Community mosaic models – a tool for defining communities within disaster risk management

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Abstract

Purpose – Community is hard to define, but understanding what constitutes a community is crucial for effective decision-making. This article presents the idea of the community mosaic model. The model offers a flexible and operative tool for researchers, policymakers, and practitioners to identify and explore communities.

Design/methodology/approach – A two-phase systematic literature review established the theoretical definition of community. Following this, the three parts of the community mosaic model were conceptualised. Finally, the mosaic model was tested with a working example of a community association called the La Brouck collective in Belgium.

Findings – The article outlines a unique operative tool called the community mosaic model and how it can be applied in practice. Furthermore, the article highlights theoretical insights from the approach and how it can inform practice and policy around Disaster Risk Management (DRM).

Practical implications – The community mosaic model helps operationalise the term "community". It provides DRM experts (and potentially beyond) with a tool to identify community groups and explore why they exist in each context. The model could facilitate the development of fit-for-purpose engagement strategies, map adaptive governance structures, and inform policy, potentially enhancing community-based disaster risk management (CBDRM).

Social implications – The article could help to empower community-based disaster risk management.

Originality/value – The article defines an original operative tool as the community mosaic model and provides a working example of its application based on real-world experiences. Also, the researchers revised the proposed lifecycle stages of community groups to include the stage "decay".

Keywords Definition, Community, Community mosaic model, Disaster, Community-based disaster risk management, Tool

Paper type Research paper

Introduction

The role of communities in disaster risk management (DRM) is a popular topic for research (Patterson *et al.*, 2010; Maskrey, 2011; Shaw *et al.*, 2012; Lavell and Maskrey, 2014; Rajabi *et al.*, 2021). Researchers emphasise communities' crucial function in disaster prevention, preparedness, response, and recovery (Patterson *et al.*, 2010; Shaw, 2016; Harris *et al.*, 2018; Imperiale and Vanclay, 2019). Such research has manifested under terms like "participatory approaches" (Scolobig *et al.*, 2015), "people-centred approaches" (Azad *et al.*, 2019), "community-centric approaches" (Pramanick, 2018) and community-based disaster risk management (CBDRM) (Zhang *et al.*, 2012; Van Niekerk *et al.*, 2017). These have become default terminologies when working at the local spatial scale (Titz *et al.*, 2018). For this article, we chose to refer to CBDRM. Contemporary academic research champions the benefits of CBDRM, including the development of fit-for-purpose solutions considering local socio-economic contexts (Lin *et al.*, 2017), a reduction in the cost/resources needed to

implement DRM solutions at the local spatial scale (Chadburn and Anderson, 2013), the ability to draw from unique or indigenous expert knowledge (Khailani and Perera, 2013; Kasdan, 2016; Ali *et al.*, 2021; Sharma, 2021) and, finally, the empowerment of local people to take unsolicited actions (Chen *et al.*, 2006; Hashemipour *et al.*, 2017; Briones *et al.*, 2018). Naturally, this has been coupled with contemporary research that provides frameworks, methodologies, and models to enhance it (Hashemipour *et al.*, 2017; Durrant *et al.*, 2022).

Despite the importance, scholars have demonstrated difficulties in facilitating such approaches and the lack of CBDRM in practice and policy (Hosseini *et al.*, 2017; Pandey, 2018; Yore *et al.*, 2018). Furthermore, the term "community" within the context of DRM lacks a coherent definition (Marsh and Buckle, 2001; Titz *et al.*, 2018; Räsänen *et al.*, 2020). It is sometimes misused (Marsh and Buckle, 2001; Titz *et al.*, 2018) and understood divertingly (Mulligan, 2014; Räsänen *et al.*, 2020), resulting in the term meaning everything and nothing simultaneously. Furthermore, previous research has demonstrated that the failure to develop CBDRM can be partially attributed to oversimplifying the term "community" (Buggy and McNamara, 2016; Titz *et al.*, 2018).

Developing a coherent definition of a community is not easy. For example, Titz *et al.* (2018) report that developing a definition is challenging because it is "impossible to agree on a least common denominator of what a community is.". Furthermore, Titz *et al.* (2018) explain that the term community is often used without consideration of its meaning. Titz *et al.* (2018) state, "The way "community" is used both by scholars and practitioners is that it distinguishes or even enables the ignoring of the reasons why disasters happen". Räsänen *et al.* (2020, p. 2) have shed light on this, stating, "... Community must be defined and operationalised to be meaningful in light of DRM. In turn, applied DRM aims to strengthen a community's resilience and then the very definition of a community is of obvious importance.".

