Geography and Sustainability 3 (2022) 1–12

Contents lists available at ScienceDirect

Geography and Sustainability

journal homepage: www.elsevier.com/locate/geosus

Stakeholders' power in the networking structuration processes of the urban resilience concept in Habitat III agenda (2012-2016)

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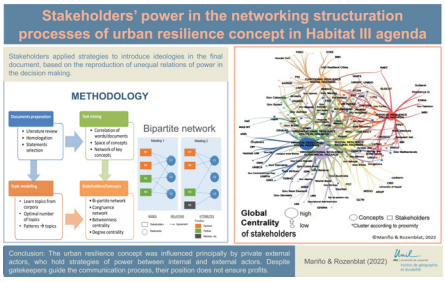
HIGHLIGHTS

- We analyze the actors influencing the Habitat III process between 2012 and 2016.
- We process 5,539 discourses from 290 stakeholders, in 357 events.
- We highlight dominant actors, gatekeepers, shadow actors and power holders.

GRAPHICAL ABSTRACT



ARTICLE INFO

Article history:
Received 24 August 2021
Received in revised form 8 February 2022
Accepted 9 February 2022
Available online 15 February 2022

Keywords:
Urban resilience
Cities
Habitat III
Urban agenda
Networks of power
Global

ABSTRACT

The urban resilience concept was introduced in 2016 as a key concept in the Habitat III New Urban Agenda for the next 20 years. We wonder how this urban resilience concept was elaborated and who influenced it the most? The preparatory events structured several stakeholders' networks. The relations between stakeholders allowed the flow of ideas in the consultation and production process. Some influential stakeholders strongly oriented definition of urban resilience concepts by taking power in the networking process of the consecutive meetings. The paper analyzes the network of stakeholders/concepts, during the building process between 2012 and 2016 (5,539 discourses from 290 stakeholders, in 357 events). The application of textual mining and machine learning topic modelling algorithm exposed the structure of the principal topics for building the concept of urban resilience, and presented how relations of main stakeholders with funders was crucial for the investment in policy interventions. Therefore, we underlined for the first time in an empirical way, different kinds of actors' power in the construction process that supported the Habitat III resilience concept. We demonstrated how far some official stakeholders, but also external and private ones, oriented the construction of ideologies to validate the knowledge that supported the related actions in laboratory cities.

1. AIntroduction

Since the launch of the Cities Resilience Profiling Programme (CRPP) in 2012, and the Habitat III agenda (Habitat III, 2015a) in 2016, several scientific and policy papers redefined urban resilience in different dimensions with engineering approach of cities (Chelleri, 2012; Mehmood, 2016), environmental risks (Meerow et al., 2016; Taylor et al., 2018) , social reactions and urban economies' evolution (Dubé and Polèse, 2016; Rogov and Rozenblat, 2018). However, the initial Habitat III resilience concept and its implementation in laboratory-cities (*100 resilient cities*) had a large influence on the development of visions around urban resilience in different parts of the world, from continental level (Neto-Henriques et al., 2020) to local level. Similar to Neto-Henriques et al. (2020), numerous studies analyzed the influence of the Habitat III agenda on several implementations of urban resiliencewith developing indicators of Sustainable Development Goals (Revi, 2017; Mitincu et al., 2021).

However, the conceptual building process *per se*, constituted by the complex interactions of actors during the four years of meetings organized by UN-Habitat, is not yet clarified (Kuecker, 2015). According to strategic alignments, interactions during the UN-Habitat III meetings generated forces of power to strength the inclusion/exclusion of

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https://doi.org/10.1016/j.geosus.2022.02.001

ideologies focusing on resilience concept (Kuecker, 2015). Deepening this understanding would permit international organizations in the future, to coordinate such large process in large communities of stakeholders, in a higher inclusive and opening way.

Thus, it is essential to come back to the source of CRPP and UN-Habitat programs to understand how the concept was built in the social making process of UN-Habitat Agenda for 2030, during the 5,539 meetings that were organized. Over the statement suggested by Leitner et al. (2018), Rockefeller foundation with its "100 resilient cities" program influenced the final decisions. If this assumption is correct, how, and which orientation of the conceptual approach was aligned? Did other actors influence the final UN-Habitat Agenda? In which direction did they lead? Which topics were supported by whom?

This paper seeks to underline the complex conceptual construction process of the UN-Habitat Agenda 2030 made by the network of stakeholders' involved. In this network perspective, we differentiate different roles of stakeholders following the propositions of Castells (2009) on the powers in networks: 1) their dominant role in the network ("network power"), 2) their influence as gatekeepers on the inclusion/exclusion of new ideas and participants ("networking power"), 3) their capacity of shadow domination ("networked power"), 4) their ability to create strategic alliances as power holders ("network-making power"). The institutions or companies playing these roles were identified by building the network of stakeholders and concepts based on the analysis of the 5,539 discourses and documents including 290 stakeholders who participated in the 357 events that were organized during the Habitat III process between 2012 and 2016.

The paper starts from recalling how far the resilience concept moved and transformed in the literature during the beginning of the 2000s and the condition of its introduction in the Habitat III process (section 2). Then, we question the different roles that some strategic actors endorsed in the urban resilience definition and implementation (section 3). After explaining the methodology composed by text mining, machine learning, and network analyses (section 4), we present the results of the influences of the main actors and the concepts that led to the Habitat 2030 agreement (section 5). The discussion of these actors' game will be discussed to enlighten the legacy patterns of this political network process and the perspectives to improve the process design for future programs (section 6).

2. A political process to build resilience policies

The resilience framework was formalized in the process of Habitat III agenda and consecutive meetings, and finally included in various technical strategic documents. The resilience concept evolved during this process enlightening some political and ideological issues and powers in the discourses.

2.1. The political process of Habitat III agenda

The political context of urban resilience is fundamental to conduct policies and decisions (Fig.1). The initial implementation of Habitat III agenda created this specific political context, through the City Resilience Profiling Programme (CRPP) (UN-Habitat, 2012a), selecting ten pilot cities to test and experiment resilient conditions. The cities were: Portmore—Jamaica, Barcelona—Spain, Beirut—Lebanon, Tehran—Iran, Dagupan—Philippines, Concepcion & Talcahuano—Chile, Lokoja— Nigeria, Dar es Salaam—Tanzania, Wellington—New Zealand (Mclaughlin, 2013). The stakeholders' network of CRPP) started in 2012 with key partnerships, whose founders were UN International Strategy for Disaster Reduction (UNISDR) Secretariat, Red Cross/ Red Crescent Movement, Habitat Partner University Initiative institutions, private sector representatives from the insurance, IT, energy, and natural resource industries, as well as city networks including United Cities and Local Governments (UCLG), Metropolis, and the C40 Cities Climate Leadership Group. Also, CRPP was coordinated by external partners as World Bank, C40 Cities Climate Leadership Group, and Rockefeller Foundation. Furthermore, these organizations worked with over 300 local governments (UN-Habitat, 2012a) and with external programs, such as World Bank's Creditworthiness Academy, Rockefeller's 100 Resilient Cities Initiative, and the C40's City Director program. In addition, the General Assembly of UN in the resolution 67/216 (2012) encouraged relevant active participation of experts, defining major groups and non-governmental organizations in consultative status with the Economic and Social Council (ECOSOC). This inclusion of the group of experts and accredited partners in Habitat III provided the process legitimization.

The World Urban Campaign (WUC) instituted a platform to share policies on urban development and raise in October 2014 the global partnership platform (UN-Habitat, 2012b). This platform became a tool to manage the involving process of groups, including governments, private actors, and civil society like youth and women's groups. This platform provided the vision to create a "network of networks", reorganizing the groups of partners; and, it took the slogan to "unite to heart" for proposing new categories of stakeholders (UN-Habitat, 2012b). Stakeholders in this context could create new networks by themselves, while Urban Thinkers Campus involved 7,'602 participants from 2,'256 organizations of 122 countries (UN-Habitat, 2012b). Also, reports concluded that 135 partners signed up for the World Urban Campaign, 4 Sponsors, 40 Lead partners, 66 Associate partners, 20 Members and 5 Media partners (Habitat III, 2015b). From August 2015 to February 2016 a group of 200 experts supported the process to develop the "policy units", and created the official technical framework called the issue papers, whereby all countries' members based their proposals for the New Agenda (Citiscope, 2016). Most organizations listed as policy makers, including representatives of universities and grassroots, were heading technological platforms for monitoring and measuring indicators.

