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Mind the gap: revitalizing action planning through social networks in Yogyakarta

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ABSTRACT

Against the backdrop of increasingly complex urban systems, grassroot communities in cities are rolling out small-scale initiatives as a way to address contemporary urban problems. However, the initiatives are not always in line with the formal planning conducted by the government. This study aims to investigate the interaction between the government and grassroots actors under the context of self-governed grassroots initiatives by using the 'Marginal School Community' social network structure in Yogyakarta as an example case. Using social network analysis with 77 actors entailed in the community's activities, this study shows an alternative interaction between the government and the grassroots within an action planning process. The paper reflects on these examples and suggests an alternative way that cities may be planned and governed in the future, adopting a more grassroots-based planning approach based on collaboration, negotiation and mutuality.

1. Introduction

In almost all aspects of urban planning across the globe, governments have a responsibility to initiate legislation and policy or shape every decision, within pre-determined processes. As the responsible authority within nations, the government is charged with managing and controlling places by steering enabling mechanisms through various statutes, policies, and regulations at different scales (Karré, van der Steen, and van Twist 2011; Tewdwr-Jones 2002). In some nations, these planning arrangements are decentralized or occur within federal constitutional systems (e.g. Germany, Indonesia, and Colombia); in others, planning is split governmentally and institutionally between the national government and sub-national government (e.g. the Netherlands and the United Kingdom).

In previous decades, particularly during the twentieth century, such approaches to formal planning represented an incremental and systemized approach to dealing with the problems facing places (Hall and Tewdwr-Jones 2020). But, during the first two decades of the twenty-first century, we have started to see the cumulative impact of economic, social, environmental, and technological change outpacing the ability of planning responses to set visions, analyze options, implement policies, and address the consequences of change (Mitleton-Kelly 2015). As we enter a period where nations are attempting to find new ways to operationalize the UN's Sustainable Development

Goals (United Nations 2015), through more creative approaches, the relationships between planning and communities, and between representative government and participatory processes, will come to the fore more prominently (UN Habitat 2022).

Designing a quick and responsive planning process enshrined in legal frameworks and subject to governmental review is an ongoing challenge for countries (Mussa 2016; Nowak, Cotella, and Śleszyński 2021). Urban planning is also set within highly politicized decision-making where different options take on their own political significance and where action or inaction may affect place futures in uneven ways (Auerbach 2012; Crane, Weber, and Thompson 2012). These features are part of the ongoing challenge of utilizing formal planning processes within democratic representative government. They are not so problematic as to warrant nations deciding not to pursue any form of planning, but they are ever-present interruptions in the process of responsive government. These interruptions can cause delay and frustration as much for agencies of government as developers; but they can also cause uncertainty for society and for communities eager to bring about more equal and more just places (Fainstein 2010).

Ensuring that planning operates within a democratic and accountable government system, by permitting politicians to be questioned and allowing consultation mechanisms, is also a vital element of planning even if, they too, cause impediments (Alexander 1965). Since consultation has been introduced as a formal part of planning, so too have expectations grown from citizens and communities for a more prominent say in governmental decision-making (Lane 2005). Over the decades, we have learned that it is not only important to give communities a voice in change, but the quality of that opportunity, its breadth, meaning and visibility (Innes and Booher 2004). If anything, these attributes to transparent elements of democratic government are critical for those who must live with the consequences of planning decisions, and they are key to how we judge the legitimacy of those processes.

As societies become more advanced and cities become more complex, governments often seem to be overwhelmed by the task of managing and controlling all aspects of urban change. On occasion, it can be the approaches government use that are not fit for purpose, and that may include prevailing forms of planning designed in a different era for different circumstances (Chinis, Pozoukidou, and Istoriou 2021; Nunbogu et al. 2018). Consequently, some critical newer problems are not addressed, take a longer time for the government to understand, analyze, and provide solutions to them, or are encumbered by fraught political debate. This gap between the expected role of planning by government and the practice of managing the city in a fast-paced and politically-fraught world is one that has been identified in previous urban planning debates (see, for example, Raco, Durrant, and Livingstone [2018]). The vacuum does not remain for long, since the requirement to do something tends to override any notion that actors within a place are prepared to wait intently until government is able or prepared to act. Among the various accounts of what-we-may-refer-to-as interim action have been questions about who should perform such activities (Lakitan 2012), what methods and tools are used (Rauws 2016), how legitimate they are (Fressoli et al. 2014; Laforge, Anderson, and McLachlan 2017; Ng et al. 2019), and whether they are oppositional or activist in nature (Sager 2018).

In this paper, we examine interim action in urban problems undertaken by a group of networked citizens, 'grassroots actors', who respond by dealing with unaddressed (or not yet addressed) urban issues. In the planning literature, this phenomenon has been labelled 'self-organisation' within the context of 'grassroots urbanism' (see, for example, Moroni, Rauws, and Cozzolino [2020] and Sandler [2020]). The self-organization generates a 'new world' of planning practice based on social networks whereby, in increasing instances, planning practice is not fully determined and conducted by government only. Citizens can take part and conduct spontaneous collective interventions to transform their own urban areas.

This self-organization world seems detached from formal planning conducted by the government, which may result in ad hoc, unmonitored, unmeasured and undetected actions in the city (Beard 2002). In some places, the self-organized and the formal occur simultaneously. In others,

the two worlds, both intent on addressing urban transformation, seem unable or unwilling to interact with each other. There is a lack of discussion in the literature about the interaction between the government and grassroots in this context. There is a need to rethink the relationship between the self-organized and the formal, between the socially networked grassroots movements and the formalized processes of government. At a time of immense urban upheaval and uncertainty, there is also a need to create a better understanding of how complex urban issues are being addressed practically, and to identify what emergent planning forms exist.

This paper investigates the gap between the government and grassroots actors under the context of self-governed grassroots initiatives using the 'Marginal School Community' network structure in Yogyakarta Urban Area, Indonesia, as a case study. Specifically, this study tries to reveal the lack of government presence in supporting self-organized initiatives taken by grassroots actors to fulfil gaps in public service provisions, where problems emerge that are either not on the government's radar or because they lack the know-how to handle these self-organized initiatives. Two questions are raised: (1) How is the social network structured within the Marginal School Community, and to what extent is the government present in the network? and (2) To what extent might the social network influence and shape government-grassroots interaction to plug the public service gap? It achieves this by adopting Social Network Analysis as a methodological frame.

The following section considers two interrelated conceptual issues: the relationship between urban planning intent and action, and the role of citizens within action planning; and a review of self-organization and grassroots movements. The second half of the paper considers the case of the Marginal School Community. Following a discussion of the principal findings, the paper concludes by returning to more conceptual issues relating to self-organized grassroots movements and how formal structures, such as government, could potentially become more involved with the movement through action planning frameworks.

