

Article

Linking Disaster Risk Reduction and Climate Change Adaptation through Collaborative Governance: Experience from Urban Flooding in Jakarta

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Abstract: This paper examines the challenges of and facilitating strategies for linking disaster risk reduction (DRR) and climate change adaptation (CCA) in addressing urban floods, drawing from Indonesia's experience. The fragmentation between efforts to implement DRR and CCA leading to unnecessary duplication could increase confusion at both the community and wider governance levels and reduce the effectiveness of urban flood management. Through the lens of collaborative governance, this paper analyzes the barriers for integrating DRR and CCA and options to better align their practices in the context of a megapolitan city, Jakarta, Indonesia. The key findings of this study confirmed that institutional fragmentation, in concert with inconsistent facilitation and collaboration mechanisms, were the strongest barriers to aligning DRR and CCA action. The absence of accountable leadership was a key impediment for successful partnership-building processes to support political and technical collaboration. Leadership in these contexts plays an important role in (1) developing sustainable relationships, (2) convincing potential stakeholders to collaborate, (3) persuading partners to commit to sharing resources, and (4) agreeing/sharing a common vision of the partnership actions needed to mitigate harm and reduce urban vulnerability. These factors are critically important for reducing the direct and indirect impacts of flooding in Jakarta. Such lessons from Indonesia on linking DRR and CCA offer valuable insights to inform the development of policies and strategies to deal with urban floods for global cities faced with similar challenges.

Keywords: collaborative governance; urban flooding; climate change adaptation; disaster risk reduction; Jakarta



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1. Introduction

Jakarta is a mega city, which is facing increasing and serious flood risks associated with climate change, rapid urbanization, and a range of social and environmental threats [1–3]. As such, there is a pressing need to develop and implement effective strategies to reduce flood damage and enhance Jakarta's resiliency to flood impacts [4].

Previous studies have emphasized the importance of linking actions from disaster risk reduction (DRR) and climate change adaptation (CCA) [5–8]. Conceptually, DRR and CCA represent two different fields of knowledge and theoretical approaches, and, in contemporary governance contexts, represent separate policy agendas [9]. DRR deals with ongoing operational issues to reduce exposure and vulnerability and enhance preparedness around both human-induced and natural disasters [10], while CCA deals with making adjustments within society to limit the adverse impacts of climate change and climate-related disasters [11].

Despite an obvious link between DRR and CCA, and their complimentary sets of useful and relevant skills, in practice, collaborative partnership between the two fields is

difficult and in most cases they work in isolation [12]. This lack of collaboration could negatively impact the quality of urban flood management, while confusing the community and wider government through unnecessary duplicated efforts [7,13]. A useful means of achieving multisectoral collaboration between the two fields, as suggested by the literature, is through applying the collaborative governance conceptual framework.

This paper describes our study, which examined the challenges and facilitating factors for linking DRR and CCA efforts through the framework of collaborative governance, drawing from Jakarta's experience of dealing with floods. This knowledge can inform strategy development for managing floods. This paper will first provide a brief background to the study including a description of Jakarta's floods and flood risk management; an explanation of the need to integrate DRR and CCA; and a discussion of the utility of a collaborative governance framework. After describing the study's methods, it will present its findings, focusing on the barriers to collaboration and recommendations on the way forward.

2. Background to Study

2.1. Jakarta, Floods, and Flood Risk Management

Jakarta is the most populous city in Indonesia. In 2020, the population of Jakarta was estimated at around 10.56 million [14]. It is projected that the population of Jakarta will exceed 11.4 million by 2035 [15]. Many researchers have suggested that the biophysical environment of Jakarta will further deteriorate with population increases [3,16,17].

Jakarta has a long history of devastating floods. Since the 17th century, flooding has been one of the top issues of concern. The oldest flood record was from 1621 when most of the city was under water, causing extensive economic loss to the Dutch Colonial government at that time [18]. Understanding this historical data is important to inform flood mitigation and risk reduction in Jakarta, as suggested by researchers [19]. Recent studies have further suggested that climate change and changing urban environmental conditions create additional challenges to urban flood management in addition to and quite separate from concern about coastal flooding and sea level rise.

As has been stipulated in the recently launched Act Number 3 of 2022, concerning the State Capital, Jakarta will lose standing as the national capital within the next 5 years with a new city planned for construction in East Kalimantan [20]. Irrespective of this change, flooding will remain a major problem requiring urgent attention in Jakarta [2]. See Figure 1 to locate Jakarta and East Kalimantan in the Indonesian map.