There is a pressing need to develop clarity, particularly within the context of DRM as an academic endeavour to enhance our theoretical and conceptual understanding. But also, as an operational exercise with practical outputs ensuring that the benefits of CBDRM can be fully realised (Sullivan, 2003; Titz *et al.*, 2018; Räsänen *et al.*, 2020). In short, there is an opportunity to clarify and operationalise the term community in the context of DRM. Understanding what communities exist and what defines them could help us integrate them better into decision-making and policy. The reasons for this are three-fold. Firstly, from an academic perspective, it consolidates contemporary research at a time when CBDRM is a popular research topic. Second, it facilitates the creation of a flexible (but consistent) model that practitioners can apply to yield operative outputs in practice. By way of example, similar visualisation has facilitated partnership building and consensus creation (Kramer *et al.*, 2012), greater clarity (Walker *et al.*, 2008), and tailored engagement strategies (Thomsen *et al.*, 2009). Third, it can provide a foundation for drawing similarities between community groups, facilitating knowledge sharing and between similar communities.

Methodology

The methodology consists of two stages. Stage 1 - The two-phase systematic literature review establishes a conceptual basis to pinpoint the relevant material across different disciplinary lenses. First, a Scopus search on the terms "Community", "Definition", and "Disaster" was used to scrape relevant material. Four hundred twenty-four papers included these terms within their title, abstract and keywords between 1979 and 2022. To reduce the number, the search parameters were restricted to articles published within the disciplinary lenses of "Social sciences", "Environmental sciences", and "Earth and Planetary sciences". This reduced the number of articles to 227. A screening of the article abstracts identified articles explicitly exploring the term Community. A shortlist of 23 articles was considered highly relevant to the research question and read in full. Following this, a forward snowballing methodology (Wohlin, 2014) was employed in those 23 articles. The snowballing method was used to

identify a refined shortlist of 28 articles that either refer to or explicitly define "Community" within the context of DRM. Alternatively, it was also used to identify articles referencing vital variables that could define a "community".

Stage 2—Apply the results from the literature review to develop the conceptualised community mosaic model and apply it to a working example. The working example focuses on a community association called The La Brouck collective in Belgium. The La Brouck collective was a community association that arose after the July 2021 flooding across Western Europe (Tradowsky *et al.*, 2023). As a source of raw data, the researcher pulled data from an interview conducted with community associations by the University of Liege after the flood. The interview with the La Brouck collective occurred on February 5, 2022. It was conducted in the community's native language (French) and consisted of one researcher and two members of the La Brouck collective. Figure 1 encapsulates the two-phase systematic literature review methodology used to reinforce this research article.

Results
Findings from the two-phase literature review
This section highlights the systematic literature review results and the shortlist of 28 articles. For each reference, the article highlights its added value through quotations. Table 1 encapsulates the findings of the two-phase literature review.