In October 2016 (UN-Habitat, 2016), the overall structure of key actors was created with 1,423 members (1,100 organizations and 323 individuals), 53,000 networks and 169 official partners (5 Sponsors, 47 Lead partners, 92 Associate Partners, 20 Members and 5 Media Partners). Finally, on February 2017 the WUC web page reported 183 partners founding the Constituent Groups, and an addition of 105 institutions as Associated Partners (UN-Habitat, 2012b).

In parallel, the official events dedicated to preparatory committees (PrepCom) included authorities and decision makers, who presented discourses on behalf of each country member. Inside these official events grouping central actors with authority and power, the WUC tried to create the conditions to introduce ideas of local actors, and to ensure decisions at different levels.

The final event in Quito, in October 2016, regrouped several in site events, each including the participation of 30 to 140 speakers. The New Urban Agenda hosted 90 countries members, 14 United Nations agencies and programmes, and 37 partners of major WUC groups, who presented finals discourses to support the agreement.

2.2. From the initial meaning of resilience to its implementation in Habitat III

Inspired by the flourished literature on resilience, Mclaughlin (2013) proposed a guide for the Habitat III agenda, with model of urban system. The urban system model was based on resilience dimensions and hazard approaches, each intersection linked a single space of concepts around urban resilience approach (CRPP, 2012). Urban system resilience is thus considered as an organizational, spatial, physical and functional dimensions of resilience, correlated to natural, technological, economic, social and political hazards (UN-Habitat, 2015).

The concept of resilience (Fig. 1) in its beginnings supported the physical conditions of an element as an indicator to evaluate variations and transformations under the effects of perturbation. The concept of resilience is consequently linked to dynamic physical conditions

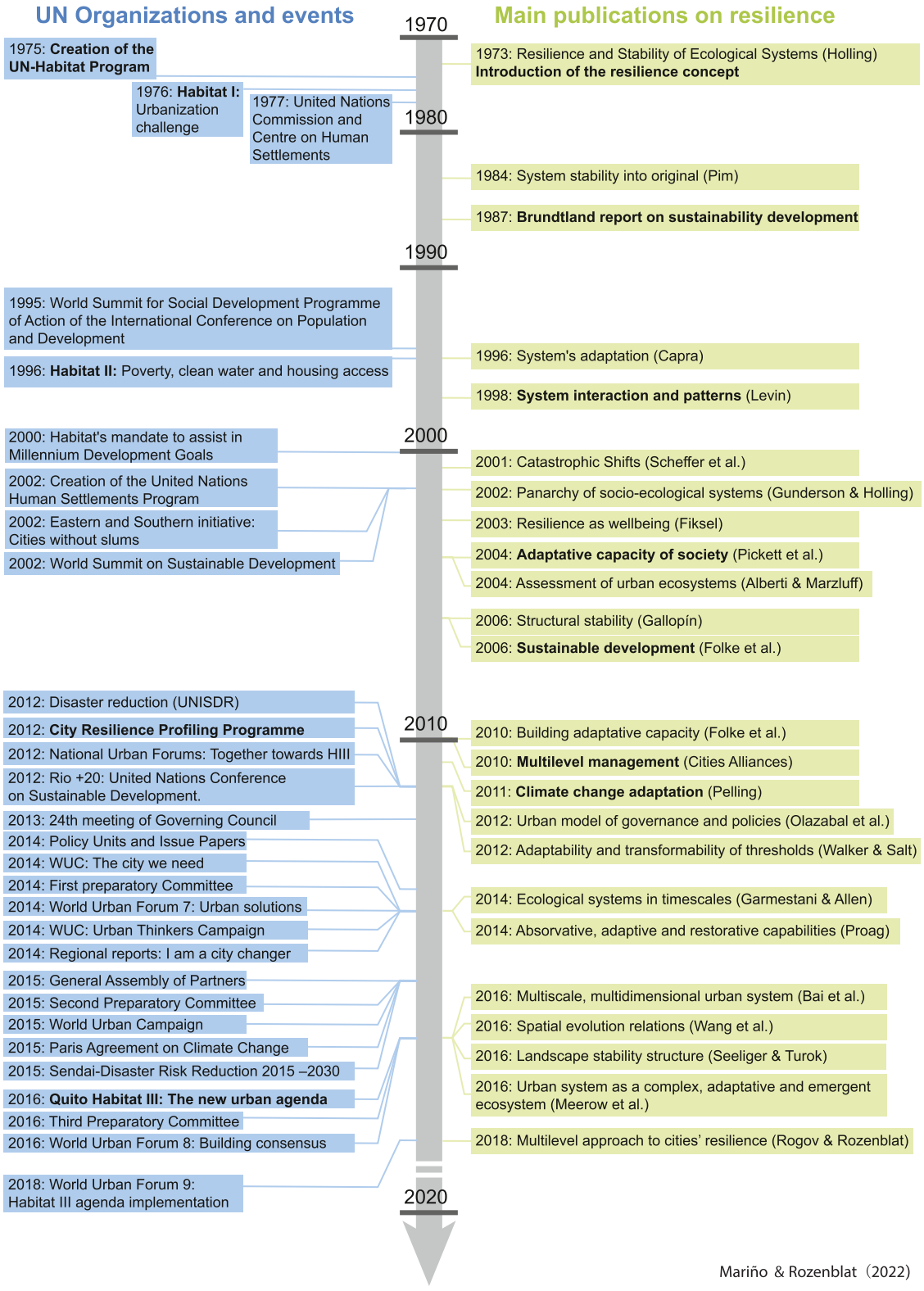


Fig. 1. Timeline of resilience conceptual approach and UN initiatives.

(Capra, 1996; Norris et al., 2008). Specifically, when resilience is applied to a system, it is evaluated by the changes and the transformation of its elements (Gallopín, 2006; Walker and Salt, 2012). Therefore, the indicators of these elements provide values about an ecosystems' ability to adapt and resist to impacts, and about how complex this systems react, change, and return to its natural condition over time (Folke et al., 2010; Holling, 1973; Levin, 1998; Walker and Salt, 2012). Hence, new concepts related to resilience were added, including the conception of cyclical adaptation and transitions of the system that not necessarily come back to previous states (Pelling, 2011;

Waker and Salt, 2012; Meerow and Newell, 2015). These visions framed the concept of resilience in an evolutionary context, linked to time transformation impact and to the evaluation of resilience's effects on a scale, that can cause changes at other scales (Gallopín, 2006; Rogov and Rozenblat, 2018; Wang et al., 2016).

In terms of policies, projects and investments, the interventions in urban systems can support (or at the opposite can affect) the urban system's responsiveness and adaptation, which are supposed to be towards a better level of resilience (Meerow et al., 2016), or towards more desirable city's configuration. In territorial contexts, the policies and investments are strongly influenced at different scales by stakeholders' visions, ideologies and decisions, and these stakeholders are the ones who can financially support major implementation processes.

Considering urban systems as ecosystems managed by social and political structures, some social networks and transition points reflect the actors' behavior in these structures. The interaction inside the social networks affects adaptations capabilities, emergence of subsystems and governance patterns (Waker et al., 2012). Also, the urban system is conditioned by the interaction between social networks, materials and energy flows, urban needs and socioeconomic dynamics, which are multiscale, interconnected and in constant evolution (Meerow et al., 2016). Subsequently, resilience defines the process of how the actions and process are transforming spaces at micro-meso-macro levels between which interactions take place in multi-level "synchronizations" (Rogov and Rozenblat, 2018).

2.3. Influences in the conceptual legitimation of urban resilience

Consequently, the initial framework of resilience proposed to Habitat III was a complex urban system, that was composed by many decisions linked to the multivariate reality and to complex relations. In this context, the stakeholders who participated to the agenda's building process, supported one or more concepts during a certain time, considering that actors can change their position in successive meetings, according to international relations and financial interest. In fact, the positions and mutual relations between actors evolved to legitimate their proposals of policies through the implementation of projects (Foucault, 1980;Escobar, 1985).

In the legitimation process of Habitat III, the power relations outline the behaviour of multiple actors via soft domination forces (Castells, 2009). Politics and stakeholders aimed at certain outcomes about transformative changes in urban system, but often without the multi-level urban resilience conception, neither with a long-term path-dependent process that evolve in interacting multi-level adaptive cycles. They rather preferred more direct actions leading to concrete outcomes in a clear political context.

3. Power of stakeholders in the ideological construction of the resilience concept

With the myriad of actors and the intertwined of events, one could wonder how different points of view interacted, how conflicts of interests and negotiations took place to create the emergence of the final agreement? Which stakeholders could gain power on the final decisions in these multitude of events?