Figure 1. Map of Indonesia [21].

Aside from natural phenomena (such as climate and geomorphology), there are a number of underlying factors related to human activities that increase vulnerability to flooding. These factors include rapid urbanization [22], land subsidence [23], changes in land use without proper planning (e.g., human settlements in flood-prone areas) [24], and mismanaged solid waste disposal practices within communities [25].

Numerous strategies have been planned and implemented in Jakarta to reduce the impact of urban flooding. A major example is the National Capital Integrated Coastal Development (NCICD) megaproject launched in 2014. This multi-billion-dollar project aims to structurally protect Jakarta from sea level rise and reduce the effects of subsidence in urban settings through the construction of a 32-kilometre offshore sea wall and the reclaiming of 5100 hectares of land [26]. This sea wall component of the project is controversial as some authors have argued that it could trigger environmental problems such as a reduction in the stream flow in river systems and the accumulation of sedimentation in nearby estuary areas [27]. Other critical voices have referred to the sea wall project as being opportunistic and targeting short term concerns: a form of disaster opportunism [28].

Local and regional climate patterns are projected to increase the likelihood of rainfall events, flooding, and environmental uncertainties generally, all of which complicate existing flood risk management policies and practices [29,30]. A wider context is that the disruption of riverine and urban flooding coexists and is exacerbated by oceanic sea level rise and underlying geomorphological weaknesses. Reliance solely on traditional flood defense approaches were not sufficient to handle this complex urban flood risk [31].

2.2. DRR and CCA Integration and the Need for Collaborative Governance

The importance of collaboration between DRR and CCA has received global attention since the United Nations Climate Change Conference in Bali in 2007 [13]. In addition to this, the concluding remarks from the recent Global Platform for Disaster Risk Reduction in 2022 also call for much greater multi-stakeholder collaboration to tackle systemic risks [32].

Many studies have been published to demonstrate the advantages of integrating these two approaches into a community resilience building program. Advantages include the following: (1) improving the comprehensiveness of the understanding of risk and vulnerabilities [33,34]; (2) providing an integrated framework to build resilience to the impacts of climate extremes and disasters [35,36]; (3) strengthening coordination and engagement between the stakeholders involved [5,37]; (4) improving the information and knowledge base for decision making processes [37–39]; (5) promoting efficiency and effectiveness in resource management [40,41]; (6) enabling a collaborative and cross-sector learning environment [42,43]; (7) developing no-regret solutions and robust adaptation options [44,45]; and (8) improving disaster risk management strategies [31,46]. Notwithstanding these key attributes, the options to enhance collaboration between different agencies responsible for DRR and CCA require guidance on strategic alignment: the need for such direction has been affirmed by many authors [47–49].

Emerson and Murcuie suggest that the application of the concept of collaborative governance provides decision makers an approach to deal with the ‘wicked’ practical and policy challenges of climate change [50], and, in particular, the complicated convergent mitigation choices referenced above.

There is limited consensus, however, on defining which attributes are best nor how they might be effectively combined in the widely variable literature. Ansell and Gash, for example, define collaborative governance as a governing arrangement where one or more public agencies directly engage non-state stakeholders in a collective decision making process that is formal, consensus-oriented, and deliberative, and that aims to make or implement public policy or manage public programs or assets [51].

In response to this definition, Emerson et al. have argued that the definition of collaborative governance should capture a ‘fuller range of emergent forms of cross-boundary governance’ [50]. Emerson et al. point out that collaborative governance should be defined as the process and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private, and civic spheres to carry out a public purpose that could not otherwise be accomplished [50].

Emerson et al. further demonstrate that the central enabler of a collaborative governance mechanism is the dynamic interaction of key factors. They argued that this

‘collaboration dynamic’ consists of factors that enable and incentivize the establishment of the functional arrangements that enable effective governing and collaboration.

Depicted in Figure 2, these factors include (1) the principles of engagement (discovery, definition, deliberation, and determination), (2) shared motivation (mutual trust and understanding, internal legitimacy, and share commitment) and (3) the capacity for joint action (institutional arrangement, leadership, and knowledge) [50].