Conceptualising the community mosaic model
The following section outlines the community mosaic model. The community mosaic model is separated into three parts. The parts are progressive, as one part inherently feeds into the next. Part 1 allows the user to define whether they observe a community. Part 2 unpacks the defining
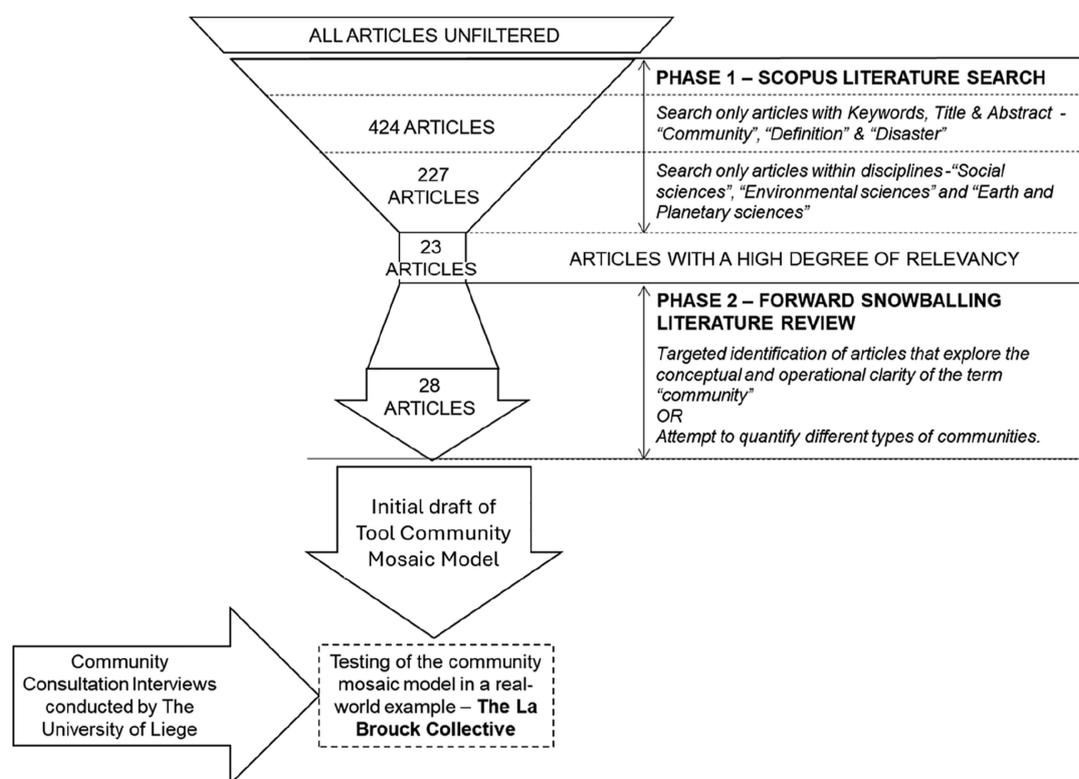

Figure 1. Two-phase systematic literature review methodology. Source: Figure by authors

Table 1. The core articles distilled from the two-phase systemic literature review and their contributions to the definition of community with the community mosaic model

Source	A conceptualised definition of "community."	Definition of different community typologies, classifications, groupings etc.	Key variables, defining features or characteristics
Dynes (1994) *referenced in Whittaker et al. (2015)		Type I – Established organisations *involve routine tasks performed through existing structures For example, firefighting performed by a state fire agency* Type II – Expanding organisations *undertake regular tasks through new structures. These are typically volunteer associations or groups whose core activities are non-emergency related but have latent emergency functions* Type III – Extending organisations *have established structures but take on new and unexpected functions during the emergency period* Type IV – Emergent organisations *are groups with new structures and new tasks. They emerge when needs are not being met, or it is perceived that needs are not being met, by other organisations*	
Emergency Management Australia *referenced in Sullivan (2003)		Geographical based groupings Shared experience-based groupings Sector-based groupings Function-based groupings	

(continued)

Table 1. Continued

Source	A conceptualised definition of "community."	Definition of different community typologies, classifications, groupings etc.	Key variables, defining features or characteristics
Marsh and Buckle (2001) *referenced in Nicholls (2006)		<u>Communities of affection or function</u> *may be based on ethnicity, class, or gender when they have emotional ties with each other, where there's a group sharing something together* <u>Communities of competition</u> *where groups come together as they compete for a temporary alliance for economic, political and or social resources; even these temporary alliances may generate some social cohesion* <u>Community of interest</u> *are based not on an area but on the industry, labour or social or recreational interests recreational, as we may find with union members, industry associations or primary producer associations* <u>Communities of status groupings and interests</u> *are based on occupation, income level and type and level of skill that may co-exist within a given local government area, e.g. manual workers, professionals, farmers, services workers, non-paid workers (retired, unemployed and home duties.)*	- Location or geographic area - Notion of "space" (e.g. access to resources, transport systems and government) - [Community] Interests - Relevant demographic features
Masolo (2002) *referenced in Nicholls (2006)	*"Community is not a static entity, but a combination of open-ended groupings defined by organising cultural beliefs and practices, constantly open to change."*		

(continued)

