

Exploring Gendered Knowledge
and Inclusiveness in
Community Resilience for
Flooding Disaster: Case Studies
in Can Tho City (Vietnam) and
Metro Cebu (Philippines)

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1. Summary

Climate change markedly elevates the dangers and damages linked to flooding, with forecasts suggesting more severe consequences in the future. Urban flooding presents a significant annual risk in cities like Can Tho (Vietnam) and Metro Cebu (Philippines), resulting in both physical destruction and human casualties, with women in these communities bearing a disproportionate weight. Despite their susceptibility, women are frequently marginalised in urban flooding governance and policy determinations intended to alleviate such hazards.

This research project, titled “Exploring Gendered Knowledge and Inclusiveness in Community Resilience for Flooding Disaster: Case Studies in Can Tho City (Vietnam) and Metro Cebu (Philippines),” funded by the Asia-Pacific Network on Global Change Research (APN), aims to investigate women's roles in adapting to urban flooding risks, evaluate the potential impacts of flooding, and enhance women's representation in urban flooding governance and resilience initiatives. A mixed-method approach was employed to achieve these aims, using stakeholder consultation workshops and many in-country workshops and meetings in both cities to enhance engagement. The study employed both quantitative and qualitative methodologies, utilising semi-structured interviews, household surveys, and focus group discussions to collect insights from provincial, district, and commune tiers. Participatory Rural Appraisal (PRA) methodologies were utilised to assess the effects of urban flooding on women in the chosen research locations.

Several workshops and meetings were conducted within the project framework, involving both Vietnam and the Philippines, as well as domestic meetings in each country. The project was launched at the Science and Technology Association (STA) in Can Tho City, Vietnam, at the 1st Stakeholders’ Workshop on Developing Research Framework and Action Plan (November 29–30, 2019). Experts from governmental bodies, non-governmental organisations, and academic institutions were present. The workshop concentrated on formulating a research framework and action plan to enhance urban flooding resistance. Initially, all representatives engaged in a debate regarding the key issues that have occurred in Can Tho City, both historically and presently. Subsequently, we delineated the four work packages (WPs): socio-hydrological systems, historical-social-economic-political aspects of floods, participatory community groups, and community resilience. Discussions focused on integrating gender-centred perspectives and using collaborative approaches to flood risk analysis. Stakeholders provided thoughts regarding the flooding issues in Can Tho City and Metro Cebu. This event established the groundwork for executing the project's operations and involving essential stakeholders. Furthermore, we conducted fieldwork on the second day to engage with and confer with local governments at the designated research sites. This assists us in formulating future strategies for data collection.

During the COVID-19 pandemic, research teams in the Philippines and Vietnam coordinated project operations through virtual meetings held via Zoom. These sessions made sure that schedules were in line, modified data collection procedures, and kept the project moving

forward in spite of logistical difficulties. Discussions encompassed research advancements, stakeholder involvement approaches, and modifications to the limitations imposed by the epidemic.

Additionally, the project activities are carried out through in-country meetings and conferences. Examples of activities in the Philippines comprise the Courtesy Calls and Meetings with Village Leaders (Metro Cebu, Philippines), the 2nd Quarter BRWWQMA Governing Board Meeting (June 30, 2022, Metro Cebu, Philippines), and the 11th Local River Summit (October 1, 2022, Metro Cebu, Philippines). In Vietnam, various fieldwork activities are conducted, including expert meetings in Can Tho City, local stakeholder meetings in Phu Hoa and Ke Sach Wards, and 150 household surveys across the two designated wards in Can Tho City.

In summary, this study project emphasises the essential requirement for gender inclusivity in urban flooding resilience and governance, concentrating on Can Tho City, Vietnam, and Metro Cebu, Philippines. Through virtual coordination during the COVID-19 pandemic, stakeholder workshops, and extensive in-country operations like fieldwork, meetings, and household surveys, the project was able to successfully incorporate gendered perspectives into community resilience strategies and flood risk analysis. The project established a framework for tackling urban flooding concerns by prioritising participatory approaches and encouraging collaboration among stakeholders, while also advancing gender equality and empowering marginalised populations.