2. Between urban planning intent and action

Since the 1960s, urban practitioners across the globe have made greater demands for more participatory styles of planning whereby the government, as the decision-maker, is answerable to the electorate and is expected to communicate frequently with citizens as affected actors in the planning process. However, the participatory aspects in planning can take on different forms, most readily represented in Arnstein's ladder of participation (Arnstein 1969). Essentially, the ladder shows the degree of interaction between the government and the citizens, categorized as non-participation, tokenism, and citizen power. Focusing on citizen power, Arnstein (1969) argued that this could be achieved by three modes: building partnership between the government and the citizens; delegating several decisions to the citizens; and enabling citizens to have full control and resources to plan. In the same year, Friedmann (1969) argued that the interaction between government and citizens in the planning area could not only be conducted within the planning process, as Arnstein (1969) proposed, but also in the downstream, implementation process of urban transformation. From this, he coined the term, societal action, which he called the essential role of action planning that ultimately drives both government and citizens to do something quickly while also being committed to long-term planning (Friedmann 1969, 1973). His argument was that interaction between government and citizens occurs in, and can manifest itself through, processes of policy planning and action-implementation on the ground.

At the implementation stage, there are various types of societal actions that are separated from formal planning conducted by the government. Groups of citizens may want to initiate and implement their own planning programmes to improve areas of the city without any formal planning programme (Chinis, Pozoukidou, and Istoriou 2021). The reasons for this action may be time delays or policy failures (Putnam 2021; Ross, Mitchell, and May 2012; Sandler 2020). Rauws (2016) uses the term 'self-governance' to describe these kinds of societal actions whereby citizens independently and collectively devise an initiative for common goals. In the context of south-east Asian

cities, Beard (2002) identified this form of societal action as a common practice for citizens to socially transform their living conditions. It is in line with findings from Rahmawati (2015) and Hidayanti (2013), which reveal that self-organizations help local inhabitants to fulfil their desired needs and the quality of the environment without necessarily passing through a formal government planning process. Unfortunately, the initiatives are often seen by governments as nothing more than a representation of high social bonding in the area and place independence.

As a self-initiated action without any interaction from the government, it seems that interaction between them is separated into two different worlds that share similar intentions to manage urban change and transform and improve the city. Hamdi (2004) bridges these parallel worlds by suggesting the need for an action planning framework that tries to connect both, through inter-action and distributing tasks formally to achieve each set of goals (see Figure 1).

In the action planning framework, the world of practical work (community grassroots) and strategic work (government) is forced to interact with planning implementation and is mediated by 'development practitioners' (e.g. planners, NGOs, consultants). In the framework, the strategic planning model does not start in a traditional way through survey and analysis, but rather begins with the plan as an overarching frame that is developed and implemented through a series of evaluation methods that require further rounds of data collection and analysis. The key difference is that this data requirement is transferred to and undertaken by citizens (the 'field worker', usually the initiator/community leader) rather than by professional government planners. The purpose, apart from devolving responsibility for planning to communities directly and thereby sharing power, is to identify problems and opportunities in the field directly, to ensure that more targeted,
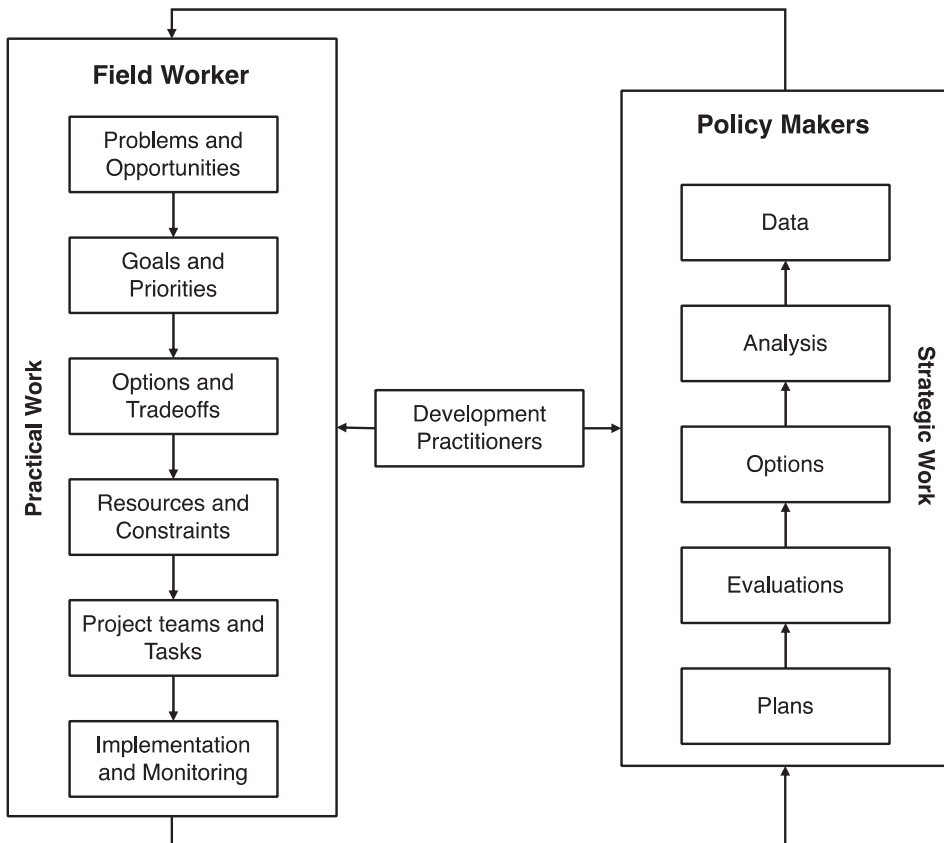

Figure 1. Action planning framework. Source: Adapted from Hamdi (2004).

relevant, and potentially impactful improvements are identified. This approach then helps set common goals and prioritize actions.

However, devolving planning responsibility to citizens directly is not necessarily a straightforward task. In conducting a set of actions to achieve the goals, citizens are faced with several options, trade-offs, resource mobilization, and constraints. As collective social action, they need to recruit project teams and distribute tasks, work together as a team, and monitor implementation. Outcomes of these implementation and monitoring procedures then act as feedback for the policymakers via professional planners, or development practitioners, to set the plans and the programme stages in an ongoing cyclical process.

Within the process, there are various government-grassroots interactions that emerge (see Table 1). Based on the type of interaction, even where the grassroots actors implement their own initiatives, there are several ways that the government may still dominate the process (by containing or co-opting the initiative). Sometimes, the grassroots may dominate the process by contesting the government. Other types of interaction provide a level playing field for a more equitable distribution of power based on collaboration, negotiation, and even friendship or mutuality.

These contentions are not just about finding ways to enhance public participation and citizen engagement with government, important as that may be (Piperagkas, Angarita, and Issarny 2020). This is a much more fundamental call through action planning to harness the knowledge, skills, and talents of citizen and government for mutual benefit. To stand any chance of operationalizing action planning, it requires an in-depth examination of the form and nature of any interaction, to understand the social networks prevalent, and to identify how different actors engage with each other through their relational patterns (Holman 2008). If government-grassroots interaction is dependent on the ability of people to engage with each other, social network analysis could offer a useful method to identify interaction type, strength, and key individuals (Zedan and Miller 2017). It is the social networks within the grassroots movement, and how these shape government interaction within the networks, that form the focus of this paper.