Table 1. Continued

Source	A conceptualised definition of "community."	Definition of different community typologies, classifications, groupings etc.	Key variables, defining features or characteristics
Gordon (2004) *referenced in Nicholls (2006)	*"A community is a large, relatively stable collection of groups and individuals, organised with coherent relationships on multiple dimensions . . . A community occupies a common locality with a relatively stable social structure of authority, power and prestige and with a common culture (Alperson, 2002). Its members are interdependent, with networks enabling them to meet each other's needs and provide security . . . In this model, a community can be likened to a crystalline structure with social units and subsystems bonded to each other in patterns of varying strength and distance . . ."*		
Abarquez and Murshed (2004), p. 8)	*In the context of disaster risk management, a community can be defined as people living in one geographical area who are exposed to common hazards due to their location. They may have a common experience in responding to hazards and disasters. However, they may have different perceptions and exposure to risk. Groups in the locality will have a stake in reduction measures. Either in favour of against*		

(continued)

Table 1. Continued

Source	A conceptualised definition of "community."	Definition of different community typologies, classifications, groupings etc.	Key variables, defining features or characteristics
Sullivan (2003) *referenced in Nicholls (2006)	*"A group of people who interact, but who may do so within and between a number of sub-communities … The Community need not be bounded by geography, but for the purposes of analysing the effects of emergencies on communities in terms of recovery, will be bounded by the impact of the emergency"*	*"Specifically, Community, for the purposes of this paper will be taken as referring to a group of people who interact, but who may do so within and between a number of sub-communities, such as those referred to earlier by Marsh and Buckle (2001). The Community need not be bounded by geography, but for the purposes of analysing the effects of emergencies on communities in terms of recovery, will be bounded by the impact of the emergency"* (Sullivan, 2003, p. 20)	- Geographic isolation of the Community from others - Extent to which community members are isolated from each other - Degree of self-sufficiency - Level of Community Spirit (Social Capital) - Degree to which families are dispersed geographically - Mobility of community members - Equality of distribution of authority - Level of inherent conflict within a community - Risk awareness - Susceptibility to sources of risk - Resilience with respect to a realised source of risk - Level of preparedness, both response and recovery - Pre-emergency economic viability
Nicholls (2006)	*"a social grouping which interacts, albeit inconsistently, on a number of levels; often but not necessarily bounded by a geographic commonality but bounded by the effects of the disaster; and characterised by a self-recognised and self-defined commonality of experience which changes overtime."*		- Geographic boundaries (often but not always) - Shared necessities
Olsen and Clay (2008)			- Resources and equipment owned and available to the Community - Participation of members' interactions - context and heritage values
Norris *et al.* (2008) *referenced in Barrios (2014)	*"An entity that has geographic boundaries and shared fate."*		- Geographic boundaries - Shared necessities

(continued)

Table 1. Continued

Source	A conceptualised definition of "community."	Definition of different community typologies, classifications, groupings etc.	Key variables, defining features or characteristics
Barrios (2014)	"... conceptualisation of community as an entity that remains static over time and whose pre-trauma capacities help it navigate the challenges of catastrophes and reconstruction are not in tune with the realities of disaster-affected communities."		- Stability over time
National Institute of Health and Care Excellence (2016) *referenced in Ramsbottom et al. (2018)			A– Context — Existing relationships and trust — Existing Community Organisations, practices, cultures and expectations B– Infrastructure — Planning to support community engagement. Resources and funding and capacities and needs — Community Ownership C– Process — communication with the Community — engagement and timeline — Engaging vulnerable groups
Ramsbottom et al. (2018)	"A socially and/or spatially defined group with particular shared characteristics (such as geographic location, cultural practices, beliefs etc.), where community members can be based on self-identification and/or external attribution."		
Titz et al. (2018)	Figure to explain "community" conceptualisation		

(*continued*)

Table 1. Continued

Source	A conceptualised definition of "community."	Definition of different community typologies, classifications, groupings etc.	Key variables, defining features or characteristics
Lorna (2019, p. 3)	*"A community is a group of individuals and households living in the same location. And having the same hazard exposure, who share the same goals and objectives in disaster reduction."*		
Räsänen *et al.* (2020)		"Place-Based Community – *Totality of individuals and social structures within a geographical location, e.g. a village includes inhabitants, organisations, institutions and authorities therein"* "Interaction-based Community – *Network of interactions between people; foci on informal cooperation and everyday life; civil society organisations can be an important forum for interactions"* "Community of practice and interest – *a network of specialised and/or professional actors that engage in common actions, imagine a shared identity and align activities towards a shared goal"*	Geographical boundaries (place based) Experience of collaboration Shared vision

Source(s): Table by authors

dimensions and arranges them into a "community mosaic". Part 3 determines the life cycle stage of that community.

