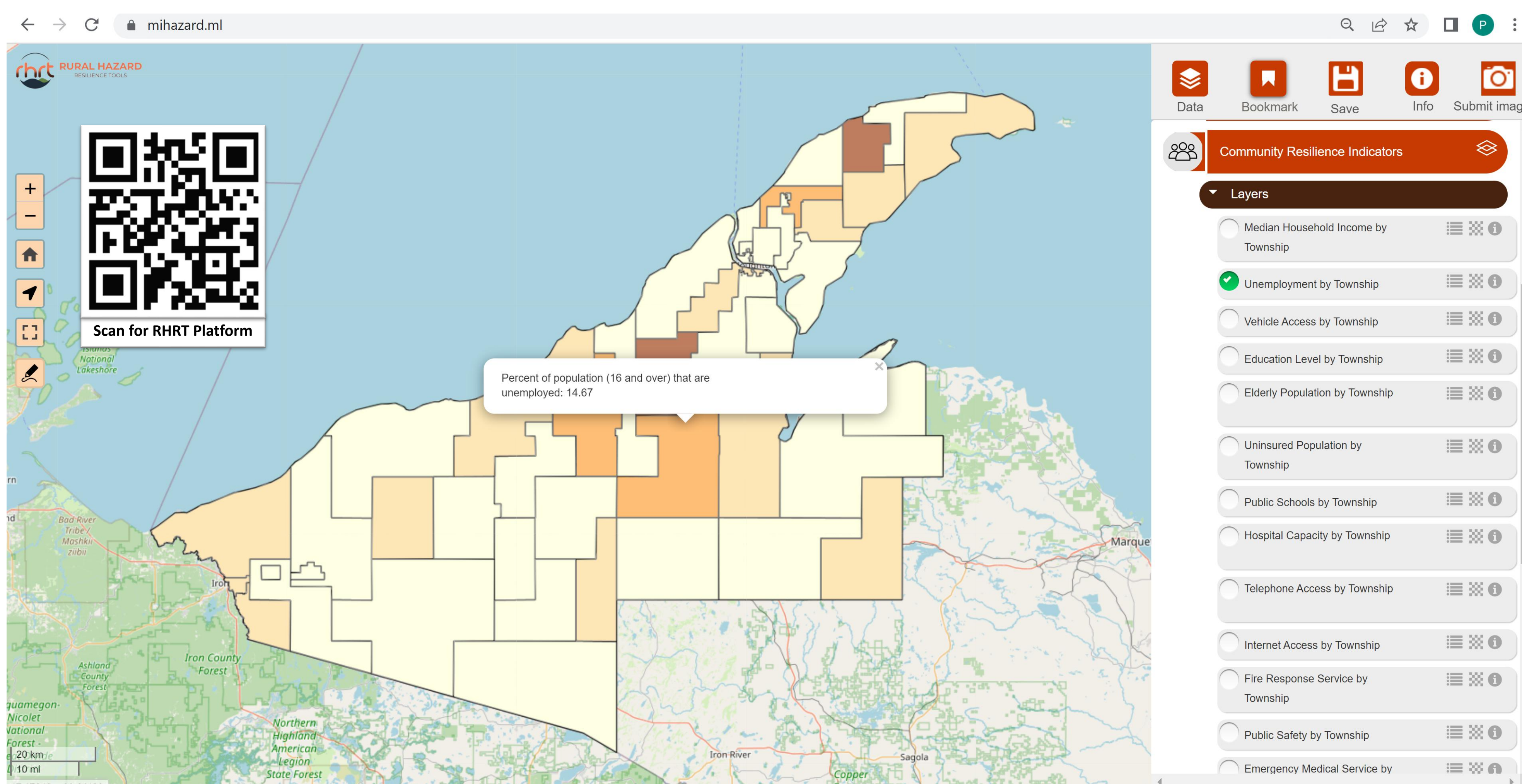

Figure 6: A separate "Community Resilience Indicators" layer category was created on the RHRT platform to host available secondary data for variables associated to the selected indicators for enabling interactive visualization of flood hazard, critical infrastructure, and community resilience data.

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