Kuecker (2015) questioned these powers in the Habitat III policy-making process and criticized them as they "*show strong signs of continuity with previous systems of thought, especially the Western concept of development that has a long history of inequity and inequality within progressive gains in the global quality of life*" (p.2). He adds that "*this epistemological continuity is essential to the reproduction of power within the global system*" (p.2). Aiming to better understand these (re)productions of power in the Habitat III process, we propose to mobilize the theories of power in social networks, and to analyze their discourses, to identify the way stakeholders interacted in the construction of the resilience concept in the Habitat III agenda.

3.1. Powers in networks

In general, the construction of power in society is based on events where actors produce and reproduce power during practices of institutionalization, supporting relationships and applying legitimization mechanisms (Foucault, 1982). The network of power influences decisions in the configuration of coalitions that integrate group of actors who share a similar ideal construct (Hajer, 1993). In the ideological system some actors empower the development of policies and introduce their perspective on others networks (Hewitt, 2009).

The networking of actors linked by power in the construction of ideas is a process of alignment between ideologies and stakeholders. According to the communication power theory of Castells (2009), we distinguish four forms of power:

- The "networking power" is created by the forces of gatekeepers who, as influencers, control the inclusion or not of external actors.
- The "network power" is the application of standards for the social coordination between networked actors, settled by protocols of communication.
- The "networked power" is based on the social actors' influence over other social actors inside the network, based on the structural capacity of domination.
- The "network-making power" is the ability of actors to program networks and create strategic alliances.

To influence policy processes, the social construction of coalitions ("network-making power") is the core concept where most influential actors present a strong ideational congruence and legitimation process with experts support (Leifeld and Haunss, 2012). These influential actors develop discourses in policy making as "*an ensemble of ideas, concepts, and categories through which meaning is given to some phenomena*" (Hajer, 2002), we assume that by these discourses, they try to influence others and create strategic alliances.

In this perspective, Foucault (1980) established the discourse analysis as an approach of the social structure, describing the discursive practice as a part of the social construction (Diaz-Bone et al., 2008). The discrimination of ideas (Foucault, 1980; Guimerà et al., 2005) evaluates the discourses of stakeholders, being feasible to analyze the communication power (Castells, 2009), considering relations of inclusion/exclusion, protocols and channels of communication, structural capacity of domination and legitimization of ideologies, with the ability to re–program networks. It is thus a question of analyzing the discourses to understand the formation of power in social networks.

3.2. Discourse network analysis to reveal actors' roles in the construction of the resilience concept

The policy making through discourses is based on the argumentative context, where the positions of the argumentation's words contribute to create a set of storylines (Hajer, 2002). Storylines are endorsed by a legitimization process to form patterns and group of actors who play the role of subordinates (Leifeld, 2010). The importance of a connection between actors and concepts is part of the actor-centered and content-oriented approaches proposed by Leifeld (2010) in the discourse network analysis (DNA). It reveals which actor endorses which argument in the contextual debates. In addition, there are processes of legitimization of these storylines, as an exercise of power through knowledge, using the channels of information to create dominant relationships (Castells, 2009).

As a main assumption, we consider that the process of power construction resilience concept for the Habitat III agenda was founded by the series of events, where each event transmited and validated the theoretical basis of a framed knowledge ("network-making power"). The succession of events constituted the dynamic aspect of the networking, where each event created its own network, and the connection between

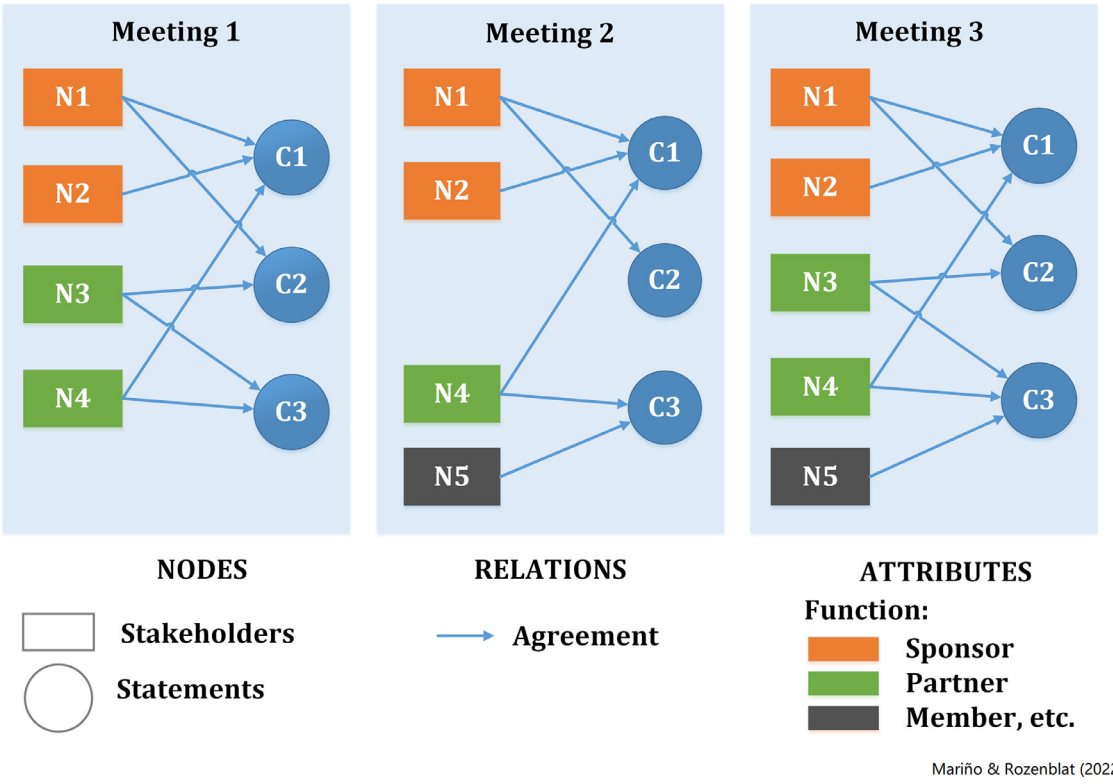


Fig. 2. Conceptual model of multidimensional bipartite network.

events established the pattern and the ideological evolution, participating to settle protocols of communication ("network power"). In addition, we assume that a process of indoctrination from experts to stakeholders was implemented ("networked power"), launching rules and reprogramming the social networks to establish certain views on resilience as main concepts in the technical documents ("networking power").

In this context, key stakeholders with a high influence can be considered as gatekeepers in the process of ideological mediation. They could use their capacity of influence according to their role played in the networks ("networked power"). Specifically, depending on who sponsors the projects, such gatekeepers supported different initiatives of CRPP tools, influencing other actors to join their visions and actions ("network-making power").

Therefore, the following analysis aims to define who were the main influent stakeholders in the construction process of the Habitat III resilience concept? What ideologies did these concepts encompass and how did they compete each other? The approach will thus consist in specifying the roles of actors in the processes of "network-making power", "network power", "networked power" and "networking power", linked to the emergence of certain concepts in the Habitat III agenda.

4. Methodology to identify the collective production of resilience concept

The methodology is based on the processes of participation of stakeholders to different events, highlighting the main actors who strongly oriented the conceptual definition of resilience. The construction of this analysis is based on 5,539 speeches in 5 languages of 290 stakeholders, presented in 357 events during the making of Habitat III from 2012 until 2016, with a total of 5 million statements of stakeholders' ideas.

4.1. The social networks around concepts and patterns

Discourses are compositions of several ideas, where some statements should be reduced (cleaning acknowledgements and greetings). The technique applied for the discrimination of ideas was based on methods of critical discourse analysis (Foucault, 1980; Guimerà et al., 2005). The application of social network theory analyzes the relationships between actors, using nodes and ties (Contractor et al., 2011; Rozenblat and Melancon, 2013). The nodes represent stakeholders and ties define the relations between them appearing when they share the same ideas in their statements (Fig. 2).

Concretely, it results a bipartite network where the nodes are stakeholders and concepts, and the meetings are multidimensional layers on time. The ties between stakeholders are established by their "affiliation" to a concept. Decomposing this networking process, stakeholders included ideas through discourses along several meetings: in a first moment (meeting 1) they proposed ideas. In some following meetings (meetings 2, 3…) these actors agreed and supported other actors' ideas, or they could include new ideas. The relations between stakeholders and ideas generate a bipartite network, varying in time along the meetings, where the evolution of the position of stakeholders and their discourse alignment defined their function in the ideas and their mutual relations.

