

Vertical-horizontal actor collaboration in governance network: A systematic review

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Author contributions

All authors contributed to the study conception and design. The idea for the article by all authors, performed the literature search and data analysis, and drafted the work by Oke Hendra. Critically revised the work by Reza Fathurrahman, Eko Prasajo and Colin Pilbeam. The first draft of the manuscript was written by Oke Hendra, and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Compliance with Ethical Standards

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The authors declare no conflict of interest.
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Abstract

This research proposes a categorization framework to analyse multi-actor collaboration variations in governance network. It examines both vertical (government levels) and horizontal (sectors) interactions. This study reviewed 92 academic articles, adhering to the PRISMA methodology and utilizes 2x2 and "who-how-what" frameworks to capture the breadth of vertical-horizontal collaboration arrangements. The study identifies a rise in multi-actor collaborations and a dominance of qualitative research. It exposes research gaps: limited cross-sectoral and international actor studies, and under-researched sectors beyond environment. The proposed framework, capturing actors, levers, purposes, and context, aims to guide future research on vertical-horizontal actor collaboration in governance network.

Keywords: governance network; PRISMA methodology; systematic review; vertical-horizontal actor collaboration

INTRODUCTION

The latter half of the 20th century (1970s-80s) witnessed a governance paradigm shift driven by neoliberalism and globalization (Farazmand, 1999). This reshaped state-society relations, sparking anxieties about a diminished public sphere and powerful private actors, which in turn fuelled calls for enhanced accountability (Papadopoulos, 2022). However, potential benefits, including increased citizen engagement, flexible policymaking, and a more integrated mode of governing emerged (Bovaird & Loeffler, 2022; Edelenbos & Van Meerkerk, 2022). The state adapted to this network reality, forming a more pluri-centric model that complements its reach through collaboration with diverse actors (Isailovic & Pattberg, 2022; Jessop, 2022). This collaboration, emphasized in governance networks, have become a key area of study in public administration (Koliba et al., 2019; Morçöl et al., 2021). Governance networks highlight the importance of collaborative efforts across geographic levels, facilitated by both vertical and horizontal administrative structures. This reflects the reality of many governments, functioning along a spectrum between purely vertical and purely horizontal, necessitating hybrid strategies that combine traditional hierarchies with collaborative decision-making (Koffijberg et al., 2012).

The vertical dimension signifies collaboration between public sector levels (local, national, supranational), while the horizontal dimension involves collaboration between public sector (government) and other sectors, including private sector (businesses) and third sector (non-profits, non-government organizations). Vertical-horizontal collaboration can manifest across multiple levels and sectors, or within a single level or sector. This study categorizes multi-actor collaborations within governance network. Drawing on existing literature, it analyse these collaborations based on a 2x2 conceptual matrix (**figure 1**) and "who-how-what" framework develop by Hillman et al. (2011), examining actors involved (who), collaboration levers (how), and collaboration context and purpose (what). This categorization aims to illuminate variations in collaboration across levels and sectors, guiding future research in governance network. Following a brief overview of cross-dimensional collaboration, the paper will detail methodology, results, discussion, and conclude with future research suggestions.

Collaboration

Despite frequent interchangeable use, collaboration, cooperation, and coordination represent distinct concepts in understanding inter-organizational interactions (Stout & Keast, 2021). Key distinctions lie in the intensity of interaction and power dynamics (Castañer & Oliveira, 2020; Gray, 1994). Cooperation, the least intensive, involves independent actors prioritizing self-interests and merited-base engagement. Coordination, involving a higher level of interaction with group-oriented goals and positional engagement. Collaboration, the most intensive is more relational assuming interconnectedness, interdependence both individual and group interests and transparent, inclusive, and participative. Power dynamics further differentiate these concepts. Cooperation prioritizes individual goals and self-interest, characterized as "power-to" approach, where power is used to achieve personal objectives. Coordination emphasizes rule-enforcement due to mistrust, reflecting a "power-over" approach, where power is used to control and ensure

compliance. Collaboration fosters shared goals, interdependence, and transparency, representing "power-with," where power is used collaboratively to achieve mutually beneficial outcomes.

	Multi-sector (MS)	Single sector (SS)
Multi-level (ML)	1 st arrangement ML-MS	2 nd arrangement ML-SS
Single level (SL)	3 rd arrangement SL-MS	4 th arrangement SL-SS

Fig1.conceptual matrix for vertical-horizontal actor collaboration arrangements (Source(s): own creation)

Vertical-horizontal actor collaboration arrangements – conceptual matrix

This study introduces a 2x2 matrix to categorize multi-actor collaborations within governance network. The vertical dimension positions public sector actors below the nation-state at the core of the network, categorized as multi-level (ML) or single level (SL). ML collaborations encompass supranational, national, and local actors (including regional or provincial levels, considered local due to similar conditions under national governance). This enables interactions such as supranational-national-local (SNL), supranational-national (SN), supranational-local (SL), and national-local (NL). SL collaborations occur exclusively at supranational (S), national (N), or local (L) level. The horizontal dimension captures non-state actor involvement at the same analytical level below the nation-state, categorized as multi-sector (MS) involving private (P) and third (T) sectors, or single-sector (SS) involving government entities working solely with private or third sector partners.

