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Review

Review of the Relationship Management Strategies for Building Flood Disaster Resilience through Public–Private Partnership

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Abstract: Relationship management is critical in public–private partnership (PPP), especially when the PPP concept is adopted to build community flood disaster resilience. In this regard, this study aims to conduct a systematic review to explore the relationship management strategies for using public–private partnership to build community flood disaster resilience. A systematic literature review was conducted to retrieve relevant publications related to the subject area. Through a thorough three-stage search using Scopus, a total of twenty-nine relevant journal articles were selected for analysis. From the review, a total of twenty-eight individual relationship management strategies for building community flood disaster resilience using PPP were derived. These strategies were put into six categories based on their individual meaning and relation to other factors; these include effective communication, legal and coordination, knowledge co-production, monitoring and evaluation, social initiatives, and consistent funding. Further, a conceptual framework was developed using a meta-governance approach, in which a four-step process is proposed to make the derived relationship management strategies actionable. The outputs of this study will be impactful for future empirical investigations on the use of PPP in building flood resilience.

Keywords: public–private partnership; flooding; community resilience; relationship; review

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1. Introduction

Sustainable development is fulfilling present needs without compromising the capability of future generations [1], but unfortunately, flooding negatively impacts sustainable development. Flooding leads to water pollution, unsanitary conditions, diseases, loss of life, loss of economic livelihood, and a chain of poverty [2]. It has implications for the sustainable development goals developed by the United Nations. The United Nations predicts that medium- to large-scale disasters will increase by 40% by 2030 [3]. Flooding is a common effect of climate change, and countries have experienced its devastating impact. Devastating floods can be seen as obstacles to sustainable development [4]. In addressing flood implications through preventative, preparedness, and adaptability measures, established collaborations with stakeholders are needed. Flood management emphasizes minimizing flood influences collaboratively with stakeholders who will consider the economy, society, and environment both from short-term and long-term perspectives within the community [5].

Community resilience is equipping people, communities, and infrastructure systems to bounce back more quickly from flood disaster impacts [6]. Preventing flood occurrences may not be assured; however, flood risk reduction and adaptation strategies can be implemented [7]. Public–private partnership is currently considered by many governments and researchers as an effective medium for managing community disaster and resilience [4]. Essentially, public–private partnership [8] is hailed as an effective approach for building

community flood resilience [8]. As stated in the Sendai Framework for Disaster Risk Reduction 2015–2030, reducing disaster risks and building resilience should not only be seen as the responsibility of the state government but rather as a collaboration between all stakeholders, including private sector organizations [9]. Further, [10] has emphasized that PPP is an important strategy for implementing risk disaster mitigation and risk financing. These assertions, therefore, emphasize the need for a PPP approach to building flood disaster resilience. A public–private partnership is a collaboration between public sector entities and private sector entities to achieve a specific goal or set of objectives [5]. The primary characteristic of PPPs is that added value can be achieved through greater cooperation between the public and private sectors [11]. Cooperation between public and private entities focuses on risk reduction instead of risk prevention [7], especially in instances where flooding may not be entirely prevented [4]. Public–private partnership gives financial capacity to local governments to improve capacity and provide training through improved coordination [12]. Collaboration between public entities and private entities will have a long-term influence on floods. This involves pre-flood activities, during-flood activities, and post-flood activities [13]. Although previous studies have explored PPPs in flood resilience, few, if any, have investigated PPP relationship management strategies in the context of flood disaster resilience. This study aims to bridge this research gap by exploring PPP relationship management strategies for building community flood disaster resilience through a systematic review. A systematic review is adopted because it is the most suitable methodological approach to gaining in-depth insights into a research domain [14]. This research focuses on studying community flood disaster resilience, where the community is defined as a set of physical and non-physical factors that make up the formation and transformation of cities [15].

2. Public–Private Partnership in Community Flood Management

Flooding causes loss of lives, property destruction, and loss of economic vibrancy in the community; therefore, the need for public sector organizations to collaborate with private entities is very critical to ensure the continuous functioning of economic systems before, during, and after flooding [16]. Private sector agencies or institutions may offer disaster relief assistance as part of their corporate social responsibilities. The private sector's involvement in planning and early response can help the community's long-term recovery from flood disasters [17]. The private sector may provide voluntary service that may be much lower than expected as opposed to a service level agreement with the public sector under a public–private partnership [16].

A public–private partnership is a common approach for most governments to engage private entities in infrastructure delivery [18]. In disaster management, it is recognized as a strategic approach between public institutions and private actors to curb disaster impacts [12]. Thus, it can be implied that public sector and private sector entities are stakeholders in community flood resilience. Freeman [19] refers to stakeholders as those who can affect or be affected by the achievement of a common goal. Stakeholders are grouped under either internal stakeholders (those that are entrusted to use resources to achieve an intended goal) or external stakeholders (those that are affected or perceived to be affected by the achievement of the goal) [20]. Within the context of this research study, internal stakeholders are the public and private sectors under the flagship of a "public-private partnership" to build community flood resilience", while external stakeholder management includes members of local communities who are perceived to be affected by the achievement of a PPP goal. The researchers saw it as necessary to apply stakeholder management principles to a public–private partnership formed to build community flood resilience. Relationship management is fundamental in stakeholder management [21], where a set of comprehensive strategies and processes are identified to create superior value for community flood resilience through developing sustainable relationships [22]. Stakeholder management manages relationships between organizations and their stakeholders [23]. Relationships impact the stakeholders of flood disasters, and managing stakeholders can

minimize their negative impacts to ensure goals are achieved [23]. Public entities and private entities collaboration brings potential benefits to flood resilience [24].