4.3. Implementing and analyzing discourses

The collection of documents was treated with *Discourses Network Analyzer (DNA) software* (Leifeld, 2017). The text pre-processing started with the selection of the most important statements from each of the 5,539 discourses, where each statement was codified and categorized. The database was processed with textual mining, providing clean data to evaluate similarities and correlations between concepts, then we found the patterns between concepts using topic modelling, and finally we represent the relations with the bipartite network (Table 1):

a) Discourse pre-processing: The preparation of discourses improved the quality of the textual corpora. This treatment includes the tokenization of words, the reduction of stop words (i.e., articles, prepositions, others), the stemming and the lemmatization to normalize words, the *vectorization TF-IDF* to assign a relative weight per word

Table 1
Different steps of the applied methods.

General method	Technique	Results
a. Discourse pre-processing	a. Critical Discourse Analysis	Extraction of statements
b. Discourse analysis	b.1. Correspondence Analysis	Contingency table
	b.2. Similarity Analysis	Network of concepts
c. Networking ideas	c.1. Latent Dirichlet Allocation	Topic modelling
	c. 2. Gibs Sampling	Bipartite network
d. Networks' analyses	d. Global Centrality	Roles and positions

according its normalized frequency (Manning et al., 2009; Menaka and Radha, 2013; Vijayarani et al., 2015).

b) Discourse analysis: The corpora of the agreements and statements from discourses were analyzed using the software *Iramuteq*, implementing *Correspondence Analysis* and *Similarity Analysis*, to evaluate the network of concepts from the general framework until a reduced view of each resilience dimension and hazard approach (Marchand and Ratinaud, 2012; Morin, 2006; Teil, 1975; Camargo and Justo, 2016).

c) Networking ideas: The networking process between stakeholders and concepts was built using *Topic Modelling*, with the machine learning algorithm *Latent Dirichlet Allocation* to obtain the evolutionary pattern of the actors/concepts networks in all moments. The machine learning trend provides an optimal number of topics and the simulation process using *Gibbs sampling algorithm* allowed the assignation of a topic to each statement (Blei, 2012; Grün and Hornik, 2011; Knispelis, 2016; Ponweiser, 2012). The clustering revealing proximities between concepts used by the same actors was obtained with a Louvain approach (Blondel et al., 2008).

d) Networks' analyses: The software *Tulip* and the package *Statnet* in R were used for processing the networks' measures of centralities (degree centrality [number of linkages of a term/stakeholder] and betweenness centrality [number of shortest paths of the whole network passing through the term/stakeholder]). It allowed to establish positions and roles of stakeholders explained in section 4.5, and to represent them graphically (Freeman, 1980; Guimerà et al., 2005; Rozenblat and Melancon, 2013).

4.4. Two subsets of data

The analysis described previously was applied in two stages corresponding to two subsets of texts. The first subset, based on discourses of the international agreements[1] and on the Third Urban Agenda, produced the key concepts in the urban resilience framework at different moments. Then, we aggregated these concepts in clusters according to their co-frequency in the discourses, finding their similarity measures and we applied topic modelling (as described in section 4.3). It resulted in several clusters of topics, to which actors and topics were connected. These connections evaluate the specific orientations of actors in the ideological framework and their roles in the network (see section 4.5).

The second subset aimed at defining more specifically the involvement of actors in the Habitat III implementation. We used a second subset of data composed by discourses and documents of the WUC, all Preparatory Committees, Thematic Meetings, Policy Units, Habitat III agenda documents and the compilation of several documents of the CRPP. This second set of data provided information about the actors' sponsorships, investments and projects, allowing to build the network of funders of intervention in projects. This second stage permitted to identify stakeholders who supported decisions and who influenced the making process in the construction of the concepts, by their investments and by involving external/private actors (see section 4.5).

4.5. Evaluating the four kinds of power

In both analyses of data described previously, the roles of actors were identified according to two basic indices of social network analyses (Wasserman and Faust, 1994). The *Degree Centrality* is measured by the number of direct linkages of a node (an actor or a concept) in the network. It is a local centrality. The *Betweenness Centrality* of a node is the number of shortest paths linking all the nodes of the network passing through this node (Freeman, 1980). It is a global centrality.

The combinations of the degree (local) and the betweenness (global) centralities can be interpreted as roles in the network (Burt, 2005; Wasserman and Faust, 1994).

With the first subset of text, we identified:

- *Dominant actors* measured by some high local and global centralities. They characterize actors with a "Networked power" as defined above.
- *Gatekeepers* who keep a high level of global centrality (High Betweenness centrality) but are not locally important. They are essential intermediates in the "Networking power".
- The "shadows" or controllers are actors having a high local centrality despite maintaining a low global centrality (thus being quite peripheric). Thus, despite not being visibly central, they concentrate a "networked power" on certain parts of the networks of actors.

With the second subset of text, we outlined:

- The "network-making power" (or power holders) which concerns actors that can be identified by their investments, or because of their alliances in terms of sponsors and investment in projects.

5. The resilience concept's construction process and its main actors in the Habitat III agenda

The following analyses consist in identifying first the concepts of urban resilience approach (section 5.1), then positioning of actors according to their ideological proximities to concepts (section 5.2), and finally defining their roles (section 5.3).

5.1. Key concepts of urban resilience approach

In the first step, we identified the aggregation of terms with the topic modelling algorithm on the first set of data concerning the agreements and statements summarized in the United Nations' issue paper 15. The result shows a distribution of terms related to main topics, creating a space of concepts where each term is located according to its

[1] The 2030 Agenda for Sustainable Development, Addis Ababa Action Agenda, Paris Agreement, Sendai Framework for Disaster Risk Reduction 2015–2030, Programme of Action for Landlocked Developing Countries for the Decade 2014–2024, SIDS Accelerated Modalities of Action (SAMOA) Pathway, Istanbul Declaration, Conference on Sustainable Development Rio+20, Conference on Environment Development, International Conference on Population and Development, Fourth World Conference on Woman, Universal Declaration of Human Rights, Human Rights Millennium Declaration, World Summit Outcome 2005, World Summit for Social Development, World Summit on Sustainable Development.

