

Workshop Proceedings: **From Risks to Resilience through Flood Risk Modeling for Pontianak City**



This brief provides a summary of the workshop on study findings related to Flood Hazard Scenarios for Pontianak City. The content reflects the discussions and outcomes of the workshop and is not intended as official advice or policy recommendations. Any reproduction or use of this content must credit the original source and adhere to applicable copyright laws. For more information, please visit fincapesproject.com.



On November 13–14, 2024, stakeholders from diverse sectors gathered in Pontianak for a workshop titled **“From Risks to Resilience Through Flood Risk Modeling for Pontianak City.”** The event brought together government officials, environmental organizations, academics, and community representatives to address the city’s flood challenges and propose actionable solutions. This article summarizes the critical discussions and insights shared by key participants.

The workshop began with a keynote presentation by **Prof. Stefan Steiner**, who highlighted the importance of integrating scientific data from flood risk modeling into Pontianak City’s decision-making processes. Prof. Steiner emphasized that flood risk modeling is a vital tool for mitigating the impacts of flooding by combining data from meteorology, hydrology, and topography. This approach enables policymakers to identify high-risk areas, optimize resource allocation, and implement targeted interventions. Drawing from global examples—Canada, Jakarta, and the China-Pakistan Economic Corridor—he demonstrated how effective flood modeling informs urban planning, disaster mitigation, and resilient infrastructure. Prof. Steiner also outlined four pillars of mitigation: early warning systems, infrastructure investments, community relocation, and nature-based solutions like peatland restoration.



The session continued with a presentation of key findings from the flood risk modeling study conducted by Syiah Kuala University. The study highlighted the flood profile for Pontianak City, which impacts approximately 84% of the total area. This flood profile includes factors such as geographic conditions, elevation changes, drainage, sea level rise, subsidence, a 10- to 20-year rainfall intensity cycle, as well as heavy rainfall that leads to flash floods, landslides, and widespread flooding in low-lying and flat areas, as well as other factors that contribute to flooding in Pontianak.

Key Findings

The hydrology analysis concluded that several factors contribute to the slow flow of the Kapuas River, including a gentle slope, meandering path, large width and depth, fine sediment deposition, and tidal influence. These factors can lead to prolonged flooding in the area. In addition, this study also projects sea level rise in Pontianak, considering climate change and land subsidence. Using BMKG data and RCP scenarios, it estimates sea levels to rise by 0.8-1.2 cm/year due to climate change. An algorithm incorporating thermal expansion, ice melt, and regional variability projects sea levels to reach approximately 2.00 meters (low emissions), 2.10 meters (moderate emissions), and 2.20 meters (high emissions) by 2124. These findings highlight the urgent need for climate mitigation and adaptation measures in Pontianak, including reducing emissions, investing in resilient infrastructure, implementing nature-based solutions, and promoting sustainable land-use planning.

Key discussants contributed their feedback, focusing on pressing flood issues in Pontianak. **Gusti Zulkifli Mukti** emphasized the impact of extreme climate phenomena, such as El Niño and La Niña, in intensifying rainfall. He pointed out that a single La Niña event in 2020 caused rainfall exceeding 100 mm in one day, overwhelming the city's infrastructure. He also highlighted the disparity between effective historical urban planning by Dutch colonial authorities and the inadequate drainage systems in newer developments, such as those along Jalan Ahmad Yani. **Erlando Koranda, ST., MT, from Public Works and Housing Department of Pontianak City** explained that the city's 600-kilometer drainage network struggles to meet current demands due to poor maintenance and waste management. He cited household and construction waste as significant contributors to clogged drainage systems, exacerbating floods like the one in South Pontianak in March 2024.

Participants also provided feedback and recommendations. **Representative from the Indonesia Statistics Agency in Pontianak City, Siswandi**, proposed creating small water storage areas in low-lying regions to manage excess water and reduce drainage burdens. **NGO representative from WALHI Kalimantan Barat** urged the government to launch public awareness campaigns about reducing plastic waste and improving waste management practices, while representative from **River Basin Authority of Kalimantan 1 in Pontianak** suggested water retention systems to manage drainage outflow more efficiently and reduce water discharge times into the Kapuas River.