The private sector's involvement in disaster management is significant for flood resilience because their participation minimizes government weakness [12,25]. Private entities assist the government in developing better programs for disaster resilience [12,25]. It also drives innovation and the use of technology to expedite disaster recovery [17,26]. A public–private partnership involves multiple government agencies and institutions and private entities. It is a participatory process where an environment with exhaustive understanding can be developed [27]. Engaging flood stakeholders creates overlapping knowledge that strengthens the efforts dedicated to flood resilience, yielding more impactful outputs [28]. The multiple stakeholders in a PPP arrangement have different interests and concerns, which could be conflicting and mismanaged [29], thus having devastating consequences for flood resilience. Public and private stakeholders in partnerships are key to the success of building flood resilience in communities.

3. Research Methodology

Following the Systematic Literature Review method adopted by Osei-Kyei [30], Tijani et al. [31], and Osei-Kyei et al. [32], a literature review was conducted by searching for publications on relationship management strategies for public–private partnership in flooding. The Scopus database was used to search for relevant literature because it covers a wide range of academic journals from different disciplines [32]. Figure 1 outlines the workflow of the study.

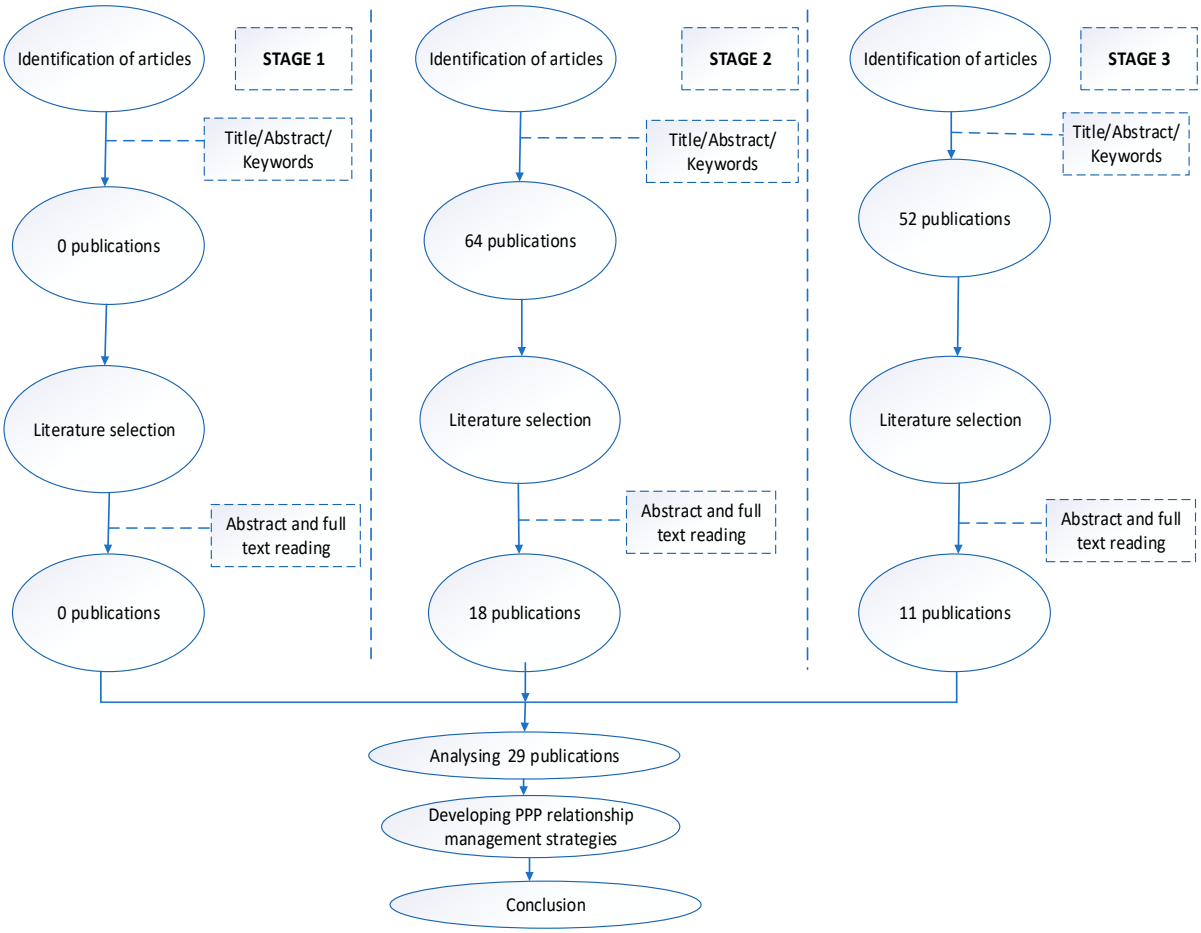

Figure 1. Research Process.

3.1. Literature Identification

A literature search was conducted in three stages. Multiple keywords related to relationship management strategies, community flood disaster resilience, stakeholder management, and public–private partnership was used to search for literature. There was no time limit for the search. The full search codes used are below. The total number of publications derived from the three literature stages was 116 publications.

The first stage of the literature search generated zero publications.