Part 1: Defining the term community within DRM.

Figure 2 distilled the necessary research for a conceptual definition of community. A consensus could only be seen amongst three defining elements. The three defining elements are referred to as primary criteria as they appeared familiar to many sources. In contrast, conflicting elements, such as the importance of the geographical scale, were deemed secondary criteria. The secondary criteria were perceived as not crucial in identifying a community but can help unpack its defining characteristics later in the community mosaic model. The primary criteria used in defining a community are.

(1) A community is a *collection of individuals or a group of people.*

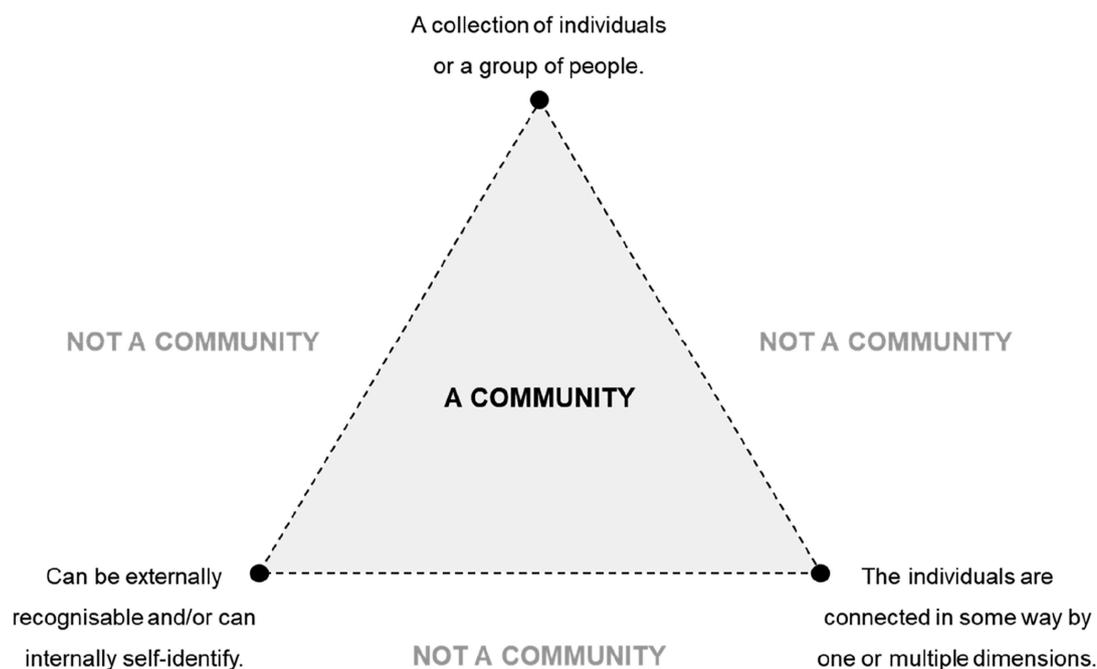(2) A community can be *externally recognised and/or internally self-identified.*

A collection of individuals
or a group of people.

NOT A COMMUNITY   NOT A COMMUNITY

A COMMUNITY

Can be externally   The individuals are
recognisable and/or can   connected in some way by
internally self-identify.   NOT A COMMUNITY   one or multiple dimensions.

Figure 2. The primary criteria that can be used to identify and define a "community" within the context of DRM. Source: Figure by authors

(3) A community is *connected by one or multiple dimensions or shared characteristics.*