Vertical-horizontal actor collaboration arrangements in “who-how-what” framework.

This review leverages "who-how-what" framework to categorize collaboration arrangements within governance network (**Table 1**). Building on the conceptual matrix, the framework dissects collaboration across three dimensions. "Actors" (Who) captures the levels and sectors involved, aligning with the conceptual matrix. "Levers" (How) identifies five key levers for fostering collaboration drawing from established research (Berardo et al., 2014; Calanni et al., 2015; Fischer et al., 2017; Fischer & Sciarini, 2016). These levers include: 1. Trust Building (T): Collaborative engagement that fosters trust among network members. 2. Power and Authority (PA): Recognition that actors with authority positions can shape collaboration. 3. Rules and Guiding Principles (RGP): Overarching legal mandates that establish a framework for collaboration. 4. Boundary Spanners (BS): Actors who play a role in bridging information gaps within the network. 5. Projects (P): Project-based collaboration or joint initiatives that facilitate collaboration among network members.

Finally, the framework incorporates "Context and Purpose" (What) of collaboration. Context refers to the specific issue, such as environmental concerns (Osman et al., 2015) or a policy area (Berdej & Armitage, 2016; Laffin et al., 2014). Purpose can range from deconstructing complex issues to facilitating policy implementation. Notably, context and purpose are further categorized into five broad groups each for more focused analysis. Context categories include environment issues, health policy, urban policy, other policy areas, and other contexts. Purposes map onto the policy cycle, a sequential series of stages, encompass agenda setting (identification of government attention-worthy problems), formulation (development of policy options), decision-making (policy adoption or rejection), implementation (putting policy into effect), and evaluation (monitoring policy outcomes by stakeholders) (Howlett & Ramesh, 2003; Xun Wu et al., 2018).

Table 1. Key dimensions of "who-how-what" framework; (Source(s): Own creation)

Who	How	What	
Actor involved	Lever of collaboration	Context	Purpose
Based on levels of public sector (Pu):	Trust Building (T).	1. Environmental issues.	1. Agenda setting (complexity, crises)
Supranational (S)	Power and	2. Health policy.	2. Formulation (policy
National (N)	Authority (PA).	3. Urban policy.	objective, policy making,
Local (L).	Rules and Guiding	4. Other policies areas	environment governance,
Based on sectors:	Principles (RGP).	(education, housing,	strategic partnership)
Public sector (Pu)	Boundary Spanners	transportation, etc.).	3. Decision making
	(BS).		

Private sector (Pr) Third sector (Th)	Projects (P).	5. Others (multi, undefined, international development, NDG, water management)	4. Implementation (policy implementation, service delivery) 5. Evaluation (innovation)
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REVIEW METHODOLOGY

This review aims to identify research gaps, limitations, and offering practical insights for practitioners. Therefore, the guiding research question is:

RQ: *How are multi-actor collaborations governed across different levels (vertical) and sectors (horizontal) in the context of governance network?*

To ensure transparency and adherence to review standards, this study employs a combined approach of descriptive and thematic analyses. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Page et al., 2021) guides this four-stage process (**Figure 2**) for identification, screening, eligibility assessment, and article inclusion.

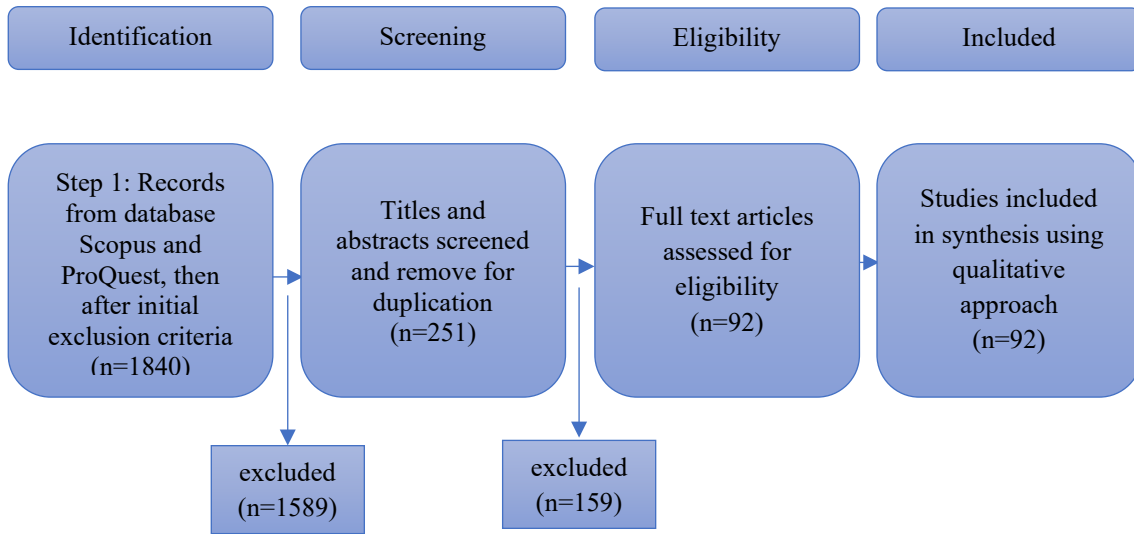


Fig2.literature selection flow diagram with PRISMA (Source(s): Own creation)

Study selection

Table 2. Search strings for collecting the data per database; (Source(s): Own creation).