2. Objectives

The overarching aim of this study is to take on the exciting and timely opportunity from recent scientific and technological advances and develop an innovative and effective community-based flood risk management strategy to build community resilience to urban flooding from socialist and naturalist perspectives. Specifically, the following objectives are identified:

- Assemble a cohesive inter-disciplinary research team and establish strong researcher stakeholder partnerships to develop effective approaches to co-produce and share knowledge, communicate and manage risk, and enhance community resilience to urban flooding;
- Understand the key drivers of flood hazards, especially the vulnerable social – ecological systems and apply a hazard risk analysis framework to quantify flood risk in the case study;
- Investigate and understand the historical and cultural implications for gender vulnerability, contemporary resilience building, and impacts on socio-economic development;
- Adopt a participatory approach to scope a pilot community-based urban flooding management based on qualitative/quantitative data and remote-sensing data streams considered as adaptive measures and pathways for enhancing gender inclusiveness and resilience of flood-prone areas, particularly in Can Tho City and Metro Cebu.

- Identify the major challenges in developing community resilience and develop a preliminary approach to measuring community flood resilience.

3. Outputs, Outcomes and Impacts

Outputs	Outcomes	Impacts
Vietnam		
Completed 1st Stakeholders' Workshop on Developing Research Framework and Action Plan	Developed a research framework and action plan for the entire project.	Enhanced stakeholder engagement and collaboration by integrating diverse perspectives into the research framework and action plan, ensuring inclusivity and shared ownership of the project.
Completed expert meetings in Can Tho City	Designed questionnaires and research instruments for household surveys and group discussions.	Improved the development of tailored research tools and questionnaires, ensuring data collection methods are precise, contextually appropriate, and aligned with the project's objectives.
Completed KIP interviews in Can Tho City	Conducted Key Informant (KIP) interviews in Can Tho City, providing qualitative data on urban flood disasters, gendered vulnerability, and resilience.	Incorporated expert perspectives via KIP interviews, enhancing comprehension of urban flood disaster dynamics and guiding context-specific, evidence-based policy recommendations.
Completed local stakeholder meetings in Phu Hoa and Ke Sach Wards	Obtained local assistance for fieldwork activities, including household surveys and group discussions	Strengthened engagement among local stakeholders and improved logistical assistance, allowing for the effective execution of fieldwork operations and the collection of accurate, contextually appropriate data.
Completed focus group discussions towards residents in Phu Hoa and Ke Sach Wards	Collected qualitative data regarding the adaptive strategies, experiences, and perceptions of residents in	Obtained valuable insights into community-level dynamics and localised knowledge regarding urban flood disasters, thereby increasing the relevance and

	response to urban floods and socio-economic challenges.	applicability of research findings to inform targeted interventions and policy recommendations.
Completed household surveys across the two research locations	Collected comprehensive quantitative data on urban flood disasters, gendered vulnerability, and resilience, providing a foundation for analysing patterns and trends across the two research locations.	Obtained crucial empirical knowledge on urban flood disasters, gendered vulnerability, and resilience to inform equitable and effective strategies for adaptation and policy frameworks.
Engaged university students in the project's fieldwork activities	Facilitated the development of 15 university students' practical research skills, including community engagement, data collection, and applied research methodologies, through field experience and research training.	Improved the capacity of the next generation of researchers by engaging university students in fieldwork activities
Established and disseminated project activities through the Mekong WASH and Agro-Ecology Resilience (Mekong-WASHER Hub)	Facilitated knowledge sharing and collaboration by integrating project activities into the Mekong-WASHER Hub, increasing visibility and stakeholder engagement.	Improved regional knowledge exchange and advocacy by disseminating project activities through the Mekong-WASHER Hub
The Philippines		
Produced nine research articles	Promoted the adoption of Barangay Paknaan in Mandaue City as a partner community of UCLM.	Provided assistance to community members in keeping their separate regions cleaned and tidy.
Established Project Dolphin Flood Hub	Adopted Stations 1 and Station 2 of the Butuanon River Watershed Water Quality Management Area (BRWWQMA). These stations are the collection areas for water quality testing and identified areas for flood control.	Monitored drainage systems monthly to check for solid wastes affecting water flow.