Masolo (2002), Gordon (2004), Sullivan (2003), Nicholls (2006) and Ramsbottom *et al.* (2018) all explicitly referred to the term' group' or "grouping" when conceptualising community. Lorna (2019) even went as far as to include a group of households, emphasising the importance of living in a specific area. Furthermore, all the sources in Table 1 referred to or assumed that a community comprises a collection of individuals. Secondly, Nicholls (2006) explicitly stated that "[a community is] characterised by a self-recognised and self-defined commonality of experience". Significantly, Ramsbottom *et al.* (2018) expanded on self-identification by stating that "community members can be based on self-identification and/or external attribution". They are emphasising that the group of people must be recognisable. According to Table 1, the individuals forming a community must be bound by some form of "interest", "experience", or "dimension". However, the actual dimension that binds the community can vary; examples from Table 1 include but should not be limited to cultural beliefs, standard practices, demographics, shared experiences, proximity, or a shared emergency. At this point, it is critical to state that identifying these primary criteria in defining a community isn't novel. Authors across disciplinary lenses have pinpointed these criteria in defining a community (see Räsänen *et al.*, 2020). Titz *et al.* (2018, p. 3) raise significant doubts that "the notion of community as a homogenous group of people sharing mutual interests is a social network defined by location" is outdated. Therefore, we do not begin to propose that this defines a community but instead that these three primary criteria form the common denominator by which a community can be identified (or not). Figure 2 attempts to encapsulate these three primary criteria into an operational model that experts can use to identify (or not) a community. The three criteria are arranged around the perimeter of a two-dimensional triangle. When all three criteria can be observed, experts enter the triangle's interior and observe a community.

Figure 2 is the initial phase in developing an operative definition of community. Table 1 also highlights several secondary criteria. These secondary criteria were not considered common denominators in defining a community. For example, scholars such as Gordon (2004)

and Norris *et al.* (2008) referred to "Geographical context" or "Locality" in their definition. However, other researchers widely debate this (Sullivan, 2003; Räsänen *et al.*, 2020). By way of example, Driskell and Lyon (2002) explore if a virtual community is a true community. They state that a virtual community is not a true community based on traditional notions. However, they go on to state that while vitrail communities are not a true anthesis of a true community, they can provide a "weak replacement". More recent research has built on this notion and stated that functional and impactful communities can exist online through social networks between people who have no shared geographical touchstone (Haythornthwaite, 2012). For this research, therefore, virtual communities can be defined as a community, even if it is considered a weak replacement, geographical location is not a core defining feature of a community.

Secondary criteria elicited from Table 1 have been outlined below.

(1) A community may or may not be defined/bound by a *geographical context or locality.*

(2) A community is *relatively stable and static over time. Still, it is also dynamic and open-ended,* allowing the movement of individuals.

(3) The individuals in that Community can *operate independently but are reinforced by some form of stable social structure or leading authority.*

(4) The participation and/or *interactions between those individuals* can be considered both *coherent but also inconsistent.*

As stated, the secondary criteria are not considered fundamental in determining the existence of a community. Instead, they may help in the defining dimensions/characteristics of a community group and, therefore will inform Part 2 of the community mosaic model.

Part 2 – Defining the Communities and their Binding Dimensions.

Part 2 of the community mosaic model helps practitioners to define the different characteristics of a specific community group. The triangle shape from Part 1 can be unfolded to expose different dimensions of that community. By way of example the list of secondary criteria. Figure 3 demonstrates this process. These binding dimensions build directly upon the multifaceted nature of the term community explored in the literature review.

In practice, the triangle unfolding to map the different dimensions can be done an infinite number of times to account for the myriad of dimensions which bind a community group.

Part 3 – Defining the life cycle stage of a Community Mosaic

Finally, scholars also emphasise the importance of the temporal factor when defining communities within the context of DRM. For example, Sullivan (2003) states that "*Communities have the capacity to disintegrate, reform, change and decline*" *(Sullivan,*
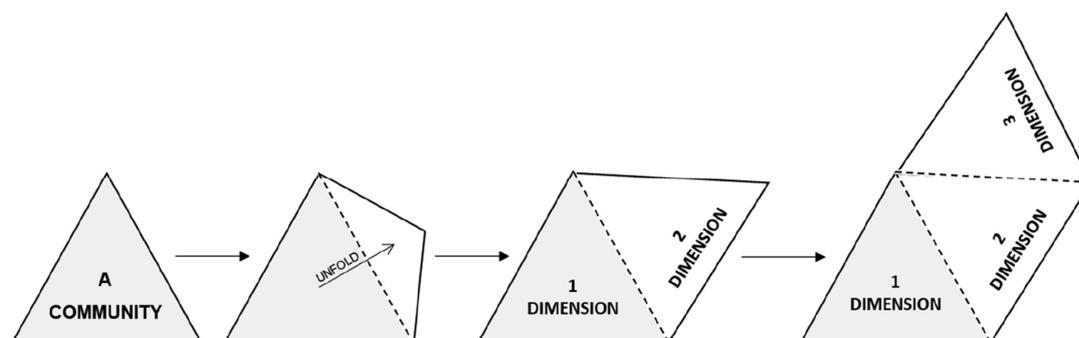