3. Self-organization and the relationship to formal planning in Yogyakarta

The growth of urbanization in neoliberal settings in Global South nations can create 'winners and losers', resulting in development and progress but also inequality and less social justice (Miraftab 2009). From a socio-economic perspective, people who do not possess the right skills and are unable to gain a stable job when coming to the city are likely to struggle to fulfil their basic needs, and it is these individuals and families who are the 'losers' in urbanization. The first basic need that they cannot afford is a house which then precipitates further informal settlements with inadequate critical facilities and associated infrastructures (Rai 2017). It then affects the environmental quality of the city through the lack of infrastructure, for instance, to remove domestic waste and drain

Table 1. Government-grassroots interaction type.

No	Type of interaction	Description	Dominance	Source
1	Containing	Some restrictions to grassroots initiatives	Government	Laforge, Anderson, and McLachlan (2017)
2	Co-opting	Dilutions to grassroots power	Government	
3	Contesting	Challenging the government	Grassroots	
4	Collaborating	Partnership between government and grassroots	Equal	
5	Negotiating	Building consensus and agreements	Equal	Hoppe et al. (2015); Muok and Kingiri (2015)
6	Mutuality	Supporting each other	Equal	Druijff and Kaika (2021); Ioannou, Morán, and Certomà (2015)

Source: Adapted from Druijff and Kaika (2021); Laforge, Anderson, and McLachlan 2017; Hoppe et al. (2015); Ioannou, Morán, and Certomà (2015); Muok and Kingiri (2015).

wastewater (Uttara, Bhuvandas, and Vallabhbhai 2012). Aside from other basic needs, such as food and clothes, they also need to provide children with education. However, in less developed countries, not all children can get access to a formal educational service. The 'losers' face several dilemmas in sending children to schools, such as cost, household affordability, civil registration identification, and demand for the children to work – rather than study – to increase family income (Damon et al. 2016). It illustrates the domino effect that can generate a series of wicked problems (Rittel and Webber 1973) and overlapping complexities in the urban setting (Dixon and Tewdwr-Jones 2021) that governments might not be able to address quickly.

These trends are especially prevalent in nations such as Indonesia, which has a total population of over 270 million, and is classified as a lower-middle income country where gross national income (GNI) per capita is just around $4000 (World Bank 2022a). At the same time, Indonesia is facing rapid urbanization with 57% of its population now living in urban areas (World Bank 2022b). Unfortunately, Indonesian cities are not prepared to receive rapid growth and, consequently, urbanization generates problems such as poverty and informal settlements (Alzamil 2018). Not all the people who migrate to cities receive a better standard of living, causing them to settle in undesirable areas within the city, such as riverbanks and canals (Asian Development Bank 2022). In 2021, there were more than 12 million (7.89%) of the urban population living below the poverty line and around 6% of these lived in informal settlements (Asian Development Bank 2022; Indonesian Central Bureau of Statistics 2021). The urban informal settlement area is increasing in size over time with about 114.5 thousand hectares of urban area categorized as informal in 2021 (Indonesian Ministry of Public Works 2021).

Against this backdrop, Indonesian city governments are facing significant challenges in handling urban issues generated by intensifying urbanization. However, as we noted earlier, the complex issues often result in city governments performing at a slower rather than urgent pace of intervention. In Indonesia, a planning document is typically developed and legalized over a 12–24 month period and, during this process, cities continue to change while the plan is frozen at the point in time when the fieldwork data was captured.

As a result, due to the urgency of the urbanization situation, and because communities are impatient for change, many grassroots initiatives have started to emerge to handle particular urban issues where it is considered that city government is not managing the escalating problems. What this means practically is the initiation of self-governed communities trying to provide basic services, such as waste collection and educational services, to marginalized people in the informal settlements.

In one of the Indonesian urban areas, Yogyakarta, there is an informal settlement that is home to informal waste collectors and where most children do not attend school because parents prefer them working to contribute to household income. This child labour usually takes the form of waste picking, but they may also be on the streets as buskers and beggars. This is an agglomeration area comprising three administrative areas: Yogyakarta City, Sleman Regency, and Bantul Regency. The urban area has a unique demographic profile with more than 1.2 million people residing on a high density land located in the centre of Java Island (see Figure 2). Administratively, the informal settlement is located in Sleman Regency, in which the government does not record conditions officially because most informal settlers do not possess civil registration identification, and they inhabit the riverside land illegally. The government therefore ignores them and does not develop policies or programmes to address their plight. Even children's education within the informal waste picker settlement is not a government priority when other critical issues, such as large infrastructure development, transport growth, and the COVID-19 pandemic, have all vied for political attention. These facts make it a unique case, where a public service gap exists between the government and the grassroots actors.

In place of government, the conditions of the waste picker settlement have been handled by a grassroots organization called 'Komunitas Sekolah Marjinal' (in English: 'Marginal School Community' (MSC)), which was initiated by local grassroots activists in October 2019. The initiators are

Figure 2. Location of Yogyakarta urban area and the Marginal School Community Initiative (MSC).

four final-year undergraduate students who initially wanted to create a travel business and use some of the profits to help children who cannot attend school. However, they decided to create this initiative in parallel to their business plans. They raised funds by discussing the proposal with their networks and relations; this finally led to the building of the school in just two weeks. Instead of lobbying the government for action, the community decided to help children to study and gain formal education qualifications, ranging from elementary to high school-age students. Their initiative expanded rapidly to social, environmental, and health-related activities within the settlement. Some of the impacts achieved were to avert the children from informal waste picking, create hygiene facilities in the area, and provide health monitoring. To roll out the initiative, they socially networked internally with the local inhabitants (the informal settlers): parents, children, and volunteers. The main challenges for the community during the process were to initially approach the local inhabitants and prove that they wanted to do something for the inhabitants' benefit, which took some time. Another obstacle was getting permission from parents to let their children join the school. This is because some parents preferred for their children to help them work at home domestically instead of studying at school. The community also networked with external organizations to help them to achieve results, such as NGOs, universities/colleges, university student organizations, government institutions, and other local communities.

The remainder of this paper tells the story of how this grassroots initiative developed through key actors and sets out the structure of the grassroots initiative of MSC in Yogyakarta. Using it as an example case, the research project set about identifying how it operates through an analysis of the complex community social networks that exist.

4. The research project

The study deployed a questionnaire to examine the range and extent of social networks that exist within the settlements to identify whether this had a bearing on how quickly and successfully the grassroots initiatives were established. It gathered the following information: (1) respondent profiles, (2) interaction with the stated persons (interaction frequency, medium, sentiment, and motivation to interact), and (3) respondents' views on the outcomes of the MSC activities (physical and non-physical outcomes). The data collection was conducted from October to December 2021 in 'Kampung Kledokan', Yogyakarta Urban Area (the area of informal waste picker settlements). The

questionnaire was distributed by meeting each of the respondents in person, and the surveyors filled the questionnaire on behalf of the respondents based on the respondents' answers. This was to anticipate any misunderstandings on the questions and get the respondents to answer the questions properly. Additionally, there was concern that students, parents, and informal settlers might not be familiar with the questionnaire format or how to complete it. The data collection activity was assisted by five members of MSC's committee and other volunteer members who acted as gate-keepers and enablers for research access. The MSC's committee members and volunteers were selected as data collection assistants because they possessed the trust of local inhabitants and students. Apart from that, they only read questions from the questionnaire and transcribed the answers. This was intended to identify social networks through casual interaction with familiar persons to collect the data.