Presented nine research studies during the Butuanon River Watershed Water Quality Management Area (BRWWQMA) Quarterly Meeting.	Provided assistance and pre-positioned goods for communities needing help during flooding situations.	Joined clean-up programs of the university by faculty, non-teaching staff, students, and alumni, with an increase in participants.
<p>Provided copies of the nine research articles to 6 local government units:</p> <ul style="list-style-type: none"> * Village Tinago, Cebu City * Village Kalubihan, Cebu City * Village Paknaan, Mandaue City * Village Looc, Mandaue City * Village Basak, Lapu-Lapu City * Village Looc, Lapu-Lapu City 	Created a Disaster Risk Reduction and Management Team in the university composed of medical doctors, nurses, safety officers, and individuals trained in DRRM.	Led to the planning of the Butuanon River Watershed Water Quality Management Area (BRWWQMA) Research Conference, slated for June 2025.
<p>Provided copies of the nine research articles to 3 cities:</p> <ul style="list-style-type: none"> * Cebu City * Mandaue City * Lapu-Lapu City 	Created the University's Materials Recovery Facility for solid waste management, contributing to cleanliness and orderliness in the area.	Graduated two Eco Scholars with degrees in Maritime Education.
Facilitated the Eco Scholarship in UCLM	Created the Eco Scholarship, supporting tuition and miscellaneous fees for students working in the Materials Recovery Facility at UCLM.	Appreciated by community residents, the importance of solid waste management, DRRM, and community participation in various extension programs.

4. Key facts/figures

The research initiatives in the Philippines and Vietnam have resulted in substantial achievements, as evidenced by the main figures that emphasise the projects' scope and impact. In Vietnam, collaborative endeavours were dedicated to stakeholder engagement, community involvement, and fieldwork activities, while in the Philippines, the emphasis was on research dissemination and educational support. Listed below are the significant important figures and accomplishments that underscore the progress made in both countries.

Vietnam Team

- One Stakeholders' Workshop: Completed the first workshop on Developing Research Framework and Action Plan.
- Three Focus Group Discussions: Held in Phu Hoa and Ke Sach Wards.
- 150 Household Surveys: Conducted across two research locations.
- 15 University Students: Engaged in the project's fieldwork activities.
- One Mekong WASH and Agro-Ecology Resilience (Mekong-WASHER Hub) established.

The Philippines Team

- Nine qualitative research articles are produced.
- Nine papers presented in local and national research conferences.
- Two Eco Scholars have graduated from the proceeds of the Materials Recovery Facility.
- One international research conference was conducted.
- One Flood Hub was established.
- One Materials Recovery Facility was created.

5. Publications

Nguyen, T. V., Amparado, M. A. P., Pham, P. T. L., Ky, Q. V., Phan, N, Q. T., Diep, N. T. H., Phan, V. D., Nguyen, V. K., (2024). Gendered Perception, Vulnerability and Adaptation to Floods in Urban Communities in Can Tho City, Vietnam. Japan: Asia-Pacific Network for Global Change Research. APN Science Bulletin (*ongoing publication*).

Socio-Economic, Political and Historical Dimensions of Urban Flooding and the COVID-19 Pandemic in Cebu City, Cebu, Philippines

Authors: Micabalo, K. G., Atillo, L. A., Amparado, M. A. P., Son, A. L. B.