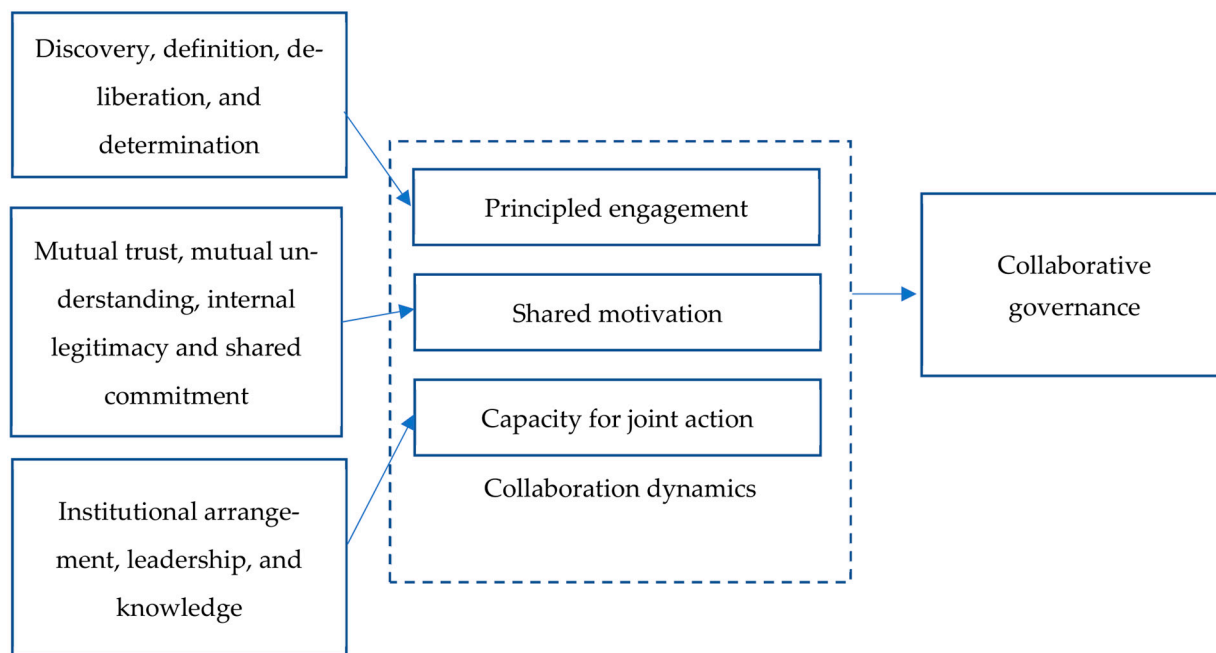


Figure 2. Collaboration dynamics and drivers of collaborative governance (adapted from [50]).

The dynamics and enabling elements shown in Figure 2 frame the enquiry detailed in this study. The purpose of this analytic frame is to support the identification of the barriers for collaboration between DRR and CCA stakeholders, and the alignment of strategies and practices that, when applied in unison, enhance institutional capabilities to govern flood resilience in Jakarta.

3. Methods

Several data collection methods were applied in this work. These include in-depth interviews with key informants, a document and literature review, and observation of a series of meetings to develop the Jakarta Disaster Management Planning and related Jakarta Adaptation Planning documents. A multi-lensed approach was ideal for appreciating the complexity of the governance and alignment challenges for defining optimal governance arrangements to enhance flood mitigation in Jakarta.

To identify the key stakeholders relevant to this study, we approached two main government agencies: the Provincial Disaster Management Agency (BPBD) and Provincial Environmental Services Agency (DLH), who are responsible for DRR and CCA, respectively. We then applied a snowball method to recruit the key informants. With this method, we recruited 26 key informants. These key informants represent government agencies, private organizations, multi-platform institutions, international organizations, donor agencies, Red Cross Red Crescent, research institutions, universities, non-government, and community-based organizations. All these institutions are actively involved in preparing for, responding to and recovering from flooding in Jakarta: as per each institution’s capacity and operational mandate.

In addition to informants drawn from these agencies, a total of 26 key stakeholders were selected for detailed interviews. They included individuals from non-government

organizations, private organizations, international organizations or donor agencies, the Red Cross Red Crescent Movement, academia, and community-based organizations. All of these institutions are actively involved in preparing for, responding to, and recovering from flooding in Jakarta, as per each institution's capacity and operational mandate.