The selection of respondents was based on actor categories that are connected to the MSC's activities: (1) Elementary school-age students, (2) Middle school-age students, (3) Parents, (4) Informal settlers (excluding parents of students), (5) Marginal School Community's committee members, (6) Marginal School Community's volunteers, (7) Higher education, (8) Other organizations (Community/NGO), and (9) Government institution. Each group was purposefully selected based on availability and easiness to reach out (Battaglia 2008) (for the sample size, see Table 2). We selected the students who joined the MSC for at least one year and were consistent in following all activities in MSC. Based on the selection of the students, we choose their parents to take part in this study. In this study, one of parents has a child who is of elementary school-age and a child who is of middle school-age. The informal settlers were selected by excluding the selected parents of students and children under 5 years old. We then randomly selected the informal settlers on site during the data collection based on their availability and willingness to participate. The MSC committee and volunteers were selected randomly based on their availability and willingness to participate. For the government institutions, higher education, and other organizations, the inclusion criteria were that they: (1) had or have an interaction with the MSC, either the MSC committee who approached them first or vice versa. (2) had or have a formal and longer partnership (preferably), meaning that they have a formal letter of partnership with a specific period of time. Based on the inclusion criteria, the government institutions were selected based on the experience of the MSC committee whenever they had approached these institutions in recent years, such as to advocate the civil registration of the informal settlement inhabitants, attain the birth certificates of the students, or to request legalizing the settlement. But none of these actions were responded to by the institutions, probably because the government views MSC as an informal organization and the inhabitants have illegally occupied the land. The higher education and other organizations were selected based on their record in conducting a specific project with the MSC for at least 1 month in 2021. Initially, the total sample size was set to 53 respondents but, in the end, there were 34 respondents participating; 19 either decided not to be questioned or did not respond to the invitation, several follow ups were made to government institutions but there were no responses.

Table 2. Population and sample size of each actor category.

No	Actor category	Population	Sample (Plan)	Sample (Execution)	Code
1	Elementary school-age student	6	3	1	A
2	Middle school-age student	3	1	1	B
3	Parents	13	6	4	C
4	Informal settlers (excluding parents of students)	28	13	9	D
5	Marginal School Community's committee member	44	6	6	P
6	Marginal School Community's volunteer	24	10	8	R
7	Higher education	11	5	3	E
8	Other organizations (Community/NGO)	4	2	2	F
9	Government institution	11	5	0	G
Total		141	53	34	

Each group was coded with a specific alphabet to aggregate the respondent's identity. Each respondent then had a unique code number allocated (for instance: A1 refers to respondent number one who came from group A, which is an elementary school-age student). This code system was used to analyze the network to identify the key persons and actor categories within the network. During the data processing, the respondents identified 43 persons they interacted with during the activities of MSC from 2020 to 2021. Therefore, 77 actors, including the respondents, are analyzed within the MSC's social network.

The data gathered from each respondent was then analyzed using social network analysis (SNA), commonly used to explore structures of relations among actors within a certain social context (Giuffre 2013). The data was processed, analyzed, and visualized using R Studio, which takes some open-source codes from several forums, such as Github and Stackoverflow, following steps undertaken by Ognyanova (2016).

From the diagram developed as part of the SNA, four aspects were analyzed to achieve the objective of the study, namely: degree centrality; betweenness centrality; closeness centrality; and interaction rate between actors; (for the graphical representation of each network, see Figure 3:

a. Degree centrality refers to the number of ties that each node has (Borgatti, Everett, and Johnson 2013). For instance, persons A, B, C, and D have a connection to person Y. Hence, the degree value of person Y is 4. The higher the degree of centrality of a node, the higher its importance to influence other nodes.
b. Betweenness centrality refers to the frequency of a node being passed between the shortest path of two different nodes (Borgatti, Everett, and Johnson 2013). For instance, in order for person A to reach out to person Y, they need to communicate with person C first as does person B
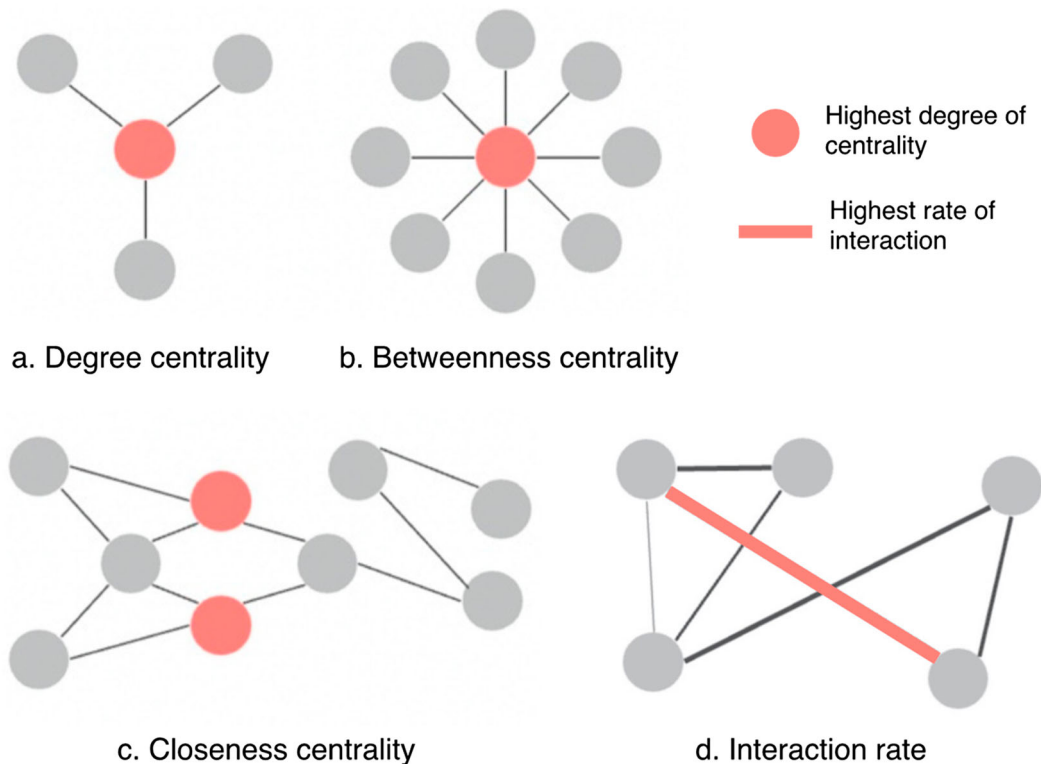

Figure 3. Graphical representation of network centrality and interaction rate. Source: Adapted from Tanglay et al. (2023).

because person A and B has no connection with person Y, whereas person C has a connection with person Y while also has a relationship with person A and B. Therefore, the betweenness value of person C is 2. The higher the betweenness centrality of a node, the higher its importance to connect one node to another node.

c. Closeness centrality refers to the shortest path distance of one node to another node (Cunningham et al. 2017). The lower the closeness centrality of a node, the higher the indication of community solidity. However, it can be normalized to reverse the order of the value. Hence the higher the value, the closer the node. In this study, the closeness centrality is normalized to make a more straightforward interpretation.

d. The interaction rate refers to the frequency rate of interaction between nodes (Adams, Santos, and Williams 2020). In this study, it is based on the number of interactions via any kind of medium (i.e. face-to-face, WhatsApp, SMS, and phone) that each actor performed in a year.