Participatory Groups, Flooding and COVID-19 Pandemic in Cebu City, Cebu, Philippines

Authors: Amparado, M. A. P., Son, A. L. B.

Flooding, COVID-19 Pandemic and Resilience of Vendor-Residents: Cebu City, Cebu, Philippines

Authors: Amparado, M. A. P., Son, A. L. B.

Socio-Economic Implications of Urban Flooding Vis-à-vis Gender Equality: The Case of Mandaue City, Cebu, Philippines

Authors: Poliquit, W. M. T., Navarro, J. A. P., Bachanicha, R. M., Amparado, M. A. P., Son, A. L. B.

Participatory Groups, Urban Flooding and the COVID-19 Pandemic: The Case of Mandaue City, Cebu, Philippines

Authors: Montebon, R. L., Amparado, M. A. P., Son, A. L. B.

Urban Settlers' Resilience to Flooding Disasters and the COVID-19 Pandemic: The Case of the Highly Urbanized City of Mandaue, Cebu, Philippines

Authors: Amparado, M. A. P., Montebon, R. L., Son, A. L. B.

Socio-demographic and Political Perspectives on Urban Flooding Risk Reduction and Management of the Residents of Lapu-Lapu City, Cebu, Philippines

Authors: Bachanicha, R. M., Samar, D. A., Amparado, M. A. P., Son, A. L. B.

Integrated Community Participation and Multi-Gendered Perceptions on Urban Flooding and the COVID-19 Pandemic in Lapu-Lapu City, Cebu, Philippines

Authors: Cag-ong, A. B., Sabornido, E. B., Amparado, M. A. P., Son, A. L. B.

Community Resilience to Flooding and the COVID-19 Pandemic: Case of Lapu-Lapu City, Cebu, Philippines

Authors: Montebon, R. L., Patindol, D. B., Amparado, M. A. P., Son, A. L. B.

6. Media reports, videos and other digital content

- Dissemination of APN project activities via Mekong WASHER Hub: <https://mekongwash-er.com/en/projects>