Thematic analysis was carried out using Emerson et al.'s collaboration dynamics framework to pattern findings on barriers to effective cross-agency collaboration. The first author has a published previous document related to this research project [52], the current paper presents more updated information, particularly the related key government policies and regulations.

4. Findings and Discussion

The three main components within the collaboration dynamics frame were used to group the identified barriers to effective collaboration. These are (1) principled engagement, (2) shared motivation, and (3) the capacity for joint action. Figure 3 details ten specific sub-components (hurdles) mapped against these main barriers. Each of these are examined and discussed in detail in the following section.

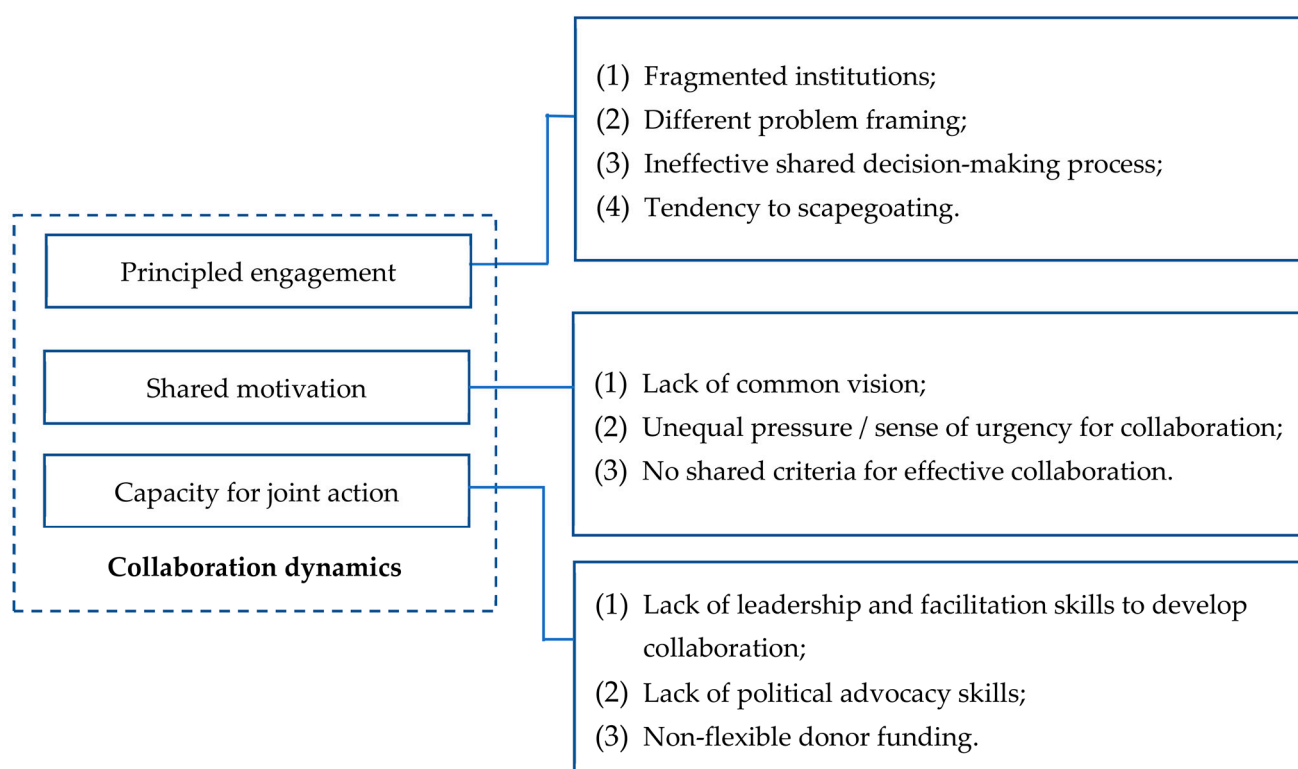


Figure 3. Identified barriers for DRR and CCA integration using collaborative dynamic approach in Jakarta.