5. Research findings

5.1. The structure of social networks of marginal school community

Based on the analysis of the data, the network of actors within the MSC can be visualized based on their actor category (see Figure 4). It shows that the MSC's committee and volunteer members spread across the network and have the most ties with other actors in different actor categories because MSC acts as the grassroots organization that initiates the projects. Therefore, they must connect with other actors in all actor categories to execute their activities within the informal settlement.

The network was then further analyzed to reveal the key actors, connectors, solidity, and interaction among actors within the MSC. First, the key actors are shown by analyzing the degree of
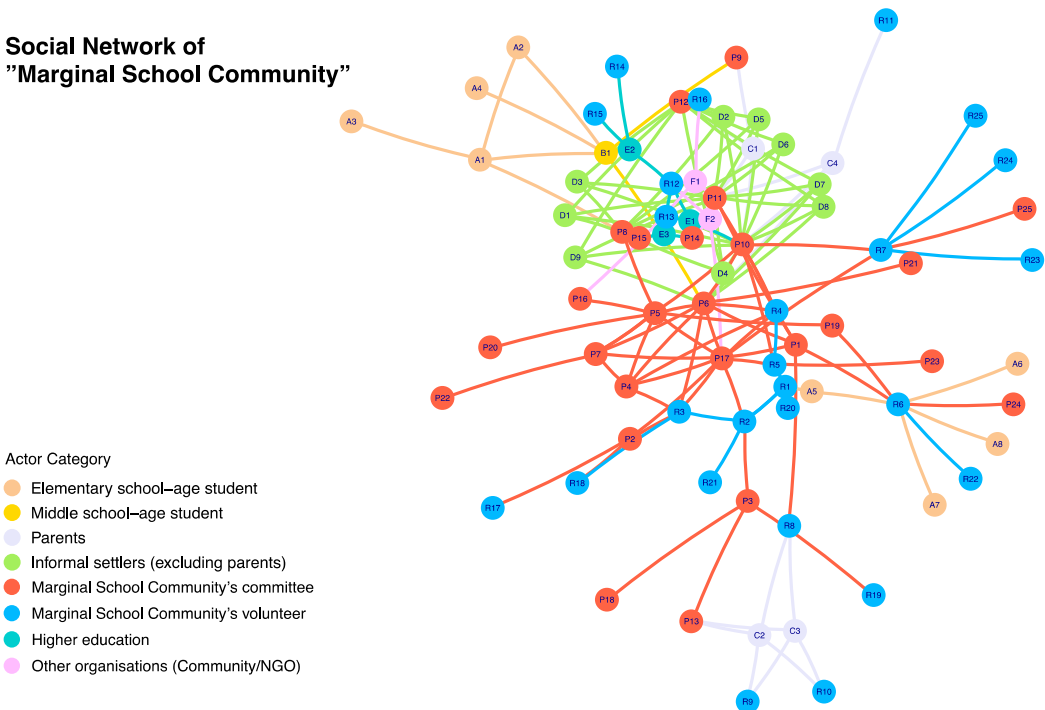

Figure 4. Social network of the Marginal School Community. (*Layout method: Kamada Kawai*).
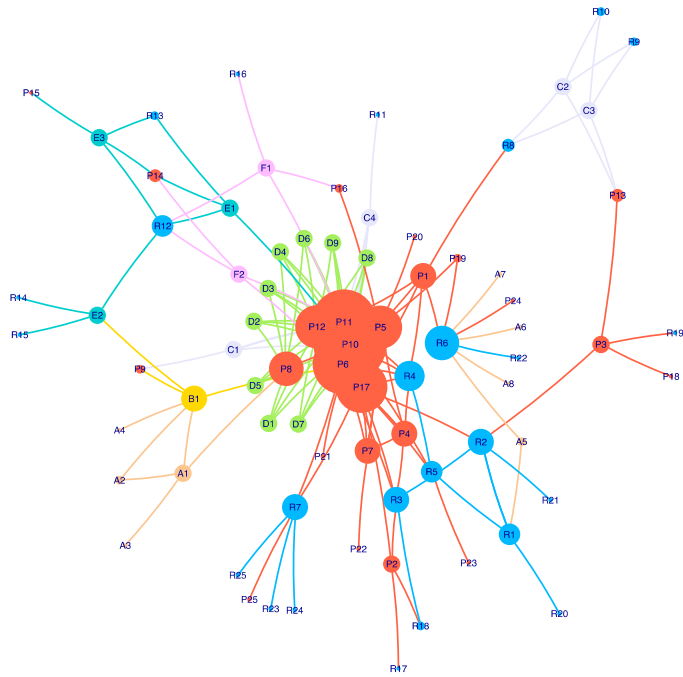
Figure 5. Degree centrality of Marginal School Community. (*Layout method: GEM force-directed*).

centrality of the network (see Figure 5). Based on the analysis, the average degree centrality of the network is 0.050 with a minimum value of 0.013 (A3, A4, A6, A7, A8, P15, P18, P20, P21, P22, P23, P24, P25, R11, R14, R15, R16, R17, R19, R20, R21, R22, R23, R24, and R25) and a maximum value of 0.223 (P10). The graph shows that several persons in the MSC's committee are central to the network and can be identified as the key actors. These actors are P10, P11, P6, P17, P12, and P5. As Borgatti, Everett, and Johnson (2013) described, actors with a higher degree of centrality are the determinant of the initiatives. They act as the keeper of leadership that become the backbone of the initiatives and are essential to mobilize the resources to achieve the organization's end goal (Giuffre 2013). In this case, these actors are the driver of the activities of the MSC.

Secondly, the connectors are shown by analyzing the betweenness centrality of the network (see Figure 6). Based on the analysis, the average betweenness centrality of the network is 0.035 with a minimum value of 0 (A2, R18, A3, A4, A6, A7, A8, P15, P18, P20, P21, P22, P23, P24, P25, R11, R14, R15, R16, R17, R19, R20, R21, R22, R23, R24, and R25) and a maximum value of 0.242 (P17). The graph shows that several persons in the MSC's committee are central connectors that connect all actor categories within the network. These are P17, P1, P6, and P10. Interestingly, several MSC's volunteers also act as connectors between some students, parents, and other volunteers and the MSC's committee. This role is prominently shown by R6, R2, R7, and R8. Another finding indicates that B1 as a middle school-age student seems to act as a connector between the elementary school-age students and the MSC's committee. As Borgatti, Everett, and Johnson (2013) notes, actors with a higher betweenness centrality are valuable persons to ensure internal and external communication and information dissemination. They act as the keepers of information among a group of actors, which are important to manage information to execute the organization's activities (i.e. announcement, proposal, and fund gathering).