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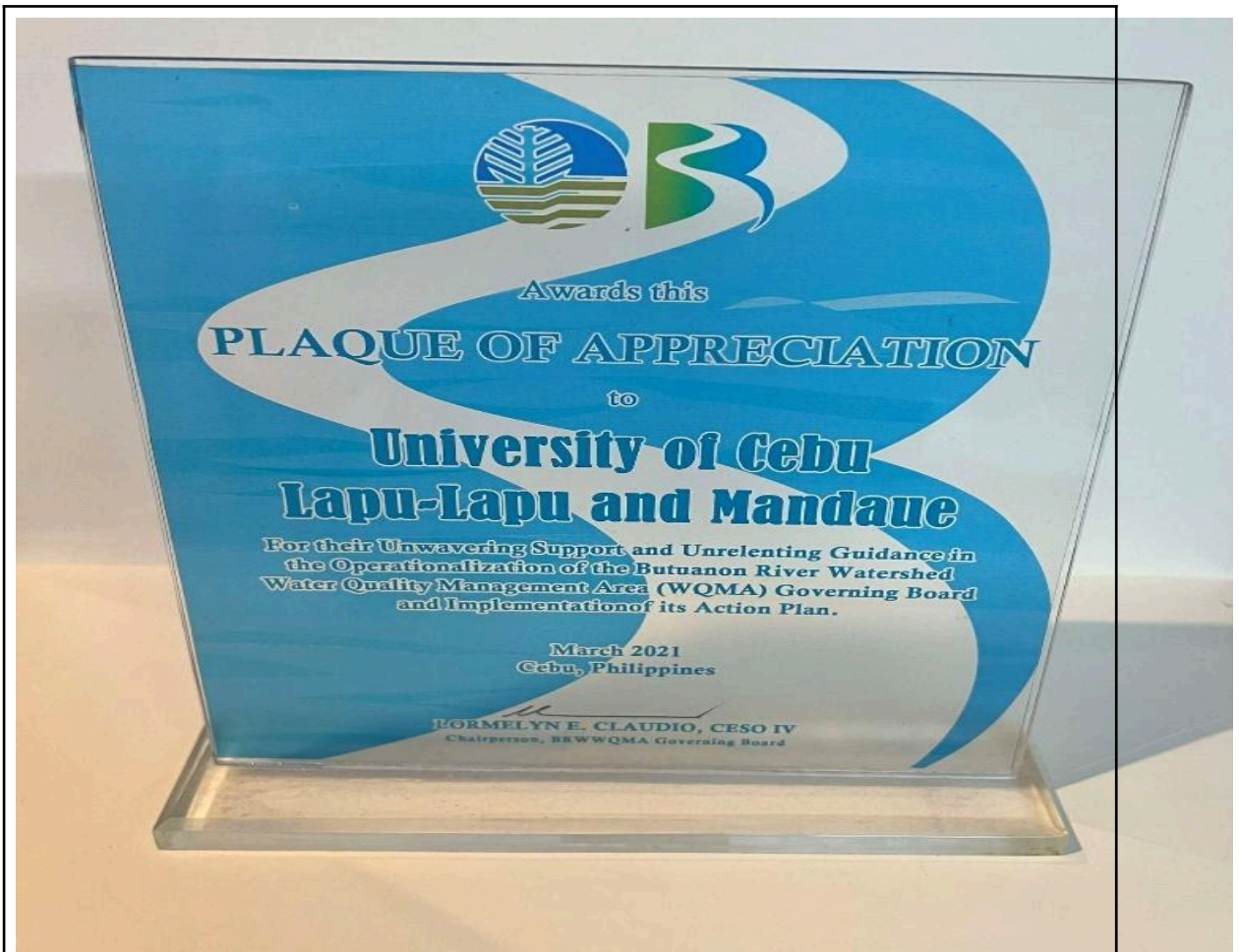
Exploring gendered knowledge and inclusiveness in community resilience for flooding disaster. Case studies in Can Tho City (Vietnam) and Cebu City (Philippines), funded by the Asia-Pacific Network for Global Change Research (2020-2022)

The aim of this study is to take on the exciting and timely opportunity from recent scientific and technological advances and develop an innovative and effective community-based flood risk management strategy to build community resilience to urban flooding from socialist and naturalist perspectives. Specifically, the following objectives are identified: - Understand the key drivers of flood hazards, especially the vulnerable social - hydrological systems and apply a hazard risk analysis framework to quantify flood risk in the case study; - Investigate and understand the historical and cultural implications for gender vulnerability, contemporary resilience building and impacts on socio-economic development; - Adopt a participatory approach to scope a pilot community-based urban flooding management based on qualitative/quantitative data considered as adaptive measures and pathways for enhancing gender inclusiveness and resilience of flood-prone areas, particularly in Can Tho City. - Identify the major challenges in developing community resilience and develop a preliminary approach to measuring community flood resilience. Photo credit by Mr. Nguyen Minh Dang



- Call for Donation- Barangay (Village) Paknaan and other neighboring areas experienced flooding due to heavy rainfall at the mountain area near the Butuanon River source <https://www.facebook.com/photo?fbid=2349310795215109&set=a.1179082838904583>
- Relief goods for the affected victims of the flash flood in Barangay (Village) Paknaan, Mandaue City <https://www.facebook.com/photo/?fbid=2358998960912959&set=a.1179082838904583>
- Turn-over of donations to Barangay (Village) Paknaan, Mandaue City last Thursday, October 15, 2020

<https://www.facebook.com/photo/?fbid=236442223703966&set=a.1179082838904583>



The University of Cebu Lapu-Lapu and Mandaue was recognized by the Butuanon River Watershed Water Quality Management Area (BRWWQMA) Governing Board for the University's active involvement and participation on the different initiatives of BRWWQMA. The Butuanon River Watershed is a Class C water body as classified by the Environmental Management Bureau Region VII (EMB R7), Department of Environment and Natural Resources. This 23-kilometer river is considered navigable waters. During rainy season, the river contributes to flooding in Village Paknaan, Mandaue City, Cebu due to water levels that rise above the river banks due to heavy rains.