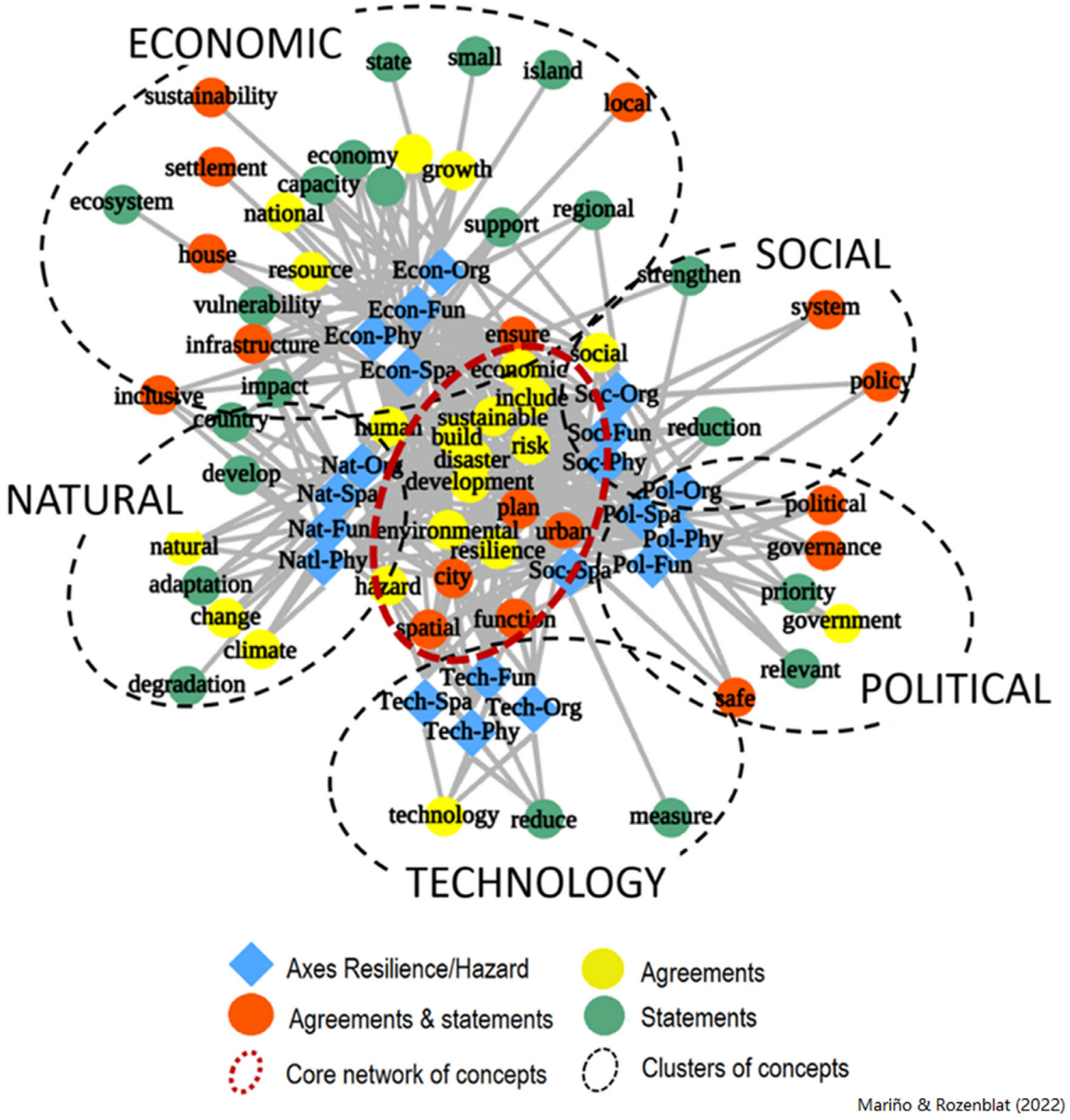


Fig. 3. Network of concepts for resilience dimensions and hazard approaches.

eigenvalue. The linkages represent the Jaccard similarity distance between the topics, and the clusters of concepts (the dashed lines) are based on the conceptual structure of the urban resilience axes and dimensions of United Nations (Fig. 3).

The core of the network concentrates most of the terms (circles) that shared a general idea, and we can conclude these terms conceptualize the core concept of the urban resilience approach. Without any surprise, the cluster around Economic hazards presents a relation with the physical resilience and is motivated by the effects of investments by most of the countries to recover from natural disasters. The clusters of *Political and technological* refer both to functional resilience, which are associated with methods to measure and control the level of resilience. The cluster of *Political* is specifically related with organizational and spatial resilience supporting the vision of governance and urban system as a regulatory framework.

5.2. Linking actors to conceptual frameworks

The statements extracted from the discourses resulted in 12 topics. The most central topic is the one related to the "*physical resilience-social hazard*". This topic was linked to 186 stakeholders and shared 718 links with other topics (degree centrality), concentrating 12.38% (7,263) of the total shortest paths of the graph (called betweenness centrality in network analysis). In second place, the "*organizational resilience and economic hazard*" approach concentrates around 10.46% of the shortest paths and share more than 600 links with other topics. The other most central concepts belong to topics more related to hazards approach, where the technological, natural, and social aspects are distinguised (Table 2).

The bipartite network of concepts and stakeholders (Fig. 4) presents a graph revealing the main stakeholders' affiliation to one or more urban resilience concepts. The more numerous concepts two actors conjointly support, the more similar those actors are in terms of ideologies, because they share the same alignment with the same topics in their discourses. The colors represent a clustering revealing these proximities between concepts used by the same actors around the topics (this clustering was obtained with a Louvain approach (Blondel et al., 2008)). Some concepts could participate to the formation of different topics. The size of the nodes is scaled in accordance with the betweenness centrality within the whole network.

Table 2
Most central topics.

Topic	Number of connections with other topics	Frequency (%) in the discourses
Physical resilience – Social hazard	718	12.38
Organization resilience – Economic hazard	622	10.46
Technology hazards	505	10.26
Natural hazards	399	8.13
Social hazards	474	8.49

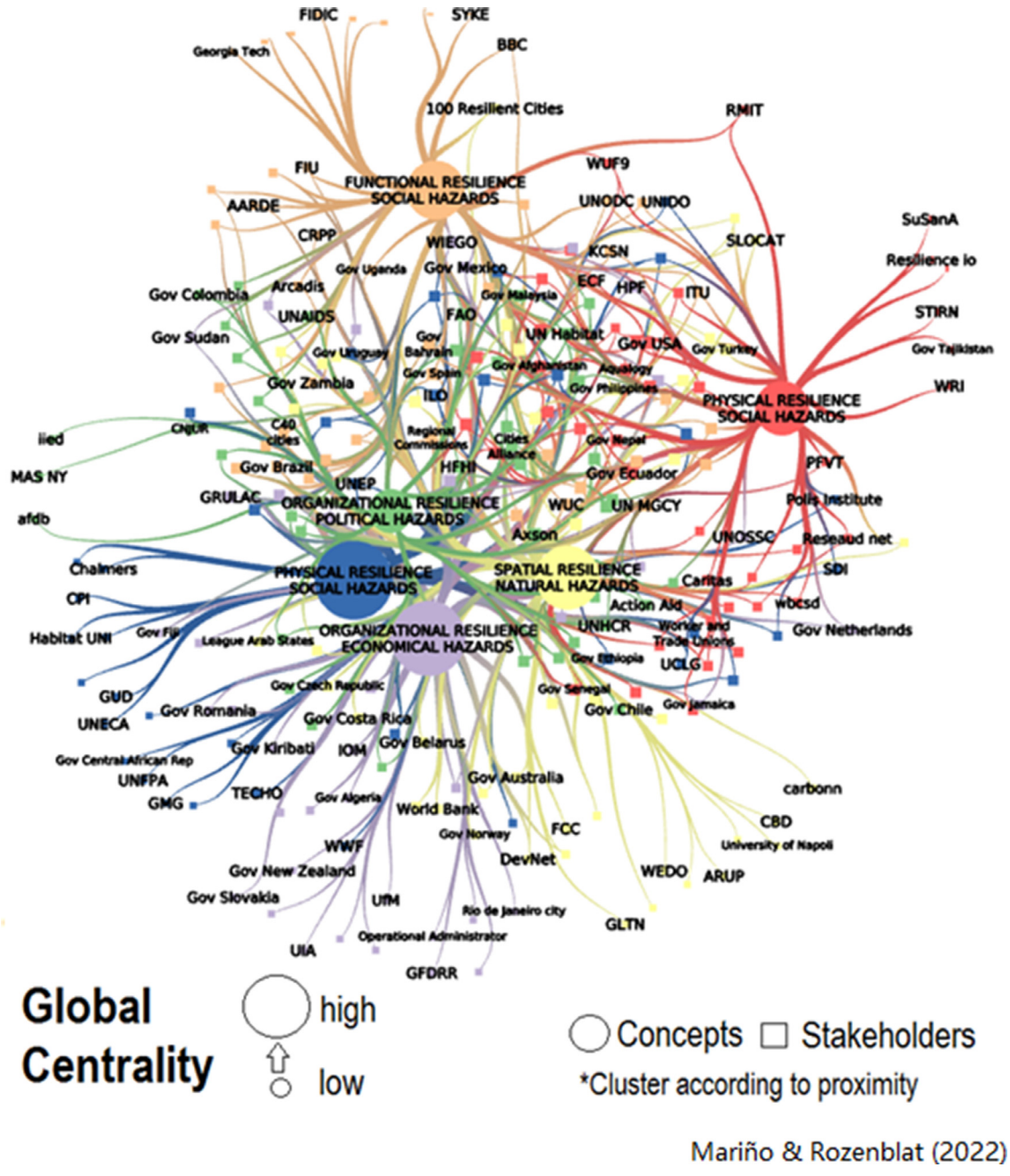


Fig. 4. Network of stakeholders and conceptual framework.

Actors situated in the center of the network participated equally to the constitution of all the topics. This is the case of the United Nations General Assembly, the UN-Habitat, the WUC and the Government of Ecuador, which participated in most of the events because they were organizers. At the contrary, other institutions supported some specific topics. For example, 100 Resilient cities (funded by Rockefeller foundation) oriented its participation on the topic of functional resilience & social hazard. We can explain that the 100 Resilient cities was interested on the actions linked to develop programs in social domains.