Databases	Search string
Scopus	((governance OR government OR administration OR authority) AND (networ* OR collaborative OR polycentr*)) AND ((hierarch* OR vertical) AND (networks OR horizontal) OR (hybrid OR multi-mode) AND (practices OR arrangement OR structures OR modes OR govern*)) OR ((multi-actor OR institutions OR nodes) AND (collaboration OR coordination OR cooperation)) AND (public AND (administration OR service OR sector))
ProQuest	((multi-actor OR multi-stakeholder) collaboration) AND (hybrid governance OR "hierarch* and network") AND (governance AND network OR networks)) AND (public sector OR public administration)

A systematic search strategy utilized Scopus and ProQuest, with tailored Boolean operators for each database (details in **Table 2**). This maximized platform-specific functionalities, yielding 1,840 initial articles. Titles and abstracts were manually screened for eligibility. A two-pronged approach was adopted: initial relevance sorting in Scopus followed by pre-defined inclusion criteria (**Table 3**). ProQuest screening employed tailored exclusion criteria to address potential database variations. This resulted in 251 articles for full-text review (1,589 excluded). A comprehensive full-text review guided by the established protocol identified 92 articles for qualitative synthesis (159 excluded). The literature selection concluded in December 2023.

Table 3. Inclusion-exclusion criteria; (Source(s): Own creation)

Selection stages	Inclusion criteria	Exclusion criteria
Databases features:		
• Publication type	Research and review articles	Proceedings, book chapters, book, book reviews, editor notes, thesis, dissertation, magazine, and other grey literature
• Publishing language	English	Non-English
• Review process	Peer-review	Non-peer review
• Source access	Full access	Only abstract access
• Publication stage (Scopus)	Final stage	In press
Read Title and abstract manually	For Scopus database, articles with titles and abstracts explicitly mentioning governance, networks, multi-actors/stakeholders/organizations, or hybrid structures (involving interplay between hierarchy and networks)	ProQuest excluded articles on non-public governance networks (private, NGO, IO, community), purely intergovernmental collaborations, and contractual Public-Private Partnerships (market governance). Duplicates from Scopus were also removed.
Full text reading	The research examines governance networks across public, private, non-profit, and international sectors, considering both multi-level and sectoral dimensions. It focuses on the conceptual framework and effectiveness of these networks, particularly their roles in facilitating multi-actor collaboration and hybrid governance, both independently and in combination.	The research investigates governance networks in three spheres: private sector, non-profits, and international development (excluding public sector). Alternatively, it examines public sector networks excluding non-governmental actors. A third focus analyses Public-Private Partnerships (PPPs) through a market governance lens. Moreover, the research delves beyond multi-actor collaboration and hybrid governance models. Studies solely focused on these, without a dedicated network concept, utilize alternative frameworks.

Data analysis

Following data extraction, information from each article was systematically recorded in a spreadsheet for analysis based on descriptive and thematic categories. A variety of qualitative research synthesis methods exist (Barnett-Page & Thomas, 2009). Framework Synthesis (Dixon-Woods, 2011) was chosen for its effectiveness with large datasets. This method utilizes a pre-defined framework to analyse collaboration across sectors and levels.

Vocabulary analysis allowed for inferring collaboration arrangements and subsequent positioning within the 2x2 matrix. Four categories emerged: multi-level to multi-sector (ML-MS), single-level to multi-sector (SL-MS), multi-level to single-sector (ML-SS), and single-level to single-sector (SL-SS). Examples of ML-MS collaborations involved actors from various levels (SNL/SN/SL/NL) working with actors across multiple sectors (private and third sectors). Conversely, SL-MS collaborations involved actors from a single level (S/N/L) collaborating with actors from multiple sectors. ML-SS collaborations involved actors across various levels working with actors from a single sector (Private or Third sectors). Similarly, SL-SS collaborations involved actors from a single level working with actors from a single sector.

The analysis identified a dominance of ML-MS and SL-MS collaborations, comprising 86% (80 out of 92) of the arrangements. Conversely, ML-SS and SL-SS collaborations were far less common (7% each, 6 studies). The review focus solely on ML-MS and SL-MS arrangements due to their prevalence. While ML-SS and SL-SS arrangements are included in the descriptive summary, they are excluded from further analysis due to limited sample size. To examine key dimensions within these dominant collaboration arrangements, a "who-how-what" framework was applied to the remaining 80 articles.

FINDINGS

Descriptive summary

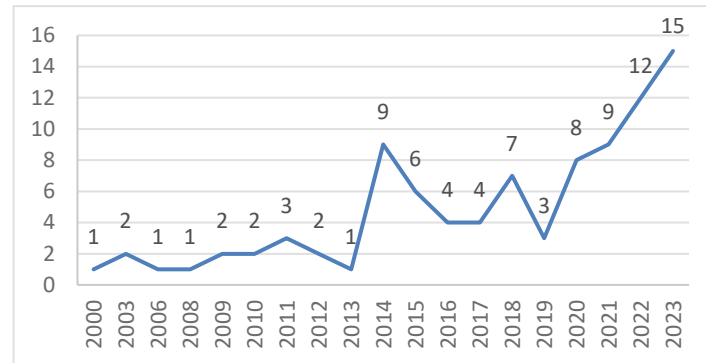


Fig3. cumulative number of publications per year (Source(s): Own creation).