7. Pull quotes

"This project is a novel concept, particularly in its examination of the effect of urban flood hazards on gendered vulnerability, adaptation, and resilience in urban areas, including Can Tho City (Vietnam) and Metro Cebu (the Philippines). The research conducted in this project not only contributes to the scientific research communities by providing research outputs and outcomes related to gender research, but also provides novice researchers with the opportunity to enhance their research capacities and local partnerships." – Thai Van Nguyen (Role: project leader).

“This is the first time I've heard about study on gendered awareness in flood disasters in my ward. In general, this research is useful because it allows us to understand the differences between men and women who may encounter and adapt to urban floods. It would be great if the project findings might propose potential solutions for our community to better adapt to urban floods in future.” – A representative of Cai Khe ward of Can Tho City.

“Project Dolphin is a flood hub managed by the University of Cebu Lapu-Lapu and Mandaue and the local government units of six barangays (villages). It is a ray of hope for Disaster Risk Reduction and Management. This hub serves as a vital support office where minds meet to make annual plans and programs, implement strategies and activities, and evaluate our actions related to flooding. Indeed, University of Cebu Lapu-Lapu and Mandaue is a leading educational institution that is committed to its vision to democratize quality education, be the visionary and industry leader, give hope, and transform lives.” – Dr. Mauro Allan P. Amparado.

“With the restrictions imposed by local government units for COVID-19, the research team made adjustments based on the safety protocols implemented. These pandemic protocols did not hinder the data collection of the research, considering that the conventional practices were interfered with. The researchers used strategies to collect meaningful data while continuously ensuring the implementation of guidelines. The residents' survival experiences and stories significantly impact the research project's results. During the Focus Group Discussions, the research revealed vital information about strategies to mitigate the effects of flooding. Community collaboration and participation truly create positive results in times of crisis.” – Dr. Richie L. Montebon.

8. Acknowledgments

We would like to thank the Asia-Pacific Network for Global Climate Research for the funding and the opportunity to conduct this research project. In Vietnam, we would also like to thank the Research Center for Rural Development, An Giang University. Specifically, Mr. Trinh Phuoc Nguyen, Mr. Le Thanh Phong provided the logistical and administrative support for this project. We also wish to thank all regional and local stakeholders, who engage in the projects. In addition, we also would like to appreciate the collaboration efforts of the main project partners from the University of Cebu.

Furthermore, we would also like to thank University of Cebu led by its Chairman Atty. Augusto W. Go, President Ms. Candice Gotianuy, Executive Vice Chancellor Atty. Manuel Elijah J. Sarasad, UCLM Campus Affairs Director Dr. Anna Liza B. Son, Vice Chancellor for Academic Affairs Dr. Yolanda C. Sayson, and Vice Chancellor for Business Development and Innovation Dean Ofelia G. Maña. Our special thanks to the government officials of Metro Cebu (Cebu City, Mandaue City and Lapu-Lapu City), and the government of Can Tho City Vietnam.



9. Appendices

Provide a list of all appendices and attach them as separate files to the report.

No.	Appendices	Research locations
1	The first Stakeholder Workshop on Developing Research Framework and Action Plan	Can Tho City, Vietnam
2	Conducting KIP interviews	Can Tho City, Vietnam
3	Local actors participated in focus group discussion	Phu Hoa and Ke Sach Wards, Can Tho City, Vietnam
4	Conducting household surveys	Phu Hoa and Ke Sach Wards, Can Tho City, Vietnam
5	Fieldwork activities	Metro Cebu, the Philippines
6	Research Article Abstracts – the Philippines team	University of Cebu, the Philippines