4.1. Barriers Related to 'Principled Engagement' Component

As suggested by the title of the element, this component is an important foundation for positive interactions amongst the stakeholders. Specific issues were found, such as fragmented coordination among institutions, differences in problem framing, ineffective shared decision making processes, egocentrism, and a tendency for scapegoating.

a Fragmented institutions

The fragmented institutional effort of city agencies is an issue for DRR and CCA integration. Each approach is coordinated by two different parts of government, applying different methods, plans of action, and priorities. The key informants believed that a

sectoral approach without clear guidance or policy to support cross-sectoral actions will reinforce working in ‘silos’. The following statement by one of them explains this view:

“Agencies are fragmented. Coordination line does not work. Integration between DRR and CCA is easy in theory. But in practice, we must deal with institutional arrangements. This is not an easy task both at national and provincial arena.”

Previous studies have also suggested that building community resilience against flooding in Jakarta should involve a multidimensional approach (integrating technical, financial, natural, and financial controls) but also has to be centered upon human and social aspects to achieve an optimum transformational capacity [4]. Despite findings and significant support in the literature, the implementation of policies and practices for building community resilience is still impeded by a sectoral and fragmented approach. This lack of alignment leads to disconnected policies and disharmony between different institutions.

b Different problem framing

There are well-documented gaps in institutional coordination on environmental impact issues that are exacerbated by fundamental differences in problem definition, leading to impediments to how solutions are conceived and developed [49,53]. Informant sources detailed that actors from both the DRR and CCA arenas each frame the solutions differently because they have different areas of legislative jurisdiction. The informants further suggested that most DRR stakeholders are policy practitioners, while CCA stakeholders are evidence-based researchers, each with potentially very different approaches to the same problems.

A national NGO informant with expertise in DRR added that the priority for a provincial government is to save its people from the impacts of flooding and they must do it as an emergency response.

“People cannot wait until the scholars complete their research and assessment; the government should do something to save its own people from flooding. Flooding is already happening right now”.

In contrast, a climate change researcher explained that adaptation measures can only be implemented upon the completion of climate vulnerability and impacts assessment, suggesting detailed analytical findings must be reported ahead of action.

“To design adaptation planning, we need to complete climate vulnerability and risk assessment first, before we can do any activities at the community level”.

c Ineffective shared decision making processes

While it is important to detail different approaches and the preferred modes of operation with respect to flood mitigation, informants acknowledged that there were efforts to include agencies from across government sectors in the processes of the development of both the Jakarta Disaster Management Plan 2013–2017 (led by the Disaster Management Agency) and the Jakarta Adaptation Plan 2013–2017 (led by the Environmental Agency).

A limitation acknowledged by the respondents was that, in many cases, there was an unbalanced mix of senior and junior participants in the planning meetings with only a few agencies sending their key people as representatives. Most of the time, the representatives of key agencies had limited experience and may not have had decision making authority on behalf of their organizations. An informant working in the disaster management sector expressed his concerns as the following:

“We expected that they would send people who could represent their organization, who understood the problem and would be able to provide inputs and ideas. The fact is that agencies like to send new staff that did not meet these criteria”.

Furthermore, this research identified that the *Jakarta Disaster Management and Jakarta Adaptation Plans* were developed in parallel without an effective mechanism for cross-referenced supporting options and implementation strategies. There were no members in common between the planning groups for each document.

d Scapegoating between different sectors

A key factor in complex governance settings as reported by Dietz, is the variable degrees of mutual trust between the different actors and sectors that invariably lead to disputes [54]. In addition to the presence of factors such as fragmented approaches to operating and differences in problem framing, there is a tendency for DRR and CCA actors to be inward-looking and blame others for inactivity in areas each group deems the other to be passive in. For example, a key informant from the CCA group critiqued a provincial disaster management-related institution for not being able to be proactive in attempting to mitigate flood risk.

“The problem is that they (disaster management people) cannot do something until the disaster occurs. From what I know, they mostly act during emergency period. Their money can only be used for response”.

Conversely, a disaster management government respondent blamed the environmental management agency in Jakarta for not being able to enforce the law to prevent environmental destruction, which in turn exacerbated flood impacts in Jakarta.

“This is fully their responsibility. They are the one who make the regulation but not willing to force them. Environmental destruction due to unplanned or illegal development activities is unstoppable now”.

4.2. Barriers Related to ‘Shared Motivation’ Component

The second element of the collaboration dynamics frame focusses on the motivation between DRR and CCA actors. This study identified several potential barriers related to this component. They are (1) the lack of common vision; (2) unequal pressure/sense of urgency for collaboration; and (3) no shared criteria for effective collaboration.

a Lack of common vision

Markwell et al. have suggested that having a common vision is one of the key elements of partnership and collaboration building [55]. Although many conceptual studies have reported that both DRR and CCA approaches aim to reduce vulnerability and build resilience [6,56], in the practical arena, the key informants admitted that there is a need to develop or declare an agreement on a common vision amongst DRR and CCA stakeholders for building community resilience against flood exposures in Jakarta.