A rising publication trend (Figure 3) indicates growing scholarly interest. Prior to 2014, few articles (1-3 annually) were published. Since then, publications have increased, with over half published in this period, peaking at 15 in 2023. Following Petersen et al. (2008), articles were classified as theoretical (proposing new concepts/theories; n=13) or empirical (focusing on validation, evaluation, solution, or experience; n=79). Research methods were then categorized as quantitative or qualitative (Neuman, 2014; Thiel, 2022), with mixed methods acknowledged (Creswell & Creswell, 2018; Morgan, 2014; Riccucci, 2010). As Figure 4 shows, qualitative methods dominated (n=60), with case studies (n=25) being the most prevalent.

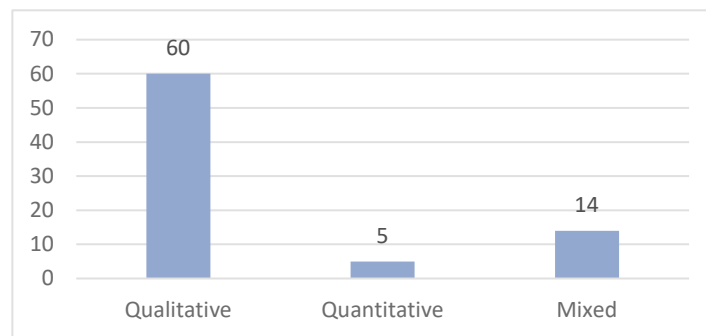


Fig4. research methods employed in reviewed articles (Source(s): Own creation).

The geographic scope of the studies primarily focused on single countries (n=68) and multi-countries (n=11). Single-country studies leaned towards Western nations (n=37), with the US (n=8) and UK (n=5) most frequent. Conversely, 31 studies explored non-Western countries. Multi-countries studies include those solely in Western nations (n=8) and those encompassing various regions (n=3), such as Asia and Africa (Amaruzaman et al., 2022), or combinations like Latin America (Urcuqui-Bustamante et al., 2021), or even Western and Latin American countries (Kauark-Fontes et al., 2023). Environment (n=16), health (n=14), and urban development (n=9) were the main sectors, with a rise in multi-sector approaches (n=9). Single studies also addressed specific sectors, including foreign affairs (Ahmad Shabudin et al., 2020), regional development (Arrona et al., 2020), security (Waisová, 2013), art (Donelli et al., 2021), and labour (Lidén et al., 2015).

Alignment of studies to the vertical-horizontal actor collaboration framework

Thematic analysis of the identified articles revealed a concentration on ML-MS and SL-MS collaboration arrangements (80 of 92 studies). These categories encompassed most studies (47 on ML-MS and 33 on SL-MS). To facilitate a deeper exploration of vertical-horizontal actor collaboration – actors involved (who), collaboration levers (how), and collaboration purpose and context (what) – the "who-how-what" framework guided the thematic analysis.

Multi-level to multi sector arrangement (ML-MS)

The actor involved in collaboration arrangement (who)

Figure 5 highlights a spectrum of actors involved in ML-MS collaborations, with national and local actors dominating (n=47) and participating in all studies. Supranational actors, including international

organizations e.g., the United Nations and its affiliates (Waisová, 2013), regional bodies e.g., the European Union (Forino et al., 2015), and international aid organizations (Bwimana, 2017), participate in a subset of these collaborations (n=8). Nationally, actors included central government entities. While local actors comprised provincial/state/regional and municipal/regency governments. Horizontally, all sectors are engaged. Notably, some studies extend beyond national multi-sector (MS-N) collaborations to involve international actors from private sector e.g., multi-national corporations (Cosens et al., 2018), third sector e.g., international NGOs (Rodriguez-Ward et al., 2018), and public sector e.g., agencies of foreign governments (Bevilacqua et al., 2020), forming a multi-sector international context (MS-I). This highlights the dominance of national/local actors but also the potential for broader, well-resourced collaborations.

The lever of collaboration (how)

ML-MS collaborations (n=47) employed all five key levers with varying frequencies, with all studies using at least two levers except one studies (Baker et al., 2020). Three even utilized all five (Agranoff & Mcguire, 2003; Iedema et al., 2017; Ranade & Hudson, 2003). RGP were least frequent (27 studies), followed by trust and boundary spanning (28 each). While power & authority (34 studies) and projects (32 studies) were more common levers. This pattern shifted when excluding supranational actors: boundary spanning became least used (22), while trust plummeted to the least used (n=3) in collaborations solely with international