Thirdly, the solidity of the network is shown by analyzing the closeness centrality of the network (see Figure 7). Based on the analysis, the average closeness centrality of the network is 0.285, with a minimum value of 0.190 (P15) and a maximum value of 0.420 (P6). However, overall, the value of

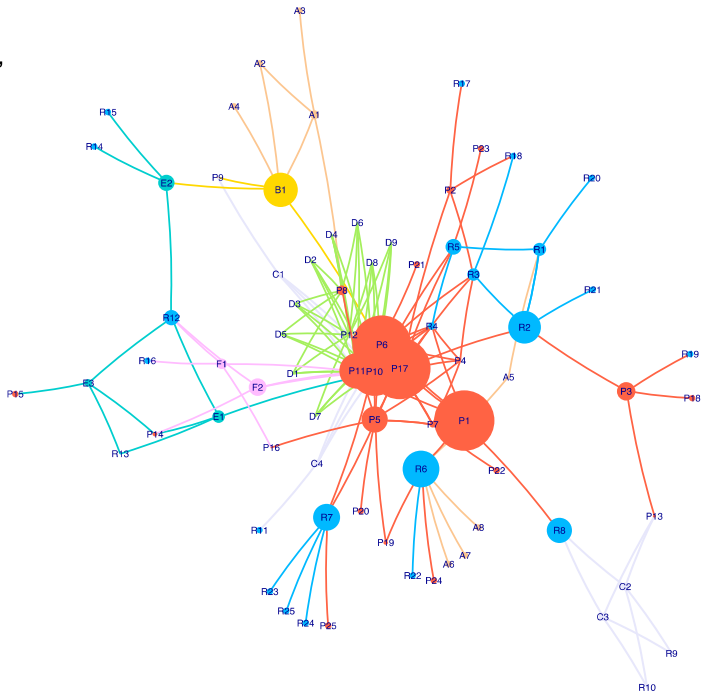**Betweenness Centrality of "Marginal School Community"**

Figure 6. Betweenness centrality of Marginal School Community. (*Layout method: GEM force-directed*).

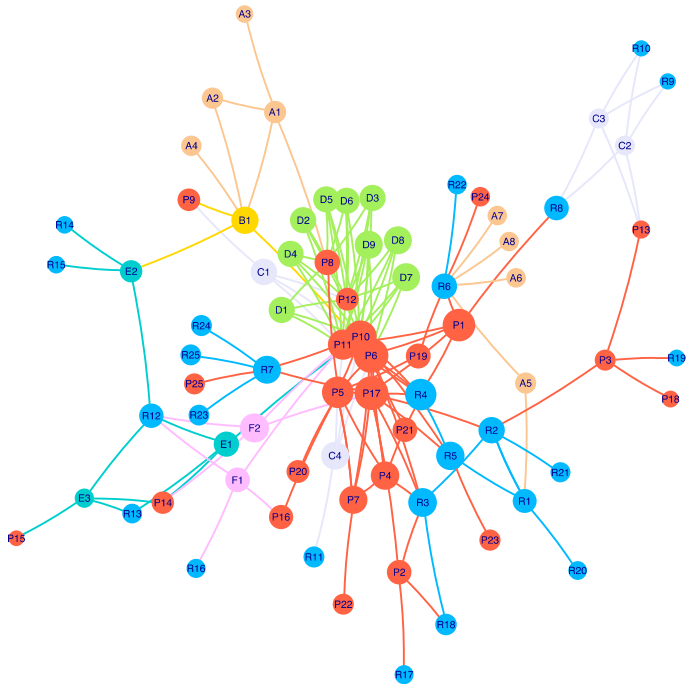**Closeness Centrality of "Marginal School Community"**

Figure 7. Closeness centrality of Marginal School Community (*Layout method: GEM force-directed*).

closeness centrality is evenly distributed among each actor. This means that the network has a high solidity because everyone has access to other persons evenly. This solidity is essential for a grassroots network because it represents horizontal power and governance (Seyfang and Longhurst 2016).

Fourthly, the interaction among actors within the network is shown by analyzing the interaction rate (see Figure 8). The rate was calculated from the average number of interactions between actors in a year. The data originated from a question in the questionnaire: 'in each of the mentioned persons, who have interacted with you in a year? how many times did you interact with them? and for what purposes?' It is an estimation based on each participant's memory showing their interaction intensity rate. To give a more accurate estimation, during the data collection, we helped the participants by reminding them about their interaction with each person over the years by asking them about possible types of interactions, their purpose, and the means of interaction. Some participants, who possess a phone, recalled their memory by tracking their calls, SMS, or social media chat history. Based on the analysis, the average interaction rate is 15.190, with a minimum value of 1 and a maximum value of 20. It reveals that the MSC is an active grassroots organization (at least in the research period, 2020–2021). This represents routine and continuous activities taking place and networks that need to interact with each other, whether related to internal matters (i.e. planning, preparation, and coordination) or external matters (i.e. collaboration, inviting experts, networking building).

The result is based on the questionnaire collected by the MSC's committee and volunteers, and coincidentally, the MSC's committee are the prominent actors in the social network, and the MSC's volunteers are spread across the network. The results were not affected by the fact that the data was collected by the MSC's committee and volunteers because they only read the questions and wrote the answers from the respondents without any influence. They must regularly meet the students, parents, local inhabitants, and organization representatives outside the MSC. Therefore, most respondents stated at least two names of the MSC's committee or volunteers in the questionnaire, making their centrality and interaction rate higher than other respondents.
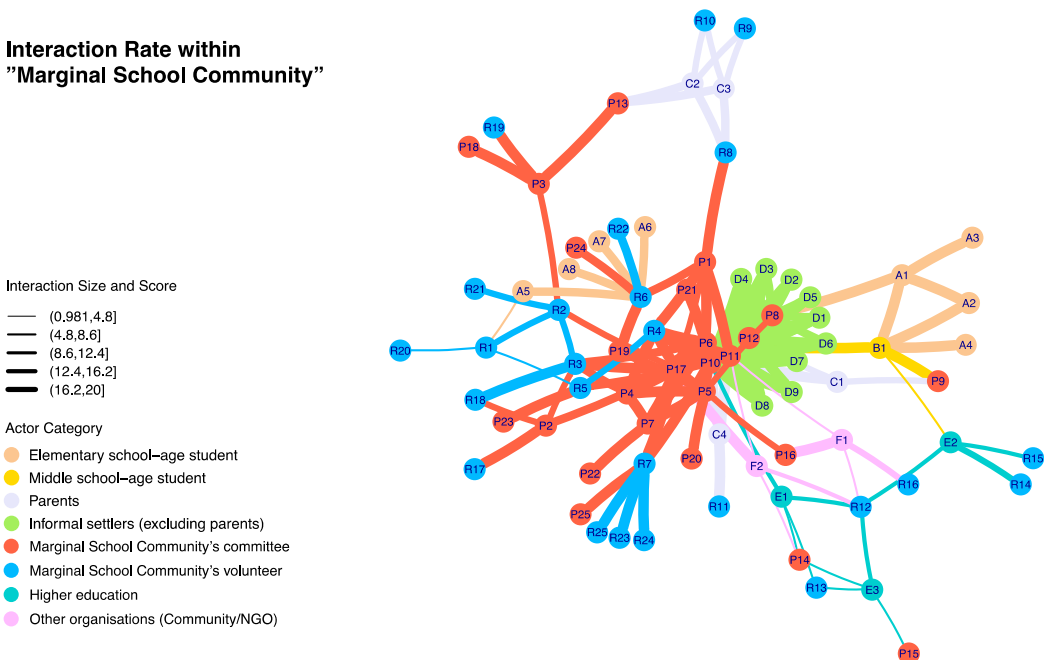

Figure 8. Interaction rate within Marginal School Community (*Layout method: GEM force-directed*).