“...we have no common vision, so we see things differently...”.

Without a common vision, there is likely to be confusion among the key informants as to what exactly the roles and responsibilities of other sectors/agencies were or even should be in relation to building flood resilience. A key disaster management informant admitted that he had little knowledge of the roles and responsibilities of the Jakarta Environmental Management Agency except for a small number of very public activities:

“I am not quite sure about what are they doing in regard to building community resilience to flood risks. All I know is that they do tree plantation program for adaptation and Sunday car free day program to limit emissions”.

Conversely, a key informant from the adaptation stream indicated that the roles and responsibilities of the Jakarta Disaster Management Agency (BPBD) in relation to building flood resilience were no more than emergency response activities such as the distribution of relief items.

b Unequal sense of urgency for collaboration

Previous studies confirmed that knowledge gaps amongst different sectors can block the process of collaboration and lead to the dominance of knowledge/view points by a single agency [57,58]. In the context of DRR and CCA integration in Jakarta, the key informants suggested that some key stakeholders did not have the same levels of knowledge regarding climate change as a threat factor for increased flood risk in Jakarta.

“Though there has been a lot of propaganda about climate change and the need for collaboration with other sectors, policy makers still see climate change adaptation as something that is still far away, while there are too many things that are more urgent to be prioritized”.

Another informant suggested that an unequal sense of urgency for collaboration is because CCA is relatively new in comparison with disaster risk management issues, particularly for governments at a provincial level. An NGO informant also highlighted the unequal urgency/acknowledgement of the issues between the national and provincial level. They also pointed out that many other important local issues (e.g., solving traffic congestions) have diverted local decision makers from the need for enhancing collaboration between DRR and CCA practitioners.

Although the need to adapt to a changing climate has started to receive serious attention at a national level, this is not always the case at the provincial level.

“The rhyme is different between national and provincial. Most of the discussions about the need to integrate DRR and CCA were at national level not local. Many of the decision makers here don’t see that as a need”.

c No shared criteria for effective collaboration

Leach, Pelkey, and Sabatier argued that the definition of clear criteria for effective collaboration is crucial, particularly for setting standards and procedures and evaluation mechanisms [59]. Successful collaboration should be conceptualized and ultimately evaluated in several ways; for instance, by how well the partners work together in addressing joint aims and the long-term sustainability [60]. We found there was no common agreement upon the criteria to evaluate the effectiveness of the integration between DRR and CCA in Jakarta.

“Well, even though there was collaboration work between DRR and CCA, we have no criteria to evaluate the effectiveness of integration between DRR and CCA. These criteria need to be agreed by all stakeholders”.

4.3. Barriers Related to ‘Capacity for Joint Action’ Component

The third Collaboration dynamic factor focuses on the enablers of joint action. This study found three key issues impacting on the capacities to align collective action: (1) the lack of leadership and facilitation skills to develop collaboration, (2) lack of political advocacy skills, and (3) non-flexible donor funding.

a Lack of leadership and facilitation skills to develop collaboration

Previous studies strongly confirmed that leadership and facilitation skills are fundamental for the collaboration process [61,62]. We found issues related to the lack of leadership and facilitation skills to develop collaborative work between DRR and CCA officials.

The most consistently identified issue related to this barrier was the lack of a mandate or explicit requirements to lead a collaborative process. The informants were adamant about this issue.

“Who is mandated to take the lead to do this collaboration work for community resilience building? The answer is no one. No one plays the role as a watchdog for this collaboration efforts between DRR and CCA”.

And from a provincial government respondent:

“With a clear mandate, we could have a better position to coordinate the adaptation initiatives of all sectors”.

In addition to this, a provincial development agency informant argued that Perda, or provincial regulation, is important for collaborative actions to build resilience by legally binding all agencies to work as planned.

“As this is at a provincial level, Perda (Provincial Government Regulation) is indeed important. Without Perda, we cannot expect too much that they will do something, especially to do the collaboration actions that we are talking about. Without Perda, there will be no budget allocation”.