The second day focused on academic and community perspectives, beginning with insights from **Rahmawati, local NGO GEMAWAN, Dr. Ely Nurhidayanti from University of Tanjungpura, and Prof. Ella Meilianda from University of Syiah Kuala**, who identified rapid urbanization as a major challenge, reducing natural water absorption areas and exacerbating land subsidence. They emphasized three key parameters for flood mitigation in Pontianak, which are improved spatial planning, increased community participation, and proper drainage system maintenance.

The second panelists highlighted intersectional and inclusive approaches. **Dr. Sri Mastuti, GESI Expert at FINCAPES** stressed the need to incorporate gender equality and social inclusion (GESI) perspectives into flood management. The impact of flood differently for men and women. She pointed out that current flood models often neglect the unique vulnerabilities of women, the elderly, poor men, and marginalized groups. **Imansyah, S.T., M.Eng. from Bappeda Pontianak** focused on collaborative efforts, advocating for contributions from local communities and private businesses. He also recommended exploring community-based financing mechanisms to support local initiatives.



Participants shared further feedback. **Cari Sampah Pontianak Community** criticized unplanned urban development, such as the construction of cafes in alleys and new residential complexes without adequate drainage systems, as contributors to flooding. **Dr. (CN) Dedy Alfian** from University of Syiah Kuala warned about the long-term risks of land subsidence and climate change, including the threat of tidal flooding (*banjir rob*). He also noted the importance to harmonize and synchronize the coordination between local, provincial, and national disaster management authorities.

Proposed Solutions: Key Recommendations

- 1. Modernizing Drainage Systems:** Effective flood management in Pontianak requires a careful approach to drainage development that considers the area's peatland environment. While expanding and maintaining drainage networks is important, excavations in peatland can cause subsidence and worsen flood risks. A balanced strategy should combine strategic drainage improvements with nature-based solutions like rain gardens, natural water retention areas, and peatland preservation. This integrated approach will ensure effective flood management while minimizing negative impacts on Pontianak's unique ecosystem.
- 2. Strengthening Waste Management:** Install more waste bins, raise public awareness about proper waste disposal, and enforce waste management regulations.
- 3. Nature-Based Solutions:** Restore peatlands and mangroves to enhance water retention and combat land subsidence.
- 4. Community-Based Approaches:** Empower local communities to participate in waste management, drainage maintenance, and flood preparedness.
- 5. Collaboration Across Sectors:** Foster partnerships among governments, private sector actors, and community organizations for sustainable flood management.
- 6. Mainstreaming Gender Equality and Social Economic Inclusion into flood management:** Using GESEI lens in vulnerability modelling and vulnerability analyze. Identify the resilience capacity of women and other marginalize groups on responding to flood disaster.

The workshop highlighted Pontianak's flood challenges and explored solutions through improved infrastructure, nature-based approaches, and inclusive community involvement. Tackling these issues requires collaboration from all stakeholders, making this event a vital step toward creating a safer, more sustainable, and resilient Pontianak.

About FINCAPES

The Flood Impacts, Carbon Pricing, and Ecosystem Sustainability (FINCAPES) project is a collaborative, gender-responsive initiative funded by Global Affairs Canada. Over a 5.5-year period, jointly undertaken by the University of Waterloo's Faculty of Mathematics and Faculty of Environment, the project supports Indonesia in adapting to climate change, mitigating its impacts, and conserving biodiversity in a socially and economically sustainable manner. Aligned with Indonesia's priorities, FINCAPES enhances the nation's capacity in key areas: forecasting and mitigating financial impacts of climate-change-induced floods, promoting Nature-based Solutions for peatland and mangrove restoration, and strengthening climate finance policy frameworks with a focus on carbon financing mechanisms.

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