(TITLE-ABS-KEY ("PPP") OR TITLE-ABS-KEY ("public-private partnership") OR TITLE-ABS-KEY ("public private partnership") AND TITLE-ABS-KEY ("relationship management") AND TITLE-ABS-KEY ("flood resilience"))

In the second stage, keywords related to "public-private partnership", "relationship management" were used to search for literature. The keywords were combined in the Scopus database, which resulted in 64 publications. The search code used in the Scopus database is below.

(TITLE-ABS-KEY ("stakeholder management") OR TITLE-ABS-KEY ("stakeholder relationship") AND TITLE-ABS-KEY ("PPP") OR TITLE-ABS-KEY ("public-private partnership")

In the third stage, the search code used in Scopus generated 52 publications. The search code used is below.

(TITLE-ABS-KEY (stakeholder AND management) OR TITLE-ABS-KEY (relationship AND management) AND TITLE-ABS-KEY (flooding) OR TITLE-ABS-KEY (flooding AND resilience) AND TITLE-ABS-KEY (public-private AND partnership) OR TITLE-ABS-KEY (ppp) OR TITLE-ABS-KEY (partnership))

Considering the three stages, a total of 116 publications were derived. These publications were further analyzed to select the relevant publications.

3.2. Screening and Literature Selection

Abstract and full-text reading was conducted on 116 publicatio. Publications that align with relationship management for public–private partnerships were given preference and included in the publication selection for further analysis. Following the thorough reading of the 64 publications from the second stage, only 18 were found to have discussed or highlighted relationship management strategies that are peculiar to public–private partnership community flood resilience. Further, of the 52 papers from stage 3, 11 publications were found to have presented findings that align to public–private partnership relationship management strategies. Overall, a total of 29 publications were considered relevant for further analysis. The list of selected papers is presented in Table 1.

Table 1. List of selected papers.

S/N	Authors	Title	Year	Journal
1	Ghanem M., Elshaer I., Saad S.	Tourism public-private partnership (PPP) projects: an exploratory-sequential approach	2022	Tourism Review
2	Surachman E.N., Perwitasari S.W., Suhendra M.	Stakeholder management mapping to improve public-private partnership success in emerging country water projects: Indonesia's experience	2022	Utilities Policy
3	Sanda Y.N., Anigbogu N.A., Izam Y.D., Nuhu L.Y.	Managing Stakeholder Opportunism in Public-Private Partnership (PPP) Housing Projects	2022	Journal of Construction in Developing Countries
4	Kaharuddin S.K., Adnan H., Baharuddin H.E.A.	Identification of Successful Delivery Factors for Stakeholder Management in Public-Private Partnerships Projects in Malaysia	2021	International Journal of Sustainable Construction Engineering and Technology

Table 1. *Cont.*

S/N	Authors	Title	Year	Journal
5	Dithebe K., Aigbavboa C.O., Thwala W.D.D., Hayhow S., Talebi S.	Stakeholder management in the alleviation of legal and regulatory disputes in public-private partnership projects in South Africa	2021	Journal of Engineering, Design and Technology
6	Jayasuriya S., Zhang G., Yang R.J.	Exploring the impact of stakeholder management strategies on managing issues in PPP projects	2020	International Journal of Construction Management
7	Maraña P., Labaka L., Sarriegi J.M.	We need them all: development of a public private people partnership to support a city resilience building process	2020	Technological Forecasting and Social Change
8	Amadi C., Carrillo P., Tuuli M.	PPP projects: improvements in stakeholder management	2020	Engineering, Construction and Architectural Management
9	Kaharuddin S.K., Adnan H., Bahaniddiir H.E.A.	Assessing the emerging factors on stakeholder management in public-private partnerships (ppp) in Malaysia	2019	International Conference on Construction in the 21st Century
10	Marana P., Labaka L., Sarriegi J.M.	A framework for public-private-people partnerships in the city resilience-building process	2018	Safety Science
11	Amadi C., Carrillo P., Tuuli M.	Stakeholder management in PPP projects: external stakeholders' perspective	2018	Built Environment Project and Asset Management
12	Osei-Kyei R., Chan A.P.C., Ameyaw E.E.	A fuzzy synthetic evaluation analysis of operational management critical success factors for public-private partnership infrastructure projects	2017	Benchmarking
13	De Schepper S., Dooms M., Haezendonck E.	Stakeholder dynamics and responsibilities in Public-Private Partnerships: A mixed experience	2014	International Journal of Project Management
14	Henjewele C., Fewings P., Pantaleo D.R.	De-marginalising the public in PPP projects through multi-stakeholders management	2013	Journal of Financial Management of Property and Construction
15	Kabahinda E., Mwesigwa R.	Trust Mediates the Relationship Between Stakeholder Behavior and Stakeholder Management of Public Private Partnership Projects in Uganda	2022	Public Organization Review
16	Osei-Kyei R., Chan A.P.C.	Public sector's perspective on implementing public—private partnership (PPP) policy in Ghana and Hong Kong	2018	Journal of Facilities Management
17	Burke R., Demirag I.	Risk transfer and stakeholder relationships in Public Private Partnerships	2017	Accounting Forum
18	Osei-Kyei R., Chan A.P.C., Ameyaw E.E.	A fuzzy synthetic evaluation analysis of operational management critical success factors for public-private partnership infrastructure projects	2017	Benchmarking
19	Mehring P., Geoghegan H., Cloke H.L., Clark J.M.	What is going wrong with community engagement? How flood communities and flood authorities construct engagement and partnership working	2018	Environmental Science and Policy