ML-MS Collaboration																					
NO	paper ID	WHO								HOW										WHAT	
		LEVEL(S)			SECTOR(S)					LEVER(S)						CONTEXT	PURPOSES				
		S	N	L	P		T			FG	T	PA	RGP	P	BS						
					N	I	N	I													
1	24	X	X	X	X	-	X	X	X	X	X	-	X	X	X	environment issues (n=15)	AGENDA SETTING (complexity (n=8), crises management (n=5))	POLICY FORMULATION (policy objective, (n=2) policy making (n=1), environment govt (n=7))			
2	26	X	X	X	X	-	X	X	-	-	X	-	X	X	X						
3	28	X	X	X	X	X	X	X	X	-	-	X	X	X	X						
4	31	X	X	X	X	X	X	X	X	-	X	X	-	-	X						
5	45	X	X	X	X	-	X	X	X	X	X	X	-	X	X						
6	21	X	X	X	X	-	X	X	-	-	-	X	X	-	-						
7	36	X	X	X	X	-	X	X	-	-	-	X	X	X	-						
8	15	X	X	X	X	-	X	-	-	-	-	X	-	X	X						
9	29	-	X	X	X	-	X	-	-	-	-	X	X	X	X						
10	33	-	X	X	X	-	X	-	-	-	X	-	X	X	X						
11	44	-	X	X	X	-	X	-	-	-	X	X	-	X	X						
12	50	-	X	X	X	-	X	-	-	-	-	X	-	-	-						
13	54	-	X	X	X	-	X	-	-	-	X	X	X	X	-						
14	60	-	X	X	X	-	X	-	-	-	X	X	-	X	X						
15	69	-	X	X	X	-	X	-	-	-	X	-	X	-	X						
16	77	-	X	X	X	-	X	-	-	-	X	-	X	X	X						
17	42	-	X	X	X	X	X	-	-	-	X	-	X	X	X						
18	87	-	X	X	X	-	X	-	-	-	-	X	-	X	X						
19	5	-	X	X	X	-	X	-	-	-	X	X	X	-	X	HEALTH POLICY (n=10)	DECISION MAKING (n=5)	POLICY IMPLEMENTATION (policy implements (n=6), service delivery (n=8))			
20	7	-	X	X	X	-	X	-	-	-	-	X	-	X	-						
21	37	-	X	X	X	-	X	-	-	-	X	X	X	X	X						
22	59	-	X	X	X	-	X	-	-	-	X	-	X	X	X						
23	67	-	X	X	X	-	X	-	-	-	-	X	X	-	X						
24	74	-	X	X	X	-	X	-	-	-	X	X	X	X	-						
25	80	-	X	X	X	-	X	-	-	-	-	X	X	X	X						
26	82	-	X	X	X	-	X	-	-	-	-	X	-	X	-						
27	56	-	X	X	X	-	X	-	-	-	X	X	X	X	-						
28	72	-	X	X	X	-	X	-	-	-	-	-	X	X	-						
29	32	-	X	X	X	-	X	-	-	-	-	-	X	X	-	URBAN POLICY (n=2)	POLICY EVALUATION (innovation (n=5))				
30	13	-	X	X	X	-	X	-	-	-	X	X	-	-	-						
31	6	-	X	X	X	-	X	-	-	-	X	X	X	-	-						
32	41	-	X	X	X	-	X	-	-	-	X	X	X	-	X						
33	16	-	X	X	X	-	X	-	-	-	-	X	-	X	-						
34	83	-	X	X	X	-	X	-	-	-	X	-	-	X	X						
35	9	-	X	X	X	-	X	-	-	-	X	X	-	-	-						
36	17	-	X	X	X	-	X	-	-	-	-	X	-	-	X						
37	3	-	X	X	X	-	X	-	-	-	X	X	X	X	X	OTHER POLICY (education (n=1), housing (n=1), IT (n=2), security (n=1), social (n=1), transportasi (n=2), energy (n=1))					
38	4	-	X	X	X	-	X	-	-	-	X	X	-	X	X						
39	11	-	X	X	X	-	X	-	-	-	-	X	X	-	-						
40	18	-	X	X	X	-	X	-	-	-	-	X	-	X	-						
41	91	-	X	X	X	-	X	-	-	-	X	X	-	-	X						
42	8	-	X	X	X	-	X	-	-	-	X	X	-	-	X						
43	64	-	X	X	X	-	X	-	-	-	X	-	-	X	X						
44	2	-	X	X	X	-	X	-	-	-	X	X	X	X	X						
45	39	-	X	X	X	-	X	-	-	-	X	X	X	-	-						
46	34	-	X	X	X	-	X	-	-	-	-	X	-	X	-						
47	52	-	X	X	X	-	X	-	-	-	X	-	X	X	-	OTHERS (multi (n=5), undefined (n=2), inter dev (n=1), NDG (n=1), water (n=2))					
N=national; I=International; FG=Foreign Government																					

Fig5. multi-levels to multi sectors; (Source(s): Own creation))

actors, where power & authority, projects, and boundary spanning all became most frequent (6 each). This suggests a fundamental shift in collaboration dynamics with international actors, possibly due to pre-existing power imbalances, short-term goals, and cultural challenges.