A key informant from a disaster management agency also confirmed that there is no specific mechanism for communication and dialogue between relevant institutions in the context of building urban community resilience. The mechanism for coordination and communication was established successfully only for emergency responses, indicating that it can be achieved if the right conditions and motivations exist.

“We have a specific coordination and communication mechanism to respond to emergency management, but we don’t have one for prior to the disaster phase. Efforts to build community resilience are implemented separately in each agency”.

Simanjuntak, in his study, also reported that the lack of communication between key stakeholders at provincial and district levels has delayed the implementation of relevant activities to reduce the risks of flooding [63].

b Lack of collaborative political advocacy

Griffiths argued that the development of multi-agency collaboration is influenced by politics [64]. He further explains that the level of advocacy to promote collaboration will influence the political support for each stakeholder to collaborate.

In Jakarta, DRR and CCA integration was mostly discussed in academic discussions but not in policy and governance discussions, which in turn limits opportunities for policy makers to engage with issues and dialogue.

“Mostly, the discussion about DRR and CCA collaboration was only amongst the researchers. No concrete follow up was taken after that”.

Another indication of the missing collaboration between the field of DRR and CCA is reflected by the composition of the steering committee members of the BNPB, which consists of 9 professional representatives and 11 from different government line ministries, but not the Ministry of Environment and Forestry [65]. This is quite concerning as the steering committee has a role to provide inputs to the Head of the BNPB regarding disaster management governance.

In addition to this, the lessons learned from the recent COVID-19 response also shows the need for greater multi-sector collaboration and effective cooperation between the local, provincial, and national level to tackle and prevent crisis. The COVID-19 task force was formed with strong collaboration between the health and disaster management sector [66], recognizing the importance of cooperation between national level government agencies (ministries) and local government as well as with the local communities [67].

c Non-flexible donor funding

Access to funds was a clear finding of importance. A finance institution that often provides funding for both DRR- and CCA-related projects or activities in Jakarta pointed out that extant guidelines for sourcing funding for developing adaptation or disaster risk reduction measures are sometimes not flexible, which results in activities that are also rigid and unable to adjust to local (recipient country or local setting) needs.

“Adaptation and disaster risk reduction are using different sources of budget or donor. This could hinder the process of collaboration as they use different terminologies and aim at different targets”.

An NGO informant suggested that strict donor rules for the scope of funded activities might also be related to the politics of climate change:

“Sometimes the donor does not allow us to say anything related to climate change in our disaster risk reduction project”.

Satterthwaite commented that “flexible finance allows people to do more, and also supports learning about how people on the ground understand their risk exposure and develop their own responses” [68]. Handmera et al. have pointed out that donor priorities do not always link to the local needs [41].

4.4. Moving Forward: Establishing Foundation for DRR and CCA Collaboration

Findings from this research suggests that addressing flood mitigation needs in Jakarta via achieving ‘collaborative governance’ between DRR and CCA active agencies is a difficult goal. This is mainly due to issues around principled engagement, shared motivation, and the capacity for joint action, as discussed above. These findings are consistent with that of Dias et al., who found, at a global scale, many chaotic institutional factors limiting alignment between DRR and CCA [69], and with Matczak and Hegger, who reported the importance of governance strategies to improve flood resilience [70].

To move forward, we need to establish a structure for enabling DRR and CCA collaboration. The ‘building bricks’ for this foundation exist already but need to connect both political and technical pathways for DRR–CCA collaborations and are likely to require an authorizing environment from the highest political levels.

Figure 4 suggests a proposed framework to facilitate collaborative governance and to break the existing siloed approach between DRR and CCA in Jakarta. The involvement of both national and local level government is required to ensure the political and technical solutions for DRR and CCA to collaborate. A political advocacy approach is needed to convince key decision leaders and to amend key policy documents to create a supportive environment and a means for the collaboration. A technical approach, at a minimum, requires access to effective risk and vulnerability assessment processes used across the government.