Table 1. *Cont.*

S/N	Authors	Title	Year	Journal
20	Thaler T., Levin-Keitel M.	Multi-level stakeholder engagement in flood risk management-A question of roles and power: Lessons from England	2016	Environmental Science and Policy
21	Geaves L.H., Penning-Rowsell E.C.	Flood Risk Management as a public or a private good, and the implications for stakeholder engagement	2016	Environmental Science and Policy
22	Rauter M., Kaufmann M., Thaler T., Fuchs S.	Flood risk management in Austria: Analysing the shift in responsibility-sharing between public and private actors from a public stakeholder's perspective	2020	Land Use Policy
23	Aguilar-Barajas I., Sisto N.P., Ramirez A.I., Magaña-Rueda V.	Building urban resilience and knowledge co-production in the face of weather hazards: flash floods in the Monterrey Metropolitan Area (Mexico)	2019	Environmental Science and Policy
24	Lamond J., Adekola O., Adelekan I., Eze B., Ujoh F.	Information for adaptation and response to flooding, multi-stakeholder perspectives in Nigeria	2019	Climate
25	Meyer M.A., Hendricks M., Newman G.D., Masterson J.H., Cooper J.T., Sansom G., Gharaibeh N., Horney J., Berke P., van Zandt S., Cousins T.	Participatory action research: tools for disaster resilience education	2018	International Journal of Disaster Resilience in the Built Environment
26	O'Donnell E.C., Lamond J.E., Thorne C.R.	Learning and Action Alliance framework to facilitate stakeholder collaboration and social learning in urban flood risk management	2018	Environmental Science and Policy
27	González-Riancho P., Gerkensmeier B., Ratter B.M.W., González M., Medina R.	Storm surge risk perception and resilience: A pilot study in the German North Sea coast	2015	Ocean and Coastal Management
28	Reyers B., Nel J.L., O'Farrell P.J., Sitas N., Nel D.C.	Navigating complexity through knowledge coproduction: Mainstreaming ecosystem services into disaster risk reduction	2015	Proceedings of the National Academy of Sciences of the United States of America
29	Baba H., Watanabe T., Miyata K., Matsumoto H.	Area business continuity management, a new approach to sustainable local economy	2015	Journal of Disaster Research

The low number of publications clearly demonstrates that many researchers have not attempted to explore the relationship management of the public and private sectors in building community flood resilience. This, therefore, calls for the need for more research in this important area. It should also be mentioned that the 29 selected papers are considered adequate for further analysis when compared with other systematic review papers in the built environment (for example, Osei-Kyei et al [32], analyzed 35 papers, and Tijani et al. [31], analyzed 32 papers). Lastly, this review paper aims to explore and develop a checklist of the critical relationship management strategies for building community flood resilience through PPP; therefore, the selected 29 papers are adequate for further analysis.

3.3. Analyzing the Selected Papers

The selected 29 publications were subjected to content analysis techniques to derive relationship management strategies for building flood resilience through PPP. The content analysis was performed manually because the number of publications considered for this

study was small. First, relevant words and statements were retrieved from the examination of the papers. Subsequently, the extracted items were coded, and similar coding patterns were grouped into relevant themes [33]). The themes were then subjected to qualitative interpretation to derive the relevant strategies [33].

4. Results and Discussion

4.1. Time Distribution of Selected Publications

The annual publication trend reflects the number of articles published on a yearly basis. Figure 2 shows the time distribution of the sampled publication. It must be noted that the sampled publications from Scopus were selected because they had content that was useful and related to PPP relationship management strategies. Indicating the time distribution of the sampled publications can enhance the reliability and confidence of the results used to achieve the aim of this study. As stated earlier, there are few studies that have explicitly explored relationship management strategies in public–private partnerships. As a result, the derived relationship management strategies for public–private partnerships in flood resilience in this study were inspired by the 29 sampled publications.

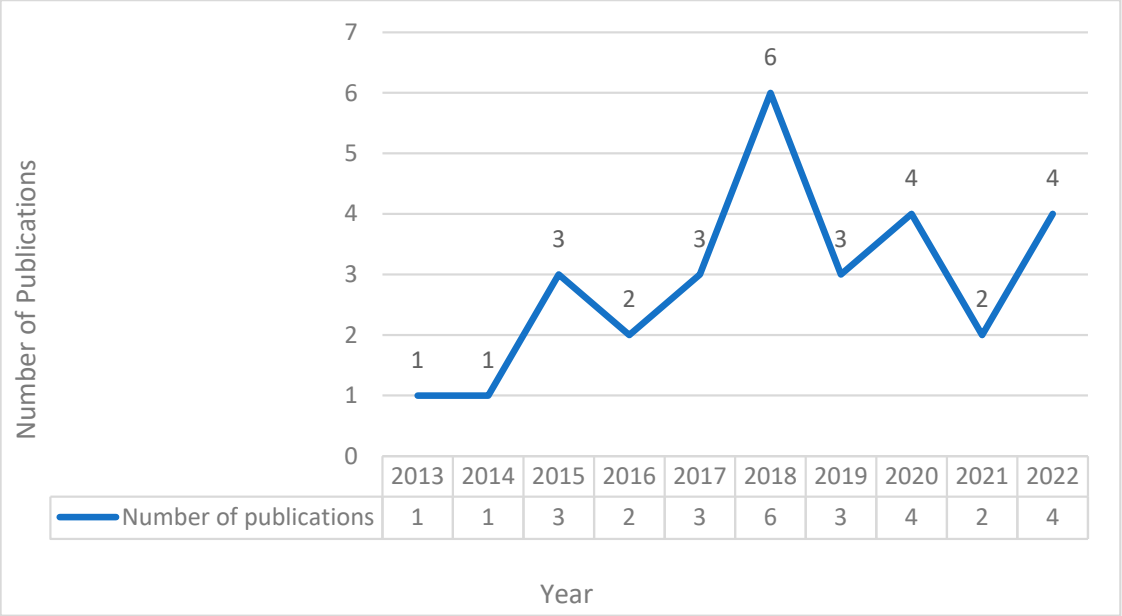

Figure 2. Time Distribution of Sampled Publications.