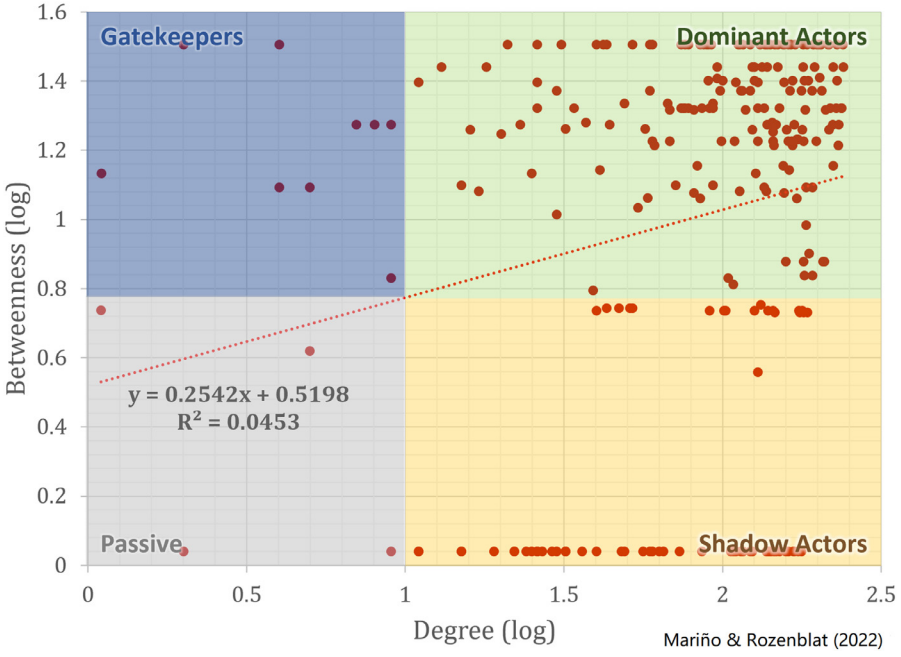


Fig. 5. Combination of global and local centrality of stakeholders' network.

5.3. *The role of actors in the network*

The combination of the degree centrality and betweenness centrality measures (Fig. 5) reveals the different roles of actors.

5.3.1. *The networked power of dominant actors*

When a stakeholder has a high degree over the mean value (500 links) and high betweenness over the mean value (15 ties), the actor is considered as a dominant actor in the "networked power" (green area in Fig. 5). The main dominant actors here are Ax:son, Cities Alliance, European Union, FAO, Global Taskforce and others. The Secretary General of UN presents the most central betweenness centrality, that places it in a high consensus position (yellow area in Fig. 5). It is followed by the Research and Academic Partner Constituent Group (RAPCG), which is part of General Assembly of Partners who represents the roundtable of universities and researchers. Also, the UN Regional Commissions concentrates a high level of betweenness, as well as International Red Cross (IFRC).

5.3.2. *The networking power of gatekeepers*

When a stakeholder presents a low level of centrality but a high number of shortest paths passing through him/her (purple area in Fig. 5), this actor becomes a point in the network who filter the information for the construction of ideologies, and we can consider this actor as a gatekeeper (Barzilai-Nahon, 2009). The stakeholders considered as gatekeepers are the Government of Malaysia, the Local Governments for Sustainability (ICLEI), the International Organization for Migration (IOM), the Organization for Economic Co-operation and Development (OECD), the Farmers' Forum of the International Fund for Agricultural Development (IFAD) agency of United Nations.

5.3.3. *The networking power of external gatekeepers*

In the making process of Habitat III agenda ("networking power"), there are key external stakeholders who were integrated in the making of the New Urban Agenda through the World Urban Campaign, where the General Assembly of Partners was constituted. Two principal external actors linked the private sector in gatekeeping positions:

- ISOCARP: The International Society of City and Regional Planners, which is leader of the General Assembly of Partners in the category of Professionals. This actor participated on behalf of the Habitat Professional Forum (HPF), in the Steering Committee of Subraya, Nairobi, New York, Prague and Quito.
- Practical Action: Representative of foundations and philanthropies group, it represented the WASH community, and it was associated to the Development Planning Unit of the University College London.

5.3.4. *The shadow actors' influence in the network power*

The stakeholders with a high number of connections to other stakeholders but not being in central places (with a low between centrality index) are considered as "shadow actors". These actors are situated in the yellow area of the Fig. 5. They include UNGA (United Nations General Assembly) who is also related to the development of the events; UN-Habitat and WUC who are organizers of the process. The Government of Ecuador became important with time because it was the host country of many events, that leaded to the last event for the agreement of the New Urban Agenda in Quito 2016. This country participated in all events and its representative was the president of the General Assembly of Member States.

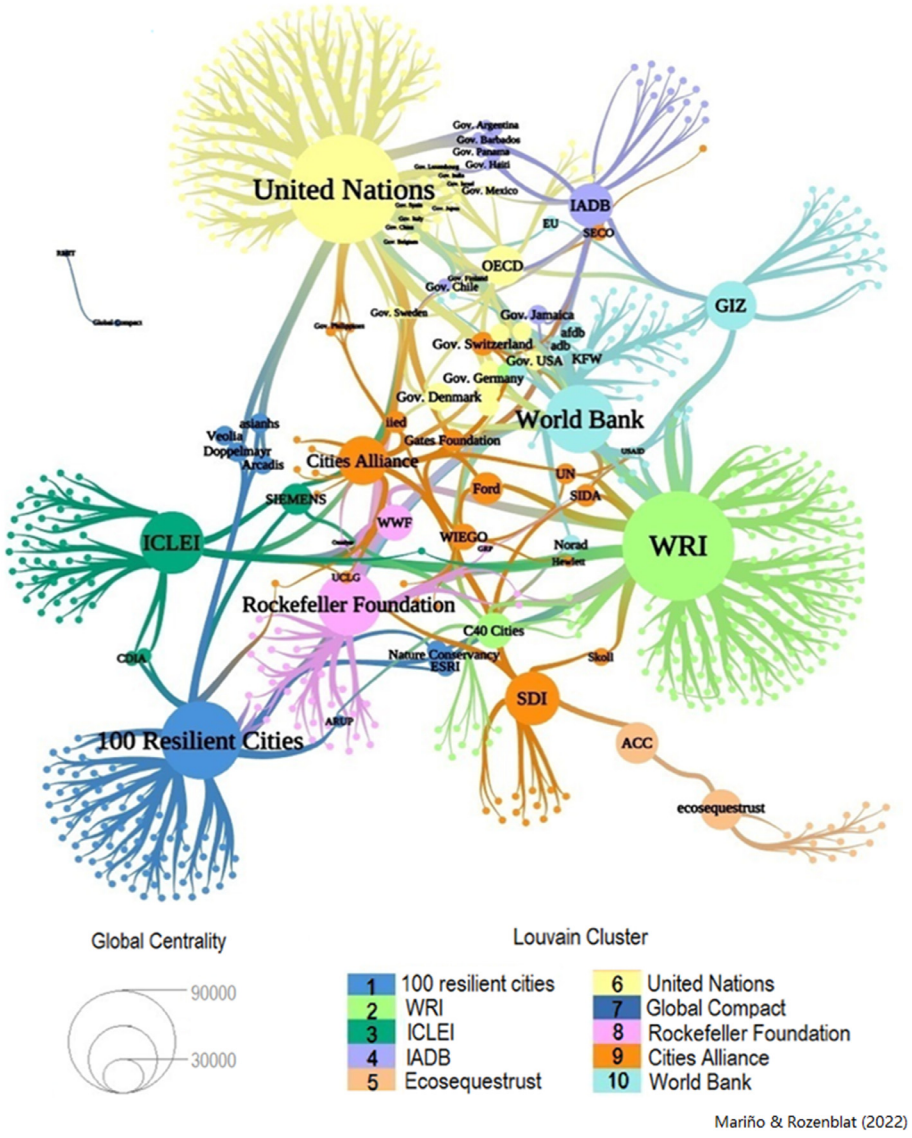
5.3.5. *The roles of power holders in the network making power*

The brokers in Habitat III network and those who sponsor the development of tools for the CRPP were important to switch networks of conceptual framework and to orient the actions and the programs. They are considered as programmers of the network because they can change the characteristics of the network ("network making power").

The network of funder stakeholders presents the relations between stakeholders engaged in the implementation of the CRPP program's tools and bringing a community behind them (Fig. 6).

The World Resource Institute (WRI), United Nations, 100 Resilient Cities and Rockefeller Foundation, captured the highest number of involved stakeholders and therefore had the highest involvement role in the network ("network making power"). In this network, funders were principal donors since the beginning of the programme, while the associated partners were investors and subsidiaries of the main donors. For example, 100 Resilient Cities was sponsored by the Rockefeller Foundation with the aims to build resilience and inclusive economies of urban areas worldwide. ICLEI was one of the major funders of the resilience platform. Its high level of centrality supported its ability to produce profits because the "Building Adaptive and Resilient Communities Tool" was

Fig. 6. Network of the most powerful stakeholders.



extended to many local stakeholders. Meanwhile, the key stakeholders with the role of sponsors (funder and associated) were linked to ICLEI and OECD, each concentrating more than 40 stakeholders. ISOCARP, IOM and IFAD were sponsors of the CRPP platform but with a lower level of associated actors.

