

Feasibility Study Final Report

| | |
|---|--|
| Title of Feasibility Study | (Japanese) |
| | (English) Enhancing disaster resilience of socio-ecological systems: Integrating multiscalar and geospatial environmental-hydrological-social data |
| FS Principal Investigator (Affiliation/Position/Name) | Hiroshima University/Associate Professor/ SIMANGAN Dahlia Collado |
| Affiliated program | Co-creation of the sustainable future based on the linkage of the earth-human system (Director: TANIGUCHI Makoto) |
| Period of the research | April 1, 2024 – March 31, 2025 |

This report will be posted on the RIHN website.

1 Overview of the research

Please summarize the FS research.

This FS project aimed at uncovering the factors that affect the resilience of communities exposed to social and ecological shocks, particularly natural disasters and violent conflicts. Understanding these factors would inform how research and policy can contribute to building more robust and effective approaches to stakeholder-informed disaster planning, response, and recovery. To do so, this research employs three integrated methodological phases. The first phase was the construction of a multi-dimensional well-being index using the Asia Barometer household survey data. This phase was initiated during the FS project. The second phase involves downscaling the geospatial and household data for candidate locations in Indonesia, Japan, and the Philippines through semi-structured interviews. The third phase is ground-truthing of the geospatial and household data through focus group discussions with affected communities and relevant stakeholders from government agencies and non-governmental organizations. The second and third phases will be continued beyond the FS project. This combination of quantitative and qualitative data analysis will enable us to evaluate the impact of disasters on well-being from national to local levels.

2 Results from the Incubation Study

Please describe the research results obtained during the FS period (including methods developed and organizations formed). Further, if there are concrete outputs, please list them. Describe whether you achieved the objectives originally envisioned and the reasons for this.

For the FS project, we were able to form a multidisciplinary team of researchers and students from Hiroshima University, Columbia University, and University of South Florida. The collaboration with students also equipped early-career researchers with methodological skills and introduced them to new professional networks useful for their career development. The project’s website can be found at www.asiapacificresilience.org. We will keep updating the website with activities and outputs from this FS project.

In the first phase of the project, we tested the viability of constructing a multidimensional well-being, which includes objective, subjective, comparative, equity/justice, and ecological types of well-being. After reviewing

Waves 4 and 5 of the Asia Barometer data, we were able to come up with a composite well-being index, which mostly includes economic indicators but is still informative of the objective, subjective, and comparative types of well-being. The next steps will include equity/justice and ecological indicators. Using Chronbach's Alpha and pairwise correlations with significance tests to validate the ability to create composite indices, a constrained set of parameters fits better in both Wave 4 & Wave 5. When adding in additional parameters of wellbeing, the reliability coefficient drops slightly, but the correlations remain fairly consistent. This is an indication that there is a positive and significant correlation between constrained and expanded well-being across the two waves. The planned modeling for FS study was not able to proceed beyond preliminary correlational and basic regression analysis due to institutional mismatch concerning fund transfer to the institutions of two team members. Despite this limitation, early statistical work shows interesting and statistically significant relationships among disaster exposure and well-being outcomes.

To complement the above, we added two Hiroshima University-based tasks during the FS project. The first is the review of available indices relevant to well-being, specifically the Human Development Index, the Happy Planet Index, the Global Peace Index, the Positive Peace Index, the Environmental Performance Index, and the Better Life Index. This review provided a social component to well-being, particularly in terms of how the presence or absence of peace influences well-being. The analysis for this task is at the final stages, and the draft paper is expected to be completed by July 2025 for submission to a reputable academic journal.

The second additional task is the creation of an environmental peacebuilding geoportal. This also adds a social component to resilience by examining how community-led resource management contributes not only to environmental resilience but also to social resilience through trust-building, social cohesion, and conflict prevention/resolution. The geoportal is still under development, but it now contains environmental peacebuilding projects drawn from a systematic review of literature. Currently, we are developing protocols for adding environmental peacebuilding projects and conducting a geospatial analysis of resources involved in the projects. In the future, we also plan to add a conflict/peace layer to the geoportal. The geoportal can be accessed at <https://arcg.is/iHn1D0>, and is scheduled for official launch in September 2025, accompanied by a journal article that introduces the geoportal.

3 List of achievements during the FS period

Please describe achievements such as “Books and Other publications”, “Papers”, “Misc.”, “Presentations”, “Works”, “Media Coverage” and “Awards” concretely the research results obtained during the FS period. Number them from the latest to the past, double underline the IS Principal Investigator and single underline the FS members, indicating whether items are peer-reviewed.

● **Books and Other Publications**

● **Papers**

● **Misc.**

● **Presentations**

Alfredo K, Atta N, Fisher, J, Garcia KS, Sharifi A, Simangan D. “Disaster Resilience in Island and Coastal Communities.” NERPS 2025 Conference: Achieving Peace and Sustainable Futures. Manila: 5-7 March 2025.

● **Works**

● **Media Coverage**

● **Awards**

Others: Describe here if there are major achievements other than the above.