The limitation of this approach is that not all samples participated because most of them were unwilling to participate, and the government institution did not respond to our invitation to participate. The unwillingness to participate in the informal settlement environment can be attributed to lower trust given to strangers and outsiders. Even though the survey was conducted by an insider (MSC's committee and volunteer), there remained a lack of trust. During the data collection process, some of the students' parents did not permit them to participate in this study. We also missed overall voices from the higher education representatives and the MSC's volunteers because of an inability to sync people's time.

However, this does not affect the overall findings of this study because we asked them about a minimum of four and a maximum of eight persons who were at the top of their minds when they did activities within the MSC initiative. Forty-three new names were identified as interacting with the respondents. Hence, we actually got a proportional number of persons interacting within the network even though the number of students who act as respondents is low and there was no response from the government. That is why, for example, the number of elementary school-aged children is higher than the actual sample. Based on this, we can also see that none of the respondents mentioned the government.

From the experience, no governmental institution interacted with the MSC in any form. Based on the MSC's partnership data, no government institutions had or have a partnership with MSC. However, there was a time when the MSC committee tried to advocate for the students to get a birth certificate and the informal settlers to get civil registration identification, but the government did not pursue this because they lacked legal papers or were not from Yogyakarta Urban Area. Their parents are mostly migrants from other cities, and so do not have identity cards. This kind of feedback from the committee helped us reflect on how government interacts with the initiative.

This also strengthens the argument of why we chose to make the MSC committee and volunteers to assist us in collecting the data, as it can uncover the true interaction between actors without any interventions from outsiders. The outcome might have been different if we had collected the data ourselves.

5.2. The implications for government

The results offer several implications for the possibility of building a government-grassroots interaction for urban planning. Two issues are pertinent: initiative diffusion and policy development. First, the network will benefit the city if the initiatives can be utilized to create broader outcomes (Seyfang 2010). Therefore, the primary benefit for planning is the alignment of grassroots initiatives outcomes with its processes. To do this, the government could interact with the grassroots by taking on the role of an orchestrator of the initiative, and adopting several diffusion strategies, such as scaling-up, replication, and co-opting (Seyfang and Longhurst 2016). In scaling-up, the government interacts with the MSC by facilitating the latter's recruitment of more members, volunteers, and participants; creating more extensive activities; and giving significance to the outcomes. Having reached a stage of maturing and learning, the government may then decide which other locations or sectors the initiatives could be replicated in. It has to be noted that such a relationship can only be implemented only if both parties are open to each other and create a partnership based on trust.

This diffusion aims to fill the gap of certain urban aspects that the government cannot handle continuously by themselves, especially through daily operations. To utilize the network using diffusion strategies, the government approaches the key players of individual grassroots initiatives and builds communication with the connectors. Therefore, the government will use these to influence other actors and share related information across the network. As a result, there is limited dispute and confrontation between the government and key actor category within the network (i.e. the informal settlers and the MSC's committee) (Healey 1992).

However, there may be occasions where the government may confront the grassroots initiative. As a powerful actor, the government could influence the key actors by refusing to continue the

initiative for reasons related, perhaps, to its perceived legality. However with strong grassroots support and a high solidity of the network, there is a possibility for the grassroots actors to challenge the government (Healey 2015). In these instances, research has indicated that, ultimately, the government 'wins' these confrontations because the government can always point to the fact that the initiatives are located illegally on the land in the first place and therefore lack legal standing. The grassroots initiatives are also at a disadvantage because they lack their own legal advisors or full time NGOs to support them in dispute resolution.

With regards to policy development, there are several potentials that the government could go further than they presently do and usefully contribute to operationalizing the UN Sustainable Development Goals. This might include integrating the diffusion strategies of the grassroots initiatives into urban planning processes formally to utilize the initiative and network creatively, a move that has been suggested elsewhere (United Nations 2020). For instance, in the replication strategy, the government can spatially analyze what areas of the city exhibit similar problems as the informal waste picker's settlement, and develop it through educational programmes. In the scale-up strategy, the government can co-opt the grassroots networks to implement initiatives from its urban policy agenda to both assist with action and expand the grassroots' function, finance, and legitimacy. In the case of MSC, this might encompass activities beyond waste management and education, such as housing and environmental issues.

One of the interesting findings from the analysis is that it seems the middle-school-age student becomes a kind of a 'representative' of the elementary-school-age students, which makes sense as they are older and viewed as the ones who can take bigger responsibility by the elementary-school-age students. It means that in dealing with students' voices and views during the planning process, talking with the older students is essential.

Networks of grassroots initiatives, such as MSC, can open a broader interaction with the government only if there is a bidirectional relationship between them. It means that both government and grassroots need to support each other to boost the outcomes of the initiatives. Without this mutuality, it will take a longer time to pursue the end goal of urban transformation.

6. Closing the gap: action planning through government-grassroots interaction

The research offers some insights into the appropriation and development of action planning within government-grassroots interaction. In conventional twentieth-century planning, the government and the citizen have had, on times, a confrontational relationship over the content and trajectory of plans and development proposals (Hamdi 2004). In part, this may be because plan preparation and plan implementation are two separated worlds, each having their own formal stages, goals and owners (Watson 2014). Citizens, communities and other grassroots networks are also at a disadvantage because they are outside the formal planning processes and have selective input in time and subject matter. In twenty-first century complex processes of urbanization, government may find it difficult to produce an all-encompassing blueprint plan to address a range of multifaceted and interlinked problems (Batty 2018), since they may not possess the administrative, political or financial tools to enable them to deliver, and because they now operate in a myriad of interested actors and agencies (Baptista 2019). Rather than constantly attempt to play catchup on issues by using twentieth-century planning tools, governments might more usefully begin to embrace complexity and, by synergizing with grassroots initiatives, jointly work on initiatives that are already taking place across the city. This also means moving away from a single plan entity and devising, in its place, several future scenarios for urban transformation (Dixon and Tewdwr-Jones 2021; Ravetz, Neuvonen, and Mäntysalo 2021).