6. Discussion

The networks of the Habitat III agenda and sponsors of CRPP Projects underline, with no surprise, United Nations, World Resource Institute (WRI), ICLEI and 100 Resilient Cities as the most central dominant stakeholders who applied a form of "network power". They define the standards for the social coordination between networked actors, and they settle protocols of communication. Furthermore, we identified shadow actors in the context of the "networked power", who dominated other actors' decisions based on the influence over funding in projects, such as Rockefeller Foundation, Cities Alliances, Gates Foundation, WEIGO (Women in Informal Employment: Globalizing and Organizing) and Ford, who are related with and dominate numerous foundations, social organizations and enterprises.

Some of them like the WRI, United Nations, 100 Resilient Cities, Rockefeller Foundation, or ICLEI also led strategic alliances as power holders ("network-making power"). Their domination capacities come obviously from their financial investment and support for the applied projects. They managed the process from the beginning to the end and they continued to develop events and transforming the actions linked to the Habitat III Agenda to concrete applications in local places in *100 Resilient cities* actions. This result completes the one of Leitner et al. (2018) who underlined the role of the Rockefeller foundation in the *100 Resilient cities*. From the conceptual elaboration to the actions, we demonstrate that not only the Rockefeller foundation, but all the foundations together with some international organizations like OECD, concentrated a large part of the power in the *100 Resilient cities* in a multipolar way, positioned as central or shadows actors.

However, with their top-down approach criticized by Leitner et al. (2018), the central and the shadows powerful actors were overwhelmed by the diversity and the complexity of the cities. Some parts of the planned program were changed because of the bad results and some laboratory cities were abandoned. In fact, we can explain these failures by the weak power given to the member states: they absorbed the proposals of experts, and their discourses were aligned to the policies and issues papers. During the first events, member states presented general ideas about their local needs that were weakly considered. Thus, during the whole process, the countries did not have any power that was taken by the stakeholders who forgot in a way the uneven needs of cities in different parts of the

world. This explains why many applications failed and this is what Kueckler (2015) criticized as the "reproduction of power", explaining in general the neocolonialism aspect of these coalitions in global political processes. Our analyze shows more precisely how much all the ember states (specifically from the South) were led by gatekeepers. These gatekeepers controlled the inclusion/exclusion of ideas and actors, empowering specific knowledge to ensure the formalization of knowledge hubs. We showed that they were mostly internal gatekeepers as the Government of Malaysia, ICLEI, IOM, OECD, and IFAD, but they were also external gatekeepers as the Practical Action and ISOCARP. Some of these mediators, continued to act in the area after the agenda publication. For example, OECD developed the hub of knowledge and the platform of resilience indicators. ICLEI created a support for the local governments: the *resilientcities2019 platform*.

An important aspect for the success of such political process design is the open negotiation process that ensures the participation of all participants/stakeholders (Eichhorn et al., 2021). The "networking power" we evaluated, addresses this aspect of the organization design. The network of stakeholders that we present in this paper, reveals the ideological structure that filtered and selected the needs of the countries. In this context, key stakeholders in the role of sponsors or power holders, created two influential groups (cluster in the analysis), one around ICLEI and the other one around OECD. Both associated about 40 stakeholders. A third cluster of influence was created around ISOCARP, IOM and IFAD who became sponsors of the CRPP platform, with the definition of actions, projects and funds, associating local actors and enterprises. By leading some parallel groups, these three groups of influence should share information to avoid the risk of fragmentation between groups of actors (Eichhorn et al., 2021).

The lack of results in the implementation of the Habitat III agenda exposes the power network's actors to fail in the mission of implementing their ideas. This role demands a stronger coordination between the central actors and the local governments and local actors with the support of training and investment. The applications through projects as *100 resilient cities* were implemented very quickly and without any guidance of the adaptation of the resilience vision to the uneven national frameworks of governance, to the inequal local conditions and capabilities. Every year, some meetings permitted to review the application of projects. But the actors mostly focused on local problems, the efforts not being addressed as global solutions. There is no more platform to coordinate actions, to implement solutions, and to stimulate horizontal relations between actors.

7. Conclusions

The paper elaborated a method permitting to enlighten the ways with which stakeholders built together the UN Habitat III Agenda between 2012 and 2016, including a specific approach of the "urban resilience" concept that became a key approach all over the world. The methodology proposed to underline how far the discourses are used as tools for introducing ideologies, and which ideas were supported by which stakeholders to validate the construction of the knowledge, and to ensure the acceptance of that knowledge as a truth.

The main results show that Urban Habitat III process for building the urban resilience concept was much more influenced by private external actors than it is commonly admitted, and different kinds of powers were distributed between internal and external actors. Despite the position in the conceptual building of gatekeepers does not ensure profits, their participation in the City Resilience Profiling Programme (CRPP) and their association in platforms as sponsors ensured the creation of projects, in which they better controlled the shape and benefits for their associates despite the lack of success for all these projects because of the weak power of member states. Thus, the process design should be reconsidered with a clearer perspective on the distribution of powers between the different actors, facilitating bottom-up and horizontal exchanges. We showed that the network approach applied on text analysis, provides a useful tool to evaluate the different kinds of positions and powers of stakeholders. A limit of this approach is the mandatory publication of statements of all the meetings. But we see that despite many corridor discussions were not recorded, the official discourses reflect their orientations. Also today, many tools permit to transcript discussions to texts and then to analyze them easily. This approach could be useful for future policy elaboration processes at every scales. Rather than to be a posteriori study, it could help to monitor the ongoing political process for such important planning projects that involve so many public and private actors. It would accompany the elaboration process, evaluating just-in-time the influences of different gatekeepers and ghost actors. Thus, it would improve the transparency of the democratic processes when it comes to build such important concepts or values.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Barzilai-Nahon, K., 2009. Gatekeeping: A critical review. Annu. Rev. Inform. Sci. Technol. 43 (1), 1–79.

Blei, D.M., 2012. Probabilistic topic models. Commun. ACM 55 (4), 77–84.

Blondel, V.D., Guillaume, J.-L., Lambiotte, R., Lefebvre, E., 2012. Fast unfolding of communities in large networks. J. Stat. Mech. Theory Exp. 2008 (10), P10008.

Burt, R.S., 2005. Brokerage and Closure: An Introduction to Social Capital. Oxford University Press, New York.

Camargo, B.V., Justo, A.M., 2016. IRAMUTEQ TUTORIAL. http://www.iramuteq.org/documentation/fichiers/IRaMuTeQ Tutorial translated to English_17.03.2016.pdf/ (accessed 17 March 2016)

Capra, F., 1996. The web of life: A new scientific understanding of living systems. Colonial Waterbirds 20, 347.

Castells, M., 2009. Communication Power. Communication Power. Oxford University Press, New York.

Chelleri, L., 2012. From the «Resilient City» to Urban Resilience. A review essay on understanding and integrating the resilience perspective for urban systems. Documents d'Anàlisi Geogràfica 58 (2), 287–306.

Contractor, N.S., Monge, P.R., Leonardi, P.M., 2011. Multidimensional networks and the dynamics of sociomateriality: Bringing technology inside the network. Int. J. Commun. 5 (1), 682–720.

Citiscope, 2016. What Is Habitat? http://citiscope.org/habitatIII/explainer/2016/09/what-habitat-iii/ (accessed 8 July 2017).

CRPP, 2012. City Resilience Profiling Programme (CRPP). https://www.cityresilience.org/CRPP/ (accessed 2012)

Diaz-Bone, R., Bührmann, A.D., Gutiérrez Rodríguez, E., Schneider, W., Kendall, G., Tirado, F., 2008. The field of foucaultian discourse analysis: Structures, developments and perspectives. Hist. Soc. Res. 33 (1), 7–28.

Dubé, J., Polèse, M., 2016. Resilience revisited: Assessing the impact of the 2007–09 recession on 83 Canadian regions with accompanying thoughts on an elusive concept. Reg. Stud. 50 (4), 615–628.

Eichhorn, S., Hans, M., Schön-Chanishvili, M., 2021. A participatory multi-stakeholder approach to implementing the Agenda 2030 for Sustainable Development: Theoretical basis and empirical findings. In: Stephan, H., Mahesh, J. (Eds.), A Nexus Approach for Sustainable Development. Springer, Rotterdam, pp. 239–256.

Escobar, A., 1985. Discourse and power in development: Michel Foucault and the relevance of his work to the Third World. Alternatives 10, 377–400.

Folke, C., Carpenter, S.R., Walker, B., Scheffer, M., Chapin, T., Rockström, J., 2010. Resilience thinking: Integrating resilience, adaptability and transformability. Ecol. Soc. 15 (4), 299–305.