From the sampled publications that inspired the derived PPP relationship management strategies in community flood resilience, six publications were from 2018. In fact, since 2018, there has been a steady increase in publications related to PPP in flood resilience management, and this shows the increasing attention to PPP in flood management. However, this increase can be accelerated if more research funding is channeled into flood disaster management using the PPP concept.

It could also be realized from Figure 2 that few publications have focused on PPP in flood management between 2013 and 2017; this is not surprising because the PPP concept has been seen as a procurement and financing option for infrastructure project delivery during the last two decades. Essentially, the concept of applying PPP in flood disaster management only came to light in recent times following the introduction of the Sendai Framework for Disaster Risks Reduction 2015–2030 in 2015.

Notwithstanding, considering the need for strong collaborations between public and private organizations to build disaster resilience, more research publications will emerge in the next couple of years on the application of PPP in flood management [34].

4.2. Geographic Analysis of the Selected Papers

The volume of research publications on a specific research area may be proportioned to the extent of policy and industry practices of the specific research area [30]. It reflects the current issues that countries need to address or have invested resources in that research area. In this study, the case studies countries, which are the countries used as research studies, were analyzed as opposed to the author's country of affiliation. Using a content analysis approach, this study identified the geographical study areas used as case studies in the selected articles to determine their contributions to relationship management strategies. The case study countries were grouped into five geographic regions: Europe, North and South America, Asia, and Australia. The geographic representation is shown in Figure 3.

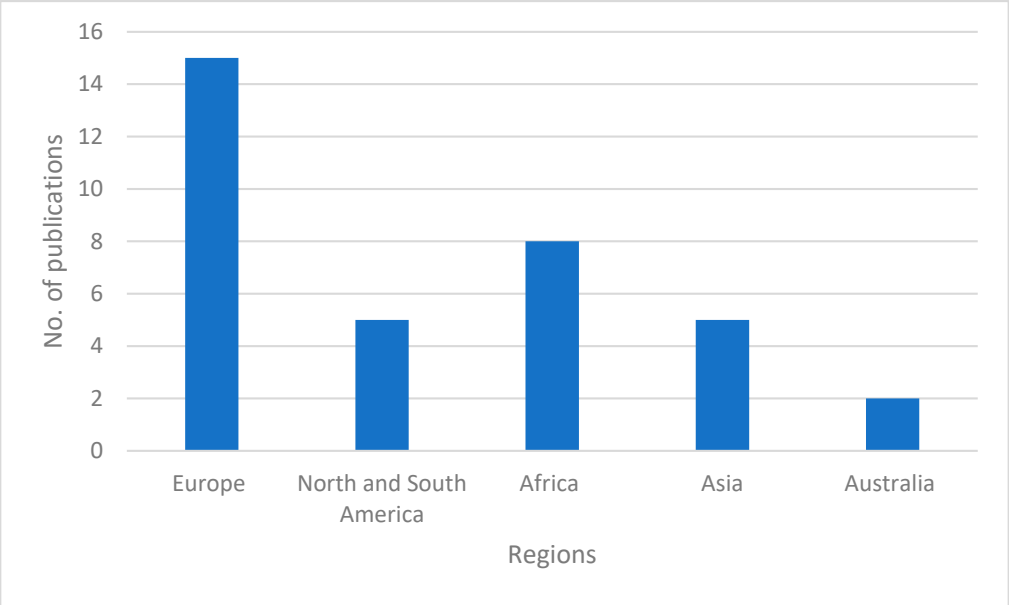

Figure 3. Geographic analysis of selected papers.

Europe recorded 15 publications, and these publications were from countries such as the United Kingdom, Norway, Italy, Spain, Denmark, and Belgium. North and South America recorded five publications, and these publications were from countries such as Canadian, Mexico, the United States, and Germany.

Africa recorded eight publications from Egypt, Nigeria, South Africa, and Ghana. PPPs have been proven to enhance resilience building in Africa in recent times. Many community resilience programs, including flooding management, have been performed through the PPP concept, and this has helped improve the livelihood of many communities [32]. Asia recorded five publications from Indonesia, Malaysia, and Hong Kong. Australia recorded two publications. In Asia, the use of PPPs is continuing with varying degrees of implementation and success [35]; however, more efforts should be made towards using the PPP concept for community flood resilience building.

4.3. Relationship Management Strategies for Building Flood Resilience through PPP

A public–private partnership is an instrument to build influence among stakeholders. PPPs rely on crafted agreements defining the rights and obligations of the parties involved and establishing a framework for responding to new situations as they arise [36]. The list of relationship management strategies for using public–private partnerships to build community flood resilience is shown in Table 2. It should be mentioned that the list of strategies in Table 2 was derived following a content analysis based on the themes of the findings of the selected papers. Further, based on the individual meanings and relationships of the derived strategies, they were further categorized into six groups. Essentially, the naming of the categories is subjective; therefore, different researchers may provide different

names for the six groups. Notwithstanding, the names provided for the six groups in this study reflect the interrelations and meanings of the individual factors in each group. Therefore, the name for each of the groups is considered suitable for future reference.