The purpose and context of collaboration (what)

The study primarily examined environmental issues (n=15), health policy (n=10), and multi-context collaborations (n=5). Other policy areas like housing (Koffijberg et al., 2012), education (Matsiliza, 2016), security (Waisová, 2013) and social (Easter et al., 2023) were also explored. National development goals (Auriacombe & Meyer, 2020) and international development (Baud, 2016) were also addressed. Interestingly, two studies presented theoretical models (undefined) (Park & Lim, 2018; Ranade & Hudson, 2003). Revealing complexity and service delivery were the most frequent purposes (n=8 each), followed by environmental governance (n=7). Notably, one study focused solely on policymaking (Reymond et al., 2020).

Single level to multi sector arrangement (SL-MS)

The actor involved in collaboration arrangement (who)

Compared to ML-MS collaborations, SL-MS collaborations involve a less complex landscape of actors (**Figure 6**). Vertically, they primarily involve national or local actors, with local governments appearing in 26 of 33 studies. Notably, national authorities are the sole actors in only seven studies. Horizontally, these collaborations typically encompass private and third-sector actors within the national context. One exception involves an international actor collaborating with a local government from another city (Bevilacqua et al., 2020). This focus on local actors with national support suggests SL-MS collaborations target specific localities, leveraging domestic resources.

The lever of collaboration (how)

Similar to ML-MS collaborations, all 33 analyzed SL-MS studies employed at least two key collaboration levers, with only a few relying solely on one. levers (n=30). Interestingly, unlike the single instance of all five levers being used in ML-MS studies, only one study in SL-MS leveraged all five (Haveri & Anttiroiko, 2023). Projects emerged as the most frequently used lever (n=22), followed by power & authority (n=21). Conversely, rules & guidance principles were employed least often (n=10). Additionally, studies focusing solely on national actors showed a distinct preference for trust and boundary spanning roles (n=5 each) as

SL-MS Collaboration																		
NO	Paper ID	WHO							HOW							CONTEXT	WHAT	
		LEVEL(S)			SECTOR(S)				LEVER(S)					PURPOSES				
		S	N	L	P		T		FG	T	PA	RGP	P		BS			
					N	I	N	I										
1	23	-	X	-	X	-	X	-	-	-	X	-	X	environment issues (n=5)	AGENDA SETTING (complexity (n=6), crises management (n=1))			
2	71	-	X	-	X	-	X	-	-	X	-	-	X				X	
3	20	-	X	-	X	-	X	-	-	-	X	-	-				X	
4	47	-	X	-	X	-	X	-	-	X	-	-	X				-	
5	49	-	X	-	X	-	X	-	-	X	X	-	-				X	
6	1	-	X	-	X	-	X	-	-	X	-	-	-	-	HEALTH POLICY (n=5)	POLICY FORMULATION (policy objective (n=1), policy making (n=3), environment govt (n=3), strategic partnership (n=1))		
7	43	-	X	-	X	-	X	-	-	X	X	-	-	X				
8	66	-	-	X	X	-	X	-	-	X	X	X	-	X				
9	85	-	-	X	X	-	X	-	-	-	X	X	-	X				
10	90	-	-	X	X	-	X	-	-	X	X	-	X	X				
11	19	-	-	X	X	-	X	-	-	-	X	-	X	X	URBAN POLICY (n=9)	DECISION MAKING (n=4)		
12	40	-	-	X	X	-	X	-	-	-	X	X	-	X				
13	46	-	-	X	X	-	X	-	-	-	X	-	-	X				
14	86	-	-	X	X	-	X	-	-	-	X	-	X	-				
15	12	-	-	X	X	-	X	-	-	-	X	-	X	-				
16	51	-	-	X	X	-	X	-	-	X	-	-	X	X	OTHER POLICY (art, financial, research, energy (n=4), food (n=2))	POLICY IMPLEMENTATION (policy implement (n=4), service delivery (n=8))		
17	62	-	-	X	X	-	X	-	-	X	-	X	X	X				
18	75	-	-	X	X	-	X	-	-	X	-	-	X	-				
19	76	-	-	X	X	-	X	-	-	X	X	-	X	X				
20	79	-	-	X	X	-	X	-	-	X	X	X	X	X				
21	81	-	-	X	X	-	X	-	-	-	-	-	X	-	OTHERS (multi (n=2), undefined (n=1), water (n=2))	POLICY EVALUATION (innovation (n=2))		
22	84	-	-	X	X	-	X	-	-	X	-	X	-	-				
23	48	-	-	X	X	-	X	-	X	X	-	X	-	-				
24	35	-	-	X	X	-	X	-	-	-	X	-	X	-				
25	58	-	-	X	X	-	X	-	-	X	X	-	X	-				
26	61	-	-	X	X	-	X	-	-	-	-	-	X	-				
27	70	-	-	X	X	-	X	-	-	-	-	X	X	X				
28	88	-	-	X	X	-	X	-	-	X	X	-	-	X				
29	92	-	-	X	X	-	X	-	-	-	X	X	X	-				
30	63	-	-	X	X	-	X	-	-	X	-	-	X	-				
31	53	-	-	X	X	-	X	-	-	-	X	-	-	X				
32	89	-	-	X	X	-	X	-	-	X	X	-	-	X				
33	14	-	-	X	X	-	X	-	-	X	X	X	X	-				
N=national; I=International; FG=Foreign Government																		

N=national; I=International; FG=Foreign Government

Fig6.single level to multi sectors collaboration (Source(s): Own creation))

the most used levers, with rules & guidance principles remaining the least common (n=1). This suggests SL-MS collaborations prioritize project-based action (likely due to local issues) and navigate power dynamics. When national actors collaborate, trust and communication become paramount.