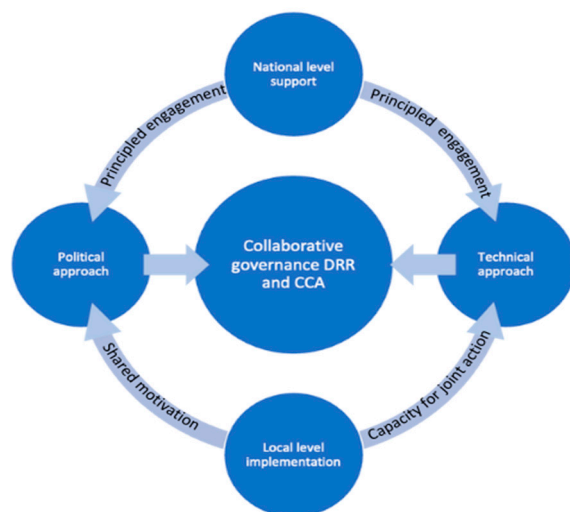


Figure 4. Proposed framework to facilitate collaborative governance of DRR and CCA.

The required components of collaborative and dynamic principled engagement, shared motivation, and the capacity for joint actions are also reflected in Figure 4. Regarding principled engagement, at the national level, a helpful guide exists in the form of Presidential Regulation (Perpres) No 87 of 2020, defining the Master Plan of Disaster Management 2020 to 2044. This regulation enables synergies between DRR and CCA by taking guidance from the United Nations Framework Convention on Climate Change (UNFCCC), Sustainable Development Goals, and Sendai Framework for DRR [71]. The amenity of having a presidential guide is viable, but the enforcement of its guidance by parties regarding flood management may remain a challenge to overcome.

An additional element of high-level support could be to enhance political support by amending BNPB Regulation No 8 of 2022 to expand the membership of the Steering Com-

mittee of Disaster Management Governance by at least adding the Ministry of Environment and Forestry to the steering committee. Government Regulation No 22 of 2021, concerning the Governance of Environmental Protection and Management, clearly states that disaster events could trigger environmental changes, and thus, environmental preservation aspects must be embedded within disaster management governance.

As for shared motivation, there was an informal consensus among the respondents that the developmental agenda is a ‘crossroad’ for DRR and CCA stakeholders. Therefore, we recommend three development documents be promoted to define the shared motivation for DRR–CCA collaboration at the national and provincial levels.

The first key developmental document is the National Long-Term Development Plan (RPJPN) 2025–2045 which will be enacted as a national act. The RPJPN details six policy themes under the sub-heading ‘Resiliency against disaster and climate change’. The six enabling themes are (1) renewable energy, (2) land and forest rehabilitation, (3) the development of grey infrastructure and nature-based solutions for tsunami and sea water inundation prone areas, (4) climate-smart agriculture, (5) the establishment of resilient logistic and supply chain infrastructure to tackle disasters and climate change impacts, and (6) establishing integrated multi-hazard early warning systems.

In addition to the intended RPJPN, the developmental plan the RPD (Provincial Development Plan) 2023–2026, and the RTRW (Spatial and Regional Planning) 2030 also contributes to the enabling of the mainstreaming of both DRR and CCA approaches into these two key developmental documents, especially on the coverage of disaster risk-informed urban development, restriction of soil water extraction to avoid land subsidence, green spaces, and disaster contingency planning.

In terms of the capacity for joint action, as a starting point, we recommend creating a data sharing mechanism between the Ina RISK system, which is a disaster risk assessment platform managed by the BNPB, and the SIDIK system, which is a vulnerability assessment platform coordinated by the KLHK. The deliverables of SIDIK are regional vulnerability mapping, which includes disaster and climate risk assessments plus socio-economic and demographical data and related information. This joining will also allow regional governments to incorporate mapping data into regional development planning, a key aspect of coordinating DRR and CCA capability.

5. Conclusions

This paper has examined the barriers to the effective collaboration between stakeholders working to implement DRR and CCA policies and practices addressing flood mitigation in Jakarta through the framework of collaborative governance. The key findings in this study confirmed that institutional fragmentation, in-concert with inconsistent facilitation and collaboration mechanisms, were the strongest identified barriers to aligning DRR and CCA action. To overcome these barriers, both political and technical solutions are needed. The absence of accountable leadership was a key impediment to successful partnership-building processes supporting both political and technical collaboration. Leadership in these contexts play an important role in developing sustainable relationships and convincing potential stakeholders to collaborate, to persuade partners to commit to sharing resources, and to agree and share a common vision of the partnership actions needed to mitigate harm and reduce urban vulnerability. These are critically important for reducing the direct and indirect impacts of flooding in Jakarta. Such lessons from Indonesia in linking DRR and CCA offer valuable insights to inform policies and strategy development to deal with urban floods by global cities faced with similar challenges.

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