Table 2. List of relationship management strategies.

Categories	Strategies	Reference Numbers from Table 1
Effective Communication	Facilitating information exchange (Knowledge transfer and experience)	1, 4, 7, 21, 23, 26, 29
	Frequency of meetings and communication during design and implementation	1, 14
	Identifying all stakeholders of the PPP	1
	Effective communication	2, 4–6, 8, 9, 22, 25
	Considering the needs of stakeholders in the early stages of planning	1, 24
	awareness of resilience flood resilience action plan	4
Legal and Coordination	Strong legal and institutional framework to ensure parties adhere to contract agreement	3–5
	Providing clarity on roles of each stakeholder	5, 6, 27
	Updating/managing concerns and conflict	14
	Provision of speedy dispute resolution mechanism	3–5, 11, 12, 14
	Creation of governance structures that enable the allocation of responsibilities and accountabilities	13
Knowledge co-production	training for members of partnership working in community consultation and for staff who manage the operational period	4, 6, 8, 13
	employment of highly skilled and competent workmanship in service operations	12, 19
	Availability of training programs	1, 7, 21
	Managerial and technical knowledge and skills of partners	1
	Professional human resources and management	25
	knowledge coproduction	28
	participatory infrastructure assessment	25
Monitoring and Evaluation	Monitoring relationships and performance	1–3, 5, 7, 10
	Participatory infrastructure assessment	25
Social initiatives	transparency among stakeholders	11
	Understanding stakeholders' interest areas (needs and constraints)	5
	Trust in partner's representatives	1, 3, 5, 7, 9, 10
	Respect between partners	1
	Strong project commitment and initiative	2
	Providing effective leadership	5
	cooperation agreements with surrounding municipalities and public utility companies	13
Consistent Funding	Regular funding	9, 20

4.3.1. Effective Communication

The relationship among stakeholders in a partnership implies an active and dynamic exchange of information and implementation strategies for flood resilience practices [37]. Relationship management under this category includes facilitating information exchange, frequency of meetings and communication during design and implementation, identifying all stakeholders of the PPP, effective communication, and considering the needs of stakeholders in the early stages of planning. One of the major barriers to flood resilience is the lack of integrated communications between and among government agencies and industry partners [38]. Effective communication requires directed planning, monitoring, and controlling all communication channels within an organization [39]. Information quality facilitates communication between different partners, which enables the partnership to identify the requirements and resources needed to implement flood resilience strategies [40]. Better decision-making requires higher-quality information, and it is an effective approach to flood resilience measures [24]. Effective communication management is a process of effective information exchange that ensures that parties in a public–private partnership receive needed information on time [39]. It provides each stakeholder with all the information needed to believe that their expectations are known and delivered [41]. Stakeholder engagement has the possibility of securing a wide range of benefits for the goal of partnership [42]. Clear communication protocols with timely notification of new or updated information are valuable to assist all partners in having updated and similar information [43]. Flood resilience requires multifaceted knowledge collaboratively constructed by stakeholders [44]. Shared knowledge and understanding would facilitate and sustain the social connection between public and private partners [45].

4.3.2. Legal and Coordination

The components of this category are a strong legal and institutional framework to ensure parties adhere to the contract agreement, providing clarity on the roles of each stakeholder, updating/managing concerns and conflict, provision of a speedy dispute resolution mechanism, and creation of governance structures that enable the allocation of responsibilities and accountabilities. Partnerships involving the public and private sectors are a way of sharing responsibilities to significantly improve flood resilience in urban communities [46]. Coordination refers to the need to define the boundaries of each partner's responsibilities and specify the tasks each partner is expected to perform [24]. Coordinating activities across public and private entities increases coordination among partners [47]. Private and public authorities must have specific tasks and responsibilities within flood risk management [48]. Each stakeholder in a PPP arrangement may perceive their tasks and contributions differently. As a result, their actions have to be coordinated to prevent duplication of resources and their service contribution [49]. Conflict resolution among partners must take a constructive approach for parties to have a sense that their interests are taken seriously [50]. Independent and trusted agencies may prepare guidance documents aimed at a range of stakeholders to help address any misunderstandings or challenges [51].

4.3.3. Knowledge Co-Production

Stakeholders in PPP must be trained frequently to react and control flood disruption to ensure continuity of infrastructure performance [52]. Relationship strategies under this category are training, employment of highly skilled and competent workmanship in service operations, availability of training programs, managerial and technical knowledge and skills of partners, professional human resources and management, knowledge co-production, and participatory infrastructure assessment. Resilience policies will be effective in their implementation when knowledge is collaboratively constructed by stakeholders [44]. Different stakeholders require different knowledge details depending on their assigned task in flood resilience [49]. Participatory infrastructure assessment of potential flood risk in communities demonstrates stakeholders' interest in flood resilience [53]. The

O'Donnell, Lamond [54] learning alliance and action framework encourages stakeholders to convey their knowledge and expertise to facilitate social learning where the vision of the partnership is negotiated to address flood disasters. The reason for public agencies and private agencies to form partnerships may be the advantages accrued from collaboration in building community flood resilience. The advantages in terms of learning technology will enable partners to see observable results in their resilience strategies. Collaboration is a source of innovation [37]. In relationship management among stakeholders, innovations for flood resilience are identified and discussed thoroughly to implement the most efficient solutions.