Figure 3. The unfolding of the community in an attempt to map the different dimensions that bind that community group together. Source: Figure by authors

2003, p. 20*). Furthermore, "... characterised by a self-recognised and self-defined commonality of experience which changes over time"* Nicholls (2006). From a broader conceptual perspective, Bosher *et al.* (2021) propose the importance of the temporal factor in the cycles of DRM in their exploration of a DRM Helix.

This highlights that communities are not static entities but continually evolving. This is a crucial element when attempting to develop a meaningful operational definition of Community. Thankfully, theoretical support can be found when exploring the concept of "communities of practice" when considering the temporal factor of a community. A research article was published by Gongla and Rizzuto (2001) when exploring the evolution of knowledge in communities of practice within large organisations. Gongla and Rizzuto (2001, pp. 845) defined a "community evolution model". They outlined the different functions, behaviours, process support and enabling technologies the Community would use in that stage. In short, Gongla and Rizzuto (2001) outlined five stages, captured in Figure 4.

These lifecycle stages, developed by Gongla and Rizzuto (2001), initially consisted of only five stages. Potential, building, engaging, active and adaptive. However, broader academic literature emphasises that communities can decay. As a result, the researchers added a sixth life cycle stage, referred to as decay; this cycle is used to describe communities which have either fulfilled their purpose or have begun to fragment.

Working example – the La Brouck collective
The following section demonstrates the heuristic value of the community Mosaic Model through a working example. The three phases of the community mosaic model have been explored separately, and where appropriate, direct quotations from the interviews have been included.

Part 1 – define the existence of a community
The first step of the community mosaic model is to define whether we indeed have a community group using the three primary criteria outlined in Figure 2. As a reminder, the three primary criteria are.

(1) A community is a collection of individuals or a group of people.

(2) A community can be externally recognised and/or internally self-identified.

(3) A community is connected by one or multiple dimensions or shared characteristics.

The community of La Brouck is a collection of individuals. The interviews stated that they had seventy members at the time of the interview. *"Around seventy. I'll see if we don't have the*
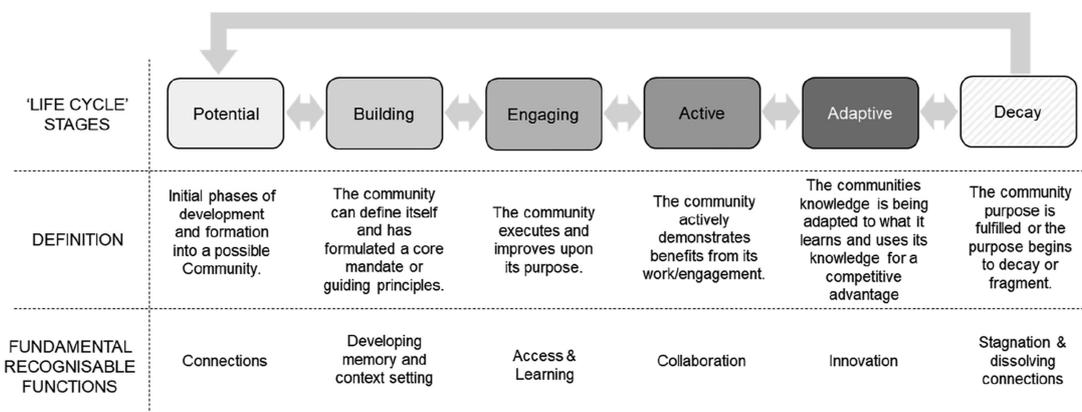

'LIFE CYCLE' STAGES	Potential	Building	Engaging	Active	Adaptive	Decay
DEFINITION	Initial phases of development and formation into a possible Community.	The community can define itself and has formulated a core mandate or guiding principles.	The community executes and improves upon its purpose.	The community actively demonstrates benefits from its work/engagement.	The communities knowledge is being adapted to what it learns and uses its knowledge for a competitive advantage	The community purpose is fulfilled or the purpose begins to decay or fragment.
FUNDAMENTAL RECOGNISABLE FUNCTIONS	Connections	Developing memory and context setting	Access & Learning	Collaboration	Innovation	Stagnation & dissolving connections