Action planning can help to synergize the political (strategic) and the operational (practical) worlds, enabled by intermediary actors, comprising individuals at the grassroots working with relevant professionals within government. This is represented diagrammatically in Figure 9 which shows how different governance characteristics are bridged by intermediaries. Adopting
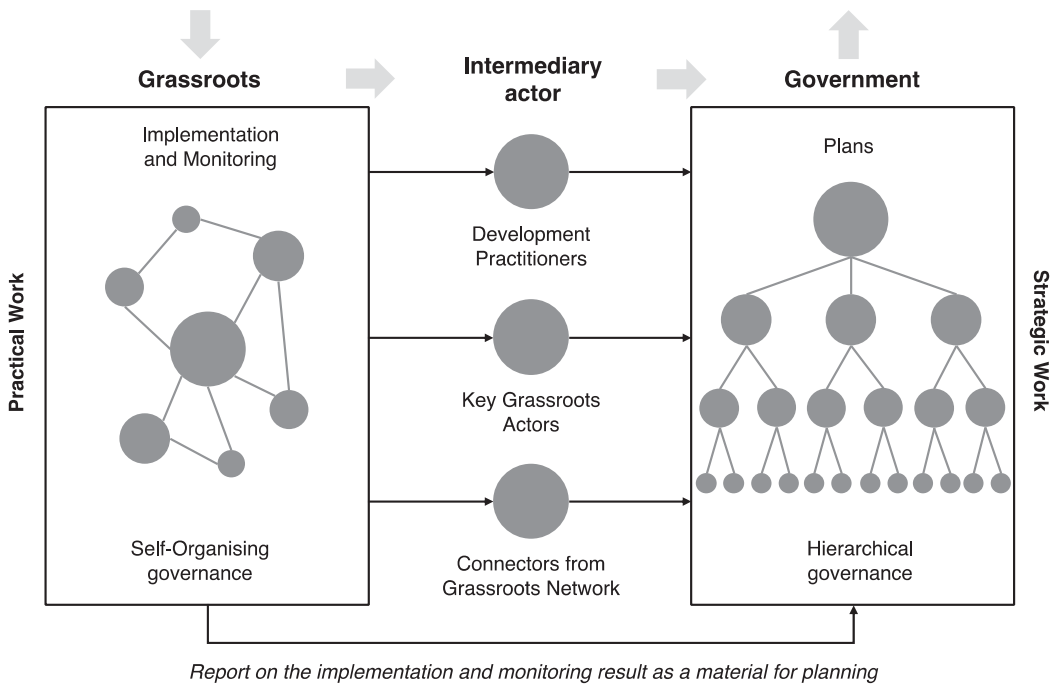
Report on the implementation and monitoring result as a material for planning

Figure 9. Grassroots initiatives-planning policy synergy. Source: authors.

governance modes from Newman (2001), in the practical work that is conducted by grassroots, the actors deliver their project implementation and monitor it in a form of self-organizing governance through a coordinated and networked horizontal structure and decentralized system. To connect the implementation part into planning, there are three actors who can take on the role of intermediary to communicate with the government, namely development practitioners, key grassroots actors, and connectors from the wider grassroots network.

This is a conceptual development of the action planning framework developed by Hamdi (2004) in which he suggested that only development practitioners (i.e. government planners, NGOs, and consultants) could connect the two worlds. Here, the intermediary actor communicates with the government by reporting their implementation outcomes and monitoring results (i.e. problems, needs, and opportunities) that are then assessed by governmental bodies as material to develop a plan.

The government develops the plan with the relevant considerations they have received from the grassroots, with a requirement for further coordination with other hierarchical governmental agencies to implement the plan. It must be noted that, in this model, a 'plan' refers to the synthesis of grassroots initiatives and monitoring results together with the development of strategies and policies to address any needs and opportunities that are found in the early stages of the work. It is a totally different type of plan to the type usually associated with twentieth-century planning, written and owned by government alone.

Three interaction types must be embraced by the government and the grassroots under the action planning process, namely collaborating, negotiating, and mutuality. Only with these foundations for interaction will action planning be conducted because the process rests on and is determined by cooperation and trust (Newman et al. 2008). Without it, it is likely that these two worlds will remain apart (Laforge, Anderson, and McLachlan 2017). Rather than grassroots citizens being on the outside of a closed government-controlled planning process, this revised form of grassroots-government interactive action planning positions the grassroots actors central to the process: they

are as much enablers as beneficiaries, as representatives of communities as facilitators for government responses.

7. Conclusions

This paper has discussed an alternative mechanism to build interaction between the government and grassroots actors to fill a gap under the context of self-governed grassroots initiatives, using a case of the Marginal School Community social network in Yogyakarta. The reason for selecting MSC in the first place was a prior awareness that not only had a grassroots initiative been set up to deal with what was ostensibly a government task in an informal settlement (i.e. basic infrastructure), but the style of grassroots activity had already been expanded to another sector (education). Based on the network centrality measurements, the critical finding of this research lies in the essential role of key actors and their social networks within the grassroots initiative. These have become the backbone of the activity, drive the initiatives, and act as connectors through essential internal and external communication. The research found that an evenly distributed network among grassroots actors is essential to the long-run implementation of initiatives. The high interaction rate, in turn, strengthens the activity further among participants and promotes ideas for further interaction and projects across and within the urban settlement.

Social Network Analysis offers a useful frame and methodology to understand and identify actors' interaction in the context of urban planning. It deconstructs the interaction into networks, key actors, and connectors, in order to provide a detailed picture of how and who takes the initiative. It is useful to reveal how the government could respond to grassroots activity and align smoothly to take on the role of orchestrator by adopting diffusion strategies, such as scaling-up, replication, and co-opting.

To do this successfully, as the MSC case revealed, the government needs to approach the key actors and connectors within the grassroots network. But, in the opposite direction, in order to have a strong legal foundation and allow a continuous operation of initiatives within informal settlements, the key persons of the network should build communication with the government. The network can open a broader interaction with the government if only there is mutuality between them.

Under the action planning framework, the initiatives taken by grassroots are represented at the implementation and monitoring stage within practical work. The framework also represents a way to connect the world of practical work characterized by self-organizing governance and strategic work characterized by hierarchical governance. We labelled this activity as grassroots-based planning policy that offers an opportunity for urban planning and governance to be conducted by a task distribution between the government (planning-controlling-evaluating) and the grassroots (organizing-actuating) through collaborating, negotiating, and mutuality.

Future research might explore the type of government institutions and actors that should be approached by grassroots communities to secure a role and receive support. Such a study might also review different types of planning arrangements. There is also a need to explore the interaction in the whole stages of the action planning framework to ensure that the framework is applicable to all actors.

This research has been based on an example case in one city, and so there is a need to understand the wider governance, place-leadership, and contextual circumstances that might enable or inhibit action planning in design and practice. Such a reconfiguration of roles acknowledges that citizens are well positioned to not only understand the complex array of problems that they themselves experience on an everyday basis, but also to play a part in identifying embedded solutions. At a time when we are witnessing the constraints of representative government through inadequate resources, the disenfranchisement of a broad cross-section of urban society from decision-making, and the need to address complex urbanization problems urgently, new concepts, new methods and

new practices are all required to meet our evolving sustainable development and urbanization challenges.

Disclosure statement

Funding

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