4.3.4. Monitoring and Evaluation

Evaluation is making judgments based on the information provided by monitoring [55]. Engagement activities among PPP participants and flood resilience strategies must be documented and reported back to the stakeholders of the PPP and external bodies [42]. The significance of monitoring and evaluating flood resilience strategies is an indicator for finding out how beneficial a public–private partnership is for flood resilience [56]. A public–private partnership consists of a variety of stakeholders where new stakeholders participate when other stakeholders drop out [57]. It is, therefore, important to monitor and analyze the changes in stakeholder impact and interactions during stakeholder monitoring [58]. Flooding disasters are recurring events with high variability in their damage and impacts on society. As a result, new technologies and techniques must be developed to enable society and its infrastructure to recover quickly from the negative impacts of flooding. Flood resistance technologies keep water out of buildings, while resilient flood measures may allow ingress but create conditions for quicker recovery of individuals, communities, and buildings [51]. Successful relationships, i.e., relationships that lead to the successful implementation of flood resilience policies, should be monitored, and maintained or investigated to improve their relationship [58].

4.3.5. Social Initiatives

The relationship management strategies under this category are transparency among stakeholders, understanding stakeholders' interest areas (needs and constraints), trust in partners' representatives, respect between partners, strong project commitment and initiative, providing effective leadership, and cooperation agreements with surrounding municipalities and public utility companies. Different stakeholders come with different levels of trust and willingness to trust. Trust is fundamental to creating a meaningful engagement process [42]. Managers need to gauge the level of trust in relationships but not be too quick to judge [42]. Commitment refers to the willingness of partners to exert effort on behalf of the partnership and eliminate self-interests [24]. Floods may be an inevitable disaster that requires committed partners to have the capacity to focus on long-term goals [24]. Trust is a vital component in a partnership where partners collaborate to achieve a goal. Trust reduces the uncertainty of the actions of parties in partnership because parties already know what they can expect from each other [59]. Trust leads to quick mutual commitment, which results in greater cooperation [60].

4.3.6. Consistent Funding

Cross-sector collaboration must be conducted by officials with authority and financial resources to implement flood resilience [38]. Financial support is necessary to form and maintain partnerships [61]. Regular funding for the activities of a PPP ensures the success of their relationship [23]. Financial responsibilities for each party in the partnership must be outlined and communicated devoid of ambiguity. This will reduce any misunderstandings and conflicts.

5. Conceptual Model

A public–private partnership requires a stakeholder management approach where the relationship among stakeholders leads to homogenous cooperation with contributions to fulfill community flood resilience [62]. The partnership formed between the public and private stakeholders forms a relationship network where rules are fixed for common action, i.e., community flood resilience, and determine the responsibilities of individual stakeholders. A public–private partnership involves governance functions where rules and procedures define the relationship between the stakeholders that participate in a PPP [63].

This study uses the meta-governance approach to develop a relationship management conceptual framework for a public–private partnership network of stakeholders instituted to build urban community resilience, as depicted in Figure 4. Meta-governance offers indirect control to the government, where the government becomes the coordinator and simulator of the PPP network [62]. A public–private partnership network must have representation from all relevant stakeholders to reduce the likelihood of the process being jeopardized by narrow interests [64].

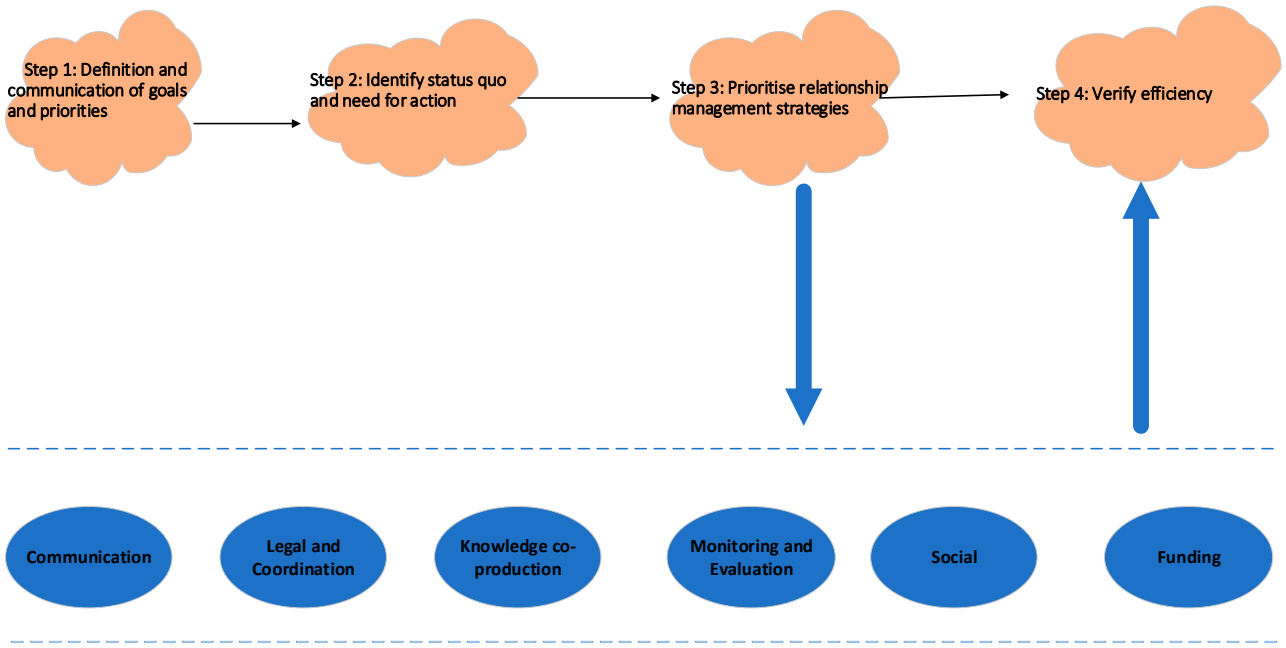

Figure 4. Conceptual Model.

To render the identified relationship management strategies actionable, a four-step approach proposed by Dunn-Cavelty and Suter [62] is adapted and explained below. Generally, the conceptual model consists of four major steps, and the application of the identified relationship management strategies is realized in Step 3. Details of each step are provided below.

However, it should be mentioned that the model presented in this study is generic and can be adopted in all jurisdictions and modified to suit each country's context. Certainly, some of the identified relationship management strategies in this model will vary in terms of their significance in different countries contexts.

Step 1: Definition and communication of goals and priorities

The main idea of meta-governance is for the government to coordinate the activities of a public–private partnership network that aligns with the goal of forming the partnership. The government's coordination is premised on communicating the goal of the collaboration to the stakeholders of the PPP. The government must give legitimacy to the PPP network. Legitimacy gives validity and authority to the PPP network and its responsibilities [65]. Stakeholders in the PPP network must be aware of their responsibilities and

the resources required to accomplish those responsibilities. The more clearly defined and well-communicated tasks and expectations are, the easier their implementation will be.

Step 2: Identify the status quo and need for action

The second step in meta-governance is to analyze the status quo and to identify where action is required. The 'status quo' means the current situation. In this instance, questions such as 'has the community been impacted by flooding event before?', 'what were the recovery actions implemented in the community to restore the communities economic and social activities?', 'was the community satisfied with the aftermath of restoration activities?', and 'what is the community currently lacking in their flood resilience strategies'? These questions can lead to answers to determine the community's flood resilience status quo. As part of the status quo analysis, (1) what is to be achieved and (2) how the PPP network desires to undertake its flood resilience responsibilities are indispensable parts of the analysis.

Step 3: Prioritize relationship management strategies

When the flood resilience action has been identified, the third step is to identify and prioritize the identified relationship management strategies. Meta-governance is a self-regulation approach where a network of public–private partners create a framework of conditions that allow the network to organize itself with minimal direct control from the central government. The PPP network must be allowed to explore and experiment with relationship management strategies with minimal control from the government. The role of the central government is to coordinate and stimulate the networks by ensuring that the "self-regulating networks" perform their tasks.

Step 4: Verify efficiency

In the fourth step, the efficiency of the relationship management strategies is analyzed. A government authority checks whether, in applying relationship management strategies, the PPP networks now meet their task in such a way that flood resilience is achieved in communities [62]. Evaluation of the activities of PPP networks must be conducted with the understanding that some flood resilience might not be achieved within short time periods. As a result, the evaluation process must be flexible enough to allow additional improvements to the status quo of flood resilience in communities. Monitoring and evaluation are mandated to evaluate progress and non-compliance with rules or agreements [65].

6. Implications for Future Practice and Research

Flooding disasters are a recurrent event in most countries. In worst-case scenarios, the occurrence of floods may not be entirely preventable; however, they can be managed efficiently to reduce their devastating consequences. Public-private partnership as a multi-level stakeholder engagement is recognized as an effective approach to flood resilience. Considering that public–private partnerships are usually used to secure infrastructure projects, their relationship management will differ from a public–private partnership set up to build community flood resilience. The findings of this research will contribute significantly to future research and practice.

First, the conceptual model provides a knowledge base on which further empirical studies can be conducted. Specifically, it is recommended that the conceptual model, which includes the identified relationship management strategies, should be adopted and used on a case-by-case approach to test out its applicability within a geographic context.

Second, government agencies and private sector organizations will be adequately informed of the salient relationship management strategies that should be considered to successfully build flood disaster resilience through the PPP concept. The broad categories of strategies will provide practitioners with information on the general areas of relationship management in PPP in flood disaster management to achieve successful performance.

7. Conclusions

Public–private partnership involvement in flood resilience usually influences pre-flood activities, during-flood activities, and post-flood activities. In the search for literature, it was identified that few studies, if any, have explored relationship management strategies for a public–private partnership set up to build community flood resilience. Considering how devastating a recurrent disaster such as flooding usually is and how significantly a public-private partnership enhances flood resilience, it became necessary to conduct this study. As a result, this study sought to explore different relationship management strategies for using the public–private partnership concept to build community flood resilience. An initial list of 116 publications was selected through a systematic process using the Scopus database. Twenty-nine publications that align with public–private partnership relationship management studies were finalized. Through a thorough analysis of the selected publications, a list of 28 relationship management strategies was identified and discussed in relation to community flood resilience. Drawing on the individual meanings and relationships of each strategy with other factors, the 28 strategies were grouped into six broad categories, which include communication, legal and coordination, knowledge co-production, monitoring and evaluation, social, and funding. Further, a conceptual model was developed using a four-step approach for meta-governance. A meta-governance approach was adopted in this study because the public–private partnership has elements of governance functions where rules and procedures guide the relationship between the stakeholders that participate in a PPP. The outputs of this research will be impactful for future empirical investigations on the use of PPP in building flood resilience.

The major limitation of this study is the limited number of papers selected for the review analysis, and this is understandable because the PPP concept is relatively new in flood disaster management. In this regard, few studies have attempted to explore issues in this emerging area. Nevertheless, the outputs of this study are still useful for future research and practice.

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