Foucault, M., 1980. Power/Knowledge: Selected Interviews and Other Writings, 1972-1977. Pantheon Books, New York.

Foucault, M., 1982. The subject and power. Why study power? The question of the subject. Crit. Inq. 8 (4), 777–795.

Freeman, L.C., 1980. The gatekeeper, pair-dependency and structural centrality. Qual. Quant. 14 (4), 585–592.

Gallopín, G.C., 2006. Linkages between vulnerability, resilience, and adaptive capacity. Glob. Environ. Change 16 (3), 293–303.

Grün, B., Hornik, K., 2011. Topicmodels: An R package for fitting topic models. J. Stat. Softw. 40 (13), 1–30.

Guimerà, R., Mossa, S., Turtschi, A., Amaral, L.A.N., 2005. The worldwide air transportation network: Anomalous centrality, community structure, and cities' global roles. Proc. Natl. Acad. Sci. U.S.A. 102 (22), 7794–7799.

Habitat III., 2015a. Habitat III General Assembly of Partners: Constitution and By-Laws. http://www.disabilityinclusivedevelopment.org/system/files/general-assembly-partners-constitution.pdf (accessed 2016).

Habitat, III., 2015b. Towards a new urban agenda New York. http://www.wbcsdservers.org/web/wbcsdfiles/files/Ana.

Hajer, M., 1993. Discourse coalitions and the institutionalization of practice: The case of acid rain in Britain. The Argumentative Turn in Policy Analysis and Planning. Duke University Press Books, Durham, p. 327.
Hajer, M., 2002. Discourse analysis and the study of policy making. Eur. Polit. Sci. 2 (1), 61–65.
Hewitt, S., 2009. Discourse Analysis and Public Policy Research. Centre for Rural Economy Discussion Paper Series 24. http://www.ncl.ac.uk/media/wwwnclacuk/centreforruraleconomy/files/discussion-paper-24.pdf/ (accessed 2009).
Holling, C.S., 1973. Resilience and stability of ecological systems. Annu. Rev. Ecol. Syst. 4 (1), 1–23.
Knispelis, A., 2016. LDA topic models. Denmark: Youtube. https://www.youtube.com/watch?v=3mHy4OSyRf0/ (accessed 2016)
Kuecker, G.D., 2015. Urban Resilience Consultancy Network. International Geography Union Urban Geography Commission Annual Meeting. International Geography Union.
Leifeld, P., 2010. Political Discourse Networks. The Missing Link in the Study of Policy-Oriented Discourse. https://ecpr.eu/Filestore/PaperProposal/d9d2e2b4-306f-4bed-a1a9-8be194ff7dbf.pdf/ (accessed 2010)
Leifeld, P., 2017. Discourse Network Analyzer. https://github.com/leifeld/dna/wiki/Overview:-What-is-DNA-good-for%3F}what-kinds-of-networks-can-dna-export/ (accessed 6 April 2017)
Leifeld, P., Haunss, S., 2012. Political discourse networks and the conflict over software patents in Europe. Eur. J. Polit. Res. 51 (3), 382–409.
Leitner, H., Sheppard, E., Webber, S., Colven, E., 2018. Globalizing urban resilience. Urban Geogr. 39 (8), 1276–1284.
Levin, S.A., 1998. Ecosystems and the biosphere as complex adaptive systems. Ecosystems 1 (5), 431–436. Retrieved from http://www.esf.edu/cue/documents/Levin_Ecosys-Biosphere-ComplexAdaptSys_1998.pdf .
Manning, C.D., Raghavan, P., Schütze, H., 2009. An Introduction to Information Retrieval. Cambridge University Press, Cambridge.
Marchand, P., Ratinaud, P., 2012. L'analyse de similitude appliquée aux corpus textuels : les primaires socialistes pour l'élection présidentielle française (septembre-octobre 2011). Actes Des 11èmes Journées Internationales d'Analyse Des Données Textuelles (JADT). http://lexicometrica.univ-paris3.fr/jadt/jadt2012/Communications/Marchand/ (accessed 2012).
Mclaughlin, E., 2013. City Resilience Profiling Programme (CRPP) Marsh in partnership with UN-Habitat. Geneve. http://www.preventionweb.net/files/globalplatform/519b818e230f9CRPP_marsh_Presentation_Geneva_May_2013_final.pdf/ (accessed 2013)
Meerow, S, Newell, J.P., 2015. Resilience and complexity: A bibliometric review and prospects for industrial ecology. J. Ind. Ecol. 19 (2), 236–251.
Meerow, S., Newell, J.P., Stults, M., 2016. Landscape and urban planning defining urban resilience: A review. Landsc. Urban Plan. 147, 38–49.
Mehmood, A., 2016. Of resilient places: Planning for urban resilience. Eur. Plan. Stud. 24 (2), 407–419.
Menaka, S., Radha, N., 2013. Text classification using keyword extraction technique. Int. J. Adv. Res. Comput. Sci. Softw. Eng. 3 (12), 2277.
Mitincu, C.-G., iojă, I.-C., Hossu, C.-A., Niță, M.-R., Niță, A., 2021. Collaborative aspects of nature-based solutions: Strategies, plans, programs, policies, projects. EGU21. https://doi.org/10.5194/EGUSPHERE-EGU21-9923/ (accessed April 2021)
Morin, A., Rennes, U.de., 2006. Intensive use of factorial correspondence analysis for text mining: application with statistical education publications. Stat. Educ. Res. J. (1990) 1–6.
Neto Henriques, C., Dragovic, S., Auer, C., Gomes, I., 2020. The Territorial Agenda 2030: Towards a common language? A review of a conceptual framework. Europa XXI 38, 157–174.
Norris, F.H., Stevens, S.P., Pfefferbaum, B., Wyche, K.F., Pfefferbaum, R.L., 2008. Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. Am. J. Commun. Psychol. 41 (1–2), 127–150.
Pelling, M., 2011. Adaptation to Climate Change from resilience to transformation. Adaptation to Climate Change from Resilience to Transformation. Routledge, London.
Ponweiser, M., 2012. Latent Dirichlet Allocation in R. http://epub.wu.ac.at/3558/1/main.pdf/ (accessed May 2012)
Revi, A., 2017. Afterwards: Habitat III and the Sustainable Development Goals. 10.1177/2455747116682899/ (accessed 13 February 2017)
Rogov, M., Rozenblat, C., 2018. Urban resilience discourse analysis : Towards a multi-level approach to cites. Sustainability 10 (4431).
Rozenblat, C., Melancon, G., 2013. Methods for multilevel analysis and visualization of geographical networks. In: Rozenblat, C., Melancon, G. (Eds.), Methods Series. Springer, London.
Taylor, F.E., Malamud, B.D., Millington, J.D.A., 2018. Assessing multi-hazard risk to urban infrastructure using low-cost GIS techniques. Urban Africa Risk Knowledge Briefing (October 2018).
Teil, H., 1975. Correspondence factor analysis: An outline of its method. J. Int. Assoc. Math. Geol. 7 (1), 3–12.
UN-Habitat, 2012a. Volume 4: The City Resilience Profiling Programme. CRPP (accessed 8 July 2017).
UN-Habitat, 2012b. World Urban Campaign. https://unhabitat.org/world-urban-campaign/ (accessed 8 July 2017).
UN-Habitat, 2015. Habitat III Issue Paper 15 - Urban Resilience. Habitat III Issue Papers. New York. https://unhabitat.org/wp-content/uploads/2015/04/Habitat-III-Issue-Paper-15_Urban-Resilience-2.0.pdf/ (accessed 2015).
Vijayarani, S., Ilamathi, J., Nithya, M., 2015. Preprocessing techniques for text mining - An overview. Int. J. Comput. Sci. Commun. Netw. 5 (1), 7–16.
Walker, B., Salt, D., 2012. Resilience Practice. Building Capacity to Absorb Disturbance and Maintain Function. Island PressIsland Press/Center for Resource Economics, London.
Wang, Y., Chen, X., Gong, J., Yan, Y., 2016. Relationships between stress, negative emotions, resilience, and smoking: Testing a moderated mediation model. Subst. Use Misuse 51 (4), 427–438.
Wasserman, S., Faust, K., 1994. Social network analysis: Methods and applications. In: Granovetter, M. (Ed.), Structural Analysis in the Social Sciences, Series Number 8. Cambridge University Press, Cambridge.
UN-Habitat, 2016. Our donors. https://unhabitat.org/our-donors/ (accessed 8 July 2017)