The purpose and context of collaboration (what)

SL-MS collaborations exhibit a distinct focus compared to ML-MS, with urban policy (n=9), health policy, and environmental issues (n=5 each) dominating the contexts. Studies also explored diverse contexts (n=1 per each), including art policy (Donelli et al., 2021), financial policy (Penny, 2017), and research policy (Ahmad Shabudin et al., 2020). One study focused on a theoretical concept without a defined context for collaboration (undefined). Service delivery (n=8) and revealing complexity (n=6) emerge as the most prevalent purposes, while a few studies target specific objectives, crisis management, or strategic partnerships. This focus on defined contexts and purposes underscores the targeted nature of SL-MS collaborations, enabling them to leverage local resources for addressing unique needs within a specific area.

DISCUSSION

Analysis of multi-actor collaborations in governance network reveals a surge in scholarly interest since 2014 (peaking in 2023), reflecting the growing importance of collaboration for tackling complex and global policy challenges. Qualitative methods, particularly case studies, dominate the research, highlighting the need to understand the nuanced dynamics of these collaborations. Interestingly, a geographic bias towards Western nations emerges in the broader research pool (n=79/92 empirical studies). However, a closer look at studies examining collaboration arrangements (ML-MS & SL-MS, n=67/80) reveals a more balanced distribution, with non-Western contexts holding the majority (n=30) compared to Western nations (n=27), with multi-country studies representing a smaller portion (n=10). This suggests a maturing field of collaboration research in non-Western settings, potentially driven by the global nature of the challenges addressed and the need for collaboration across diverse regions.

This review synthesizes findings from 80 articles leveraging a 2x2 conceptual matrix and the 'who-how-what' framework examining actor involvement (ML-MS and SL-MS collaborations), combined effect of all collaboration levers, and varied context and purpose. Context (policy domains) and purpose (policy cycle stages) varied. The review identifies five policy domains and aligns purposes with the stages. It explores how context shapes public sector collaboration arrangements across policy cycles stages (Figure 5 & 6). Solid lines indicate linkages across all combinations, dashed lines within subsets. ML-MS collaborations (environment and others) address all stages, while others might be limited.

Environmental issues exhibit similar trends in collaboration levers across ML-MS and SL-MS arrangements. Boundary spanners are most common, but distinctions emerge. ML-MS collaborations with international actors (SNL-PT) find boundary spanners and projects most effective for tackling environmental challenges (climate change, disaster management, forest management). These boundary spanners (working groups, alliances) bridge communication gaps and facilitate information sharing (Rodriguez-Ward et al., 2018). Projects (climate change initiatives) provide a concrete focus for collaboration, enabling knowledge exchange, resource allocation, and capacity building (Ungureanu et al., 2020). In contrast, NL-PT collaborations leverage a broader range of levers. While projects and boundary spanners remain important, trust building, and rules & guiding principles gain prominence in the national context. Shared cultural and institutional backgrounds, coupled with the focus on long-term partnerships for national challenges, necessitate a stable and transparent collaborative environment (Amaruzaman et al., 2022; Barraclough et al., 2022; Cosens et al., 2018). This explains the emphasis on trust building and clear frameworks. SL-MS collaborations also show variation. N-PT arrangements prioritize boundary spanners for communication (Ros-Tonen et al., 2014; Schuster & Mossig, 2022). L-PT collaborations add local government power & authority to incentivize participation, while still relying on boundary spanners for knowledge exchange, especially when local expertise is crucial (Eikelenboom & Long, 2023; Mukhlis & Perdana, 2022; Zhou et al., 2023). Notably, ML-MS collaborations address the entire policy cycle, whereas SL-MS focus on policy formulation and implementation.

The health policy presents a distinct picture. Power and authority reign supreme across collaboration arrangements (ML-MS and SL-MS) for robust regulations and enforcement (Janse van Rensburg et al., 2018; Kickbusch & Szabo, 2014; Moynihan, 2008). While both utilize power and authority, ML-MS arrangements with international actors add rules & guiding principles for consistency and transparency (Kapucu & Hu, 2022; Ku et al., 2022). National contexts within ML-MS leverage projects for resource mobilization and specific initiatives (Bwimana, 2017; Criado & Guevara-Gómez, 2021). Conversely, SL-MS collaborations rely on both power & authority and boundary spanners to bridge communication gaps between diverse stakeholders with varying expertise (Sax, 2014; Sheaff et al., 2014). Interestingly, both collaboration types cover agenda setting and implementation stages, but ML-MS extends to policy evaluation, while SL-MS focuses on decision-making. Interestingly, urban policy context presents a unique case with a single collaboration subcategory for both ML-MS and SL-MS (Arrona et al., 2020;

van de Meene et al., 2020), likely due to its focus on concrete implementation (compared to broader contexts). ML-MS (NL-PT) utilizes rules & principles for development roadmaps and projects for action (Olivier & Schlager, 2022). Conversely, L-PT (SL-MS) prioritizes projects addressing local challenges and fosters trust (Bradley et al., 2022; Razzaghi Asl & Pearsall, 2022). Within this context, ML-MS focuses on agenda setting and implementation, while SL-MS covers all stages except evaluation.