Figure 4. Six life cycle stages of a "communities of practice" adapted from Gongla and Rizzuto (2001) and expanded to be applied within the context of DRM. Source: Figure by authors

tickets.". The La Brouck collective can be internally identified by its members. By way of example, one of the interviewees stated, "*Yes, that's it. And we decided that we were called the La Brouck collective*". Furthermore, the Wallon Parliament had also externally recognised the La Brouck collective. This means that the collective had been both internally and externally recognised. To be both is not essential to be defined as a community, but is an important observation.

Finally, the community developed from the July 2021 Flooding. One of the interviewees stated, "*A few days after [the flood event]. So [the person] talks about the first meeting at the initiative of the former head of the neighbourhood committee.*" The individuals within the community had all experienced this event. As a result, the La Brouck collective fulfils all of the criteria defined in part 1 of the community Mosaic model. Figure 5 encapsulates this and includes direct quotes from the interviews as evidence.

Part 2 – Outlining the Communities defining dimensions.

The second part of the community Mosaic Model identifies the dimensions that define the community. By way of example, in the case of the La Brouck collective, one dimension has already been identified in Part 1. Namely, the La Brouck collective individuals experienced the July 2021 flooding across Belgium. This dimension has already been identified because at least one binding dimension must define a community based on part 1 of the community mosaic model. However, a community group likely has more than one defining dimension. After an in-depth analysis of the interview data, researchers identified 12 dimensions that define the La Brouck collective. The 12 dimensions have been captured in Figure 6 as a "Community Mosaic" for the La Brouck Community. Its triangle represents each of the 12 dimensions, each separated by a dashed line to indicate that they are part of the same Community group.

Furthermore, around the edge of the community mosaic is a solid black line, which indicates the boundaries of the La Brouck collective's Mosaic. It is crucial to note that the shape of La Brouck collective's current Community Mosaic is unprioritised. Unprioritised means that the 12 dimensions are currently in a random order. The random distribution of the dimensions is because this community mosaic has been created as an isolated working example. The example lacks context and has no other community mosaics currently acting upon it.

The following section briefly unpacks each of the twelve defining dimensions with supporting quotations from the interview.
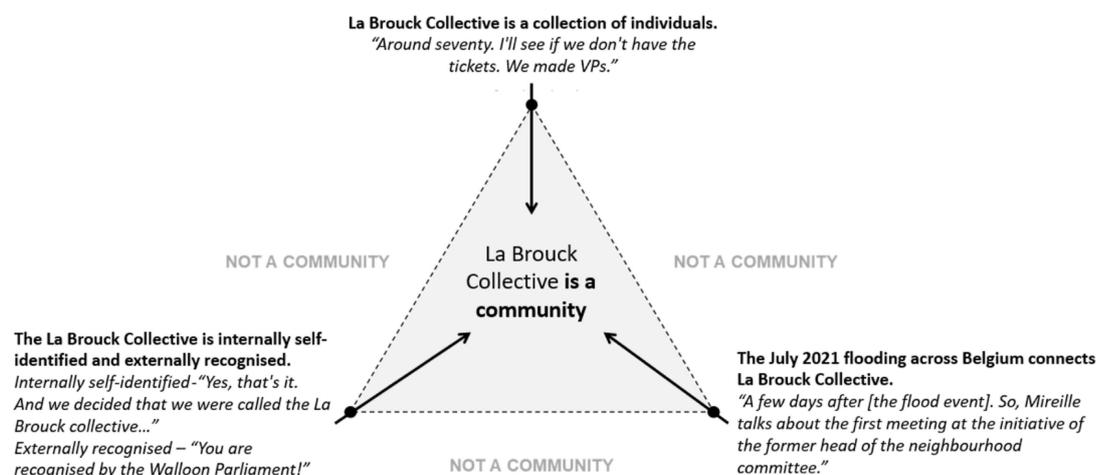

Figure 5. A working example of Part 1 of the community Mosaic model demonstrates that the La Brouck collective can be defined as a community. Source: Figure by authors
