Beyond the Mega-Dike:

What Cagayan de Oro Teaches Us About Climate Change Adaptation and Maladaptation

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The Philippines often ranks at the top of global indices for disaster and climate risk—an undesirable position in a contest no country wishes to lead. Due to its geography and exposure to various geophysical hazards, the nation frequently encounters extreme weather events and climate-related dangers. Among the most devastating was Tropical Storm Sendong (Washi), which hit in December 2011. Following this event, Cagayan de Oro City (CDO) became a stark symbol of climate vulnerability and the urgent need for adaptation—not a future goal, but an immediate priority.

Sendong killed 1,292 people, left over 1,000 missing, and affected nearly 700,000 individuals. Entire riverside communities were wiped out overnight, while many more were displaced or lost their livelihoods. The storm prompted a realisation: climate change is no longer a distant threat but an immediate and serious danger happening now.

Infrastructural Adaptation: FRIMP-CDOR

In response to the disaster, the national government initiated one of its most ambitious climate adaptation schemes: the **Flood Risk Management Project for the Cagayan de Oro River (FRIMP-CDOR)**. Supported by the Japan International Cooperation Agency (JICA) and carried out by the Department of Public Works and Highways (DPWH), the project centred on large-scale infrastructure, including a 12-kilometre dike system, retaining walls, floodgates, and drainage systems—all designed to reduce flood risk with a 50-year return period in mind.

However, the project came with a cost. Thousands of residents were relocated from high-risk areas to resettlement sites often far away from their homes, communities, and livelihoods. While the dike aimed to protect the city from future flooding, it also raised important questions:

- Has FRIMP-CDOR made CDO more secure—and for whom?
- Has it genuinely reduced vulnerability?
- Have well-meaning efforts to adapt to climate change instead created new vulnerabilities, including displacement, dispossession, and increased inequality?

Enter the CiCADD Project

This is where the **CiCADD Project**—*Climate Change Adaptation, Dispossession, and Displacement*—comes in. As part of a multi-country research initiative spanning Asia and Africa, CiCADD identifies Cagayan de Oro as a paradigmatic case for understanding both the promise and peril of climate adaptation. The project explores how, under what conditions, and for whom adaptation efforts reduce vulnerability or—conversely—lead to **maladaptation**, which the IPCC (2001) defines as "an adaptation that does not succeed in reducing vulnerability but increases it instead."

Our research investigates whether adaptation strategies improve resilience and adaptive capacity—or result in unintended consequences, particularly displacement and dispossession. CDO provides an ideal lens to explore these dynamics in the real world.

Understanding the Heart of the Research

The CiCADD team seeks to understand how climate change adaptation measures—however good intentions—can inadvertently damage the very communities they aim to help. In CDO, relocating communities from riverbanks to distant settlements changed social, economic, and cultural environments. Livelihoods were affected, social bonds were strained, and local knowledge systems were displaced.

We ask:

1. **What are the unintended consequences of climate change adaptation interventions in CDO?**
   Do large-scale infrastructure projects like the mega-dike inadvertently lead to loss of livelihoods, fragmentation of social networks, or lack of access to essential services?
2. **How do adaptation efforts contribute to gendered and intersectional processes of displacement and dispossession?**
   Are certain groups—such as women, informal

settlers, low-income families, or Indigenous peoples—more negatively impacted than others?

3. **What intersectional factors shape how adaptation outcomes unfold?**
   How do class, gender, ethnicity, and land tenure status affect whether people benefit, are burdened, or experience both?
4. **How can we assess the impacts of displacement and dispossession?**
   Beyond physical relocation, what emotional, economic, cultural, and spatial losses are experienced?
5. **Specific to CDO: What were the unintended and gendered consequences of infrastructure-based adaptation measures like the mega-dike?**
   How did displacement and dispossession occur, and who was the most affected by infrastructure-based adaptation?

FRIMP-CDOR on the Ground: What Our Mapping Revealed

As part of CiCADD's initial research, our team conducted fieldwork in several *barangays*—local administrative districts—affected by the FRIMP-CDOR project. These included Balulang, Consolacion, Macasandig, Carmen, Puntod, and Barangays 13 and 17. We also visited resettlement areas such as Macapaya, Pahiron-722, and Pahiron-NHA. We spoke with residents and key stakeholders, including local government officials and planners.

Our preliminary findings reveal a complex picture of adaptation and maladaptation. While the dike infrastructure reduced flood risks in certain areas, it also caused the forced relocation of residents to remote sites with inadequate services. Many relocation areas lack essentials such as reliable water, paved roads, schools, and sustainable livelihoods. Some housing units remain vacant or only partially used, as residents must return to their former neighbourhoods to earn a living.

In addition, our preliminary findings suggest there is an:

- Increased social tensions and crime
- Inadequate community engagement in planning and decision-making
- Uncertainty around land tenure and housing rights

These findings suggest that adaptation efforts, while reducing some risks, may have created new vulnerabilities—an outcome indicative of maladaptation.

Adaptation, But for Whom?

The story of CDO is not one of failure but of valuable lessons. It highlights that climate adaptation is not politically neutral. It needs to go beyond technical and infrastructural solutions to address social realities and equity issues on the ground. A dike may protect against rising waters, but can it be deemed 'successful' if it displaces and dispossesses already vulnerable communities at the same time? Or if it merely shifts environmental risks elsewhere?

By identifying CDO as a CiCADD case study, we are invited to rethink what 'successful' adaptation truly means—not just in terms of engineering outcomes, but also in terms of justice, equity, and human dignity.

As political ecologist Jesse Ribot has argued, an understanding of vulnerability that ignores local social dynamics cannot foster resilience; it must be grounded in local contexts, inclusive governance, and community-led solutions. Therefore, the resulting adaptation actions should not only promote and safeguard infrastructure but also empower individuals and enhance their adaptive capacities and climate resilience. More importantly, these actions must reduce vulnerability and do not create new ones. They should also be fair, just, and effective.

Pictures: *Taken by the Philippine CiCADD team except for the drone shot taken by Trip ni Tonio*
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