For 'Other policies' (education, housing, IT), ML-MS collaborations prioritize centralized approaches with power & authority, seeking stakeholder buy-in through trust building (Koffijberg et al., 2012; Waisová, 2013). However, specific policy areas exhibit variation. Education emphasizes standardization with rules & principles and projects (Matsiliza, 2016), while social policy relied on trust, projects, and boundary spanners for community engagement (Easter et al., 2023). SL-MS collaborations showcase similar variation. N-PT collaborations prioritized trust building for long-term partnerships, context-specific adaptation, and shared values, utilizing a broader range of levers except rules & guiding principles (Ahmad Shabudin et al., 2020; Herrera et al., 2019). Conversely, L-PT collaborations emphasized projects for concrete action, leveraging local government power & authority to incentivize participation (Abreu et al., 2021; Francis et al., 2022; Penny, 2017; Santos-Larrazabal & Basterretxea, 2023). Notably, collaboration across all policy stages is observed in ML-MS, while SL-MS excludes policy evaluation.

Similar to urban policy, 'Other' contexts feature a single ML-MS subcategory (NL-PT) prioritizing national-local action via power & authority. Trust building supports collaboration throughout policy cycles except policy evaluation (Agranoff & McGuire, 2003; Fish et al., 2010; Ranade & Hudson, 2003). National development goals (NDG) deviate, using a combination of trust, rules & principles, and projects to foster ownership, progress, and action frameworks (Auriacombe & Meyer, 2020). SL-MS arrangements again exhibit variation for agenda setting, policy implementation and evaluation. N-PT collaborations leverage trust building, likely due to established relationships with private and third-sector actors. Power & authority and boundary spanners complement trust, with national governments potentially guiding agendas and boundary spanners bridging communication gaps (Jackson & Stainsby, 2000; Lee, 2018). L-PT collaborations emphasize power & authority and projects, prioritizing local needs and action. Trust building and boundary spanners remain crucial for diverse interests and local expertise (Pringle et al., 2023; Vabo & Røiseland, 2012; Woldesenbet, 2020).

Following propositions highlight the importance of considering context, collaboration type, and targeted policy stages when designing and implementing vertical-horizontal collaborations in governance network.

1. **Context shapes collaboration arrangements across actors, levers, and policy cycle stages:** collaboration arrangements and context significantly influence the actors involved, collaboration levers utilized, and the policy cycle stages addressed.
2. **International actors and complex challenges:** International actors are more likely to be involved in collaborations addressing complex policy challenges with global implications. However, the dynamics of dominant powers can exert significant influence over international decision-making processes. For instance, the veto power wielded by certain states within international organizations, such as the United Nations, can hinder the adoption of policies that do not align with their interests.
3. **Policy cycle stages vary:** The policy cycle stages addressed in collaborations vary depending on the context and collaboration arrangements. ML-MS collaborations often encompass more stages, while SL-MS collaborations might focus on specific stages.

Study limitation

This study acknowledges several inherent limitations. Firstly, the chosen contexts serve as illustrative examples, offering valuable insights but generalizability to all contexts may be limited (limitation 1). Secondly, the data and sources employed might possess limitations in geographic scope below the nation-state or focus on specific policy areas (limitation 2). Finally, collaboration arrangements are inherently dynamic, subject to change over time due to factors like technological advancements or evolving policy priorities (limitation 3). Despite these limitations, the analysis offers a valuable framework for comprehending the significance of context-specific of vertical-horizontal actor collaboration arrangements in fostering successful governance network.

CONCLUDING REMARKS AND RESEARCH AGENDA

The interplay between context and collaboration arrangements significantly shapes how multi-actor collaborations are governed within governance network. Collaboration arrangements, influenced by context, determine the actors involved, collaboration levers, and targeted stages of policy cycles. International collaborations tackling complex global challenges often leverage boundary spanners and projects to facilitate communication and knowledge sharing, fostering a governance approach built on

capacity building. In contrast, national contexts emphasize trust building and clear frameworks, leading to long-term partnerships focused on addressing national challenges. The policy cycle stages addressed also differ, with collaborations likely encompassing the entire cycle for issues with broader implications (ML-MS), while others might focus on specific stages (SL-MS).

The study highlights the critical role of context and collaboration arrangements in governance network. While it identifies various arrangements, future research can delve into their effectiveness across contexts to determine the most successful approaches for specific challenges. Additionally, exploring how these arrangements might evolve due to future changes and conducting deeper analyses within specific sub-domains (e.g., transportation within "other policies") could provide further insights into the nuances and adaptability of collaboration within governance network. Finally, examining how broader geopolitical trends and power dynamics influence horizontal collaborations among multiple countries, future studies can contribute to a more comprehensive understanding of governance networks in a globalized world. Potential avenues for future research could include investigating the ways in which different countries and regions respond to the challenges posed by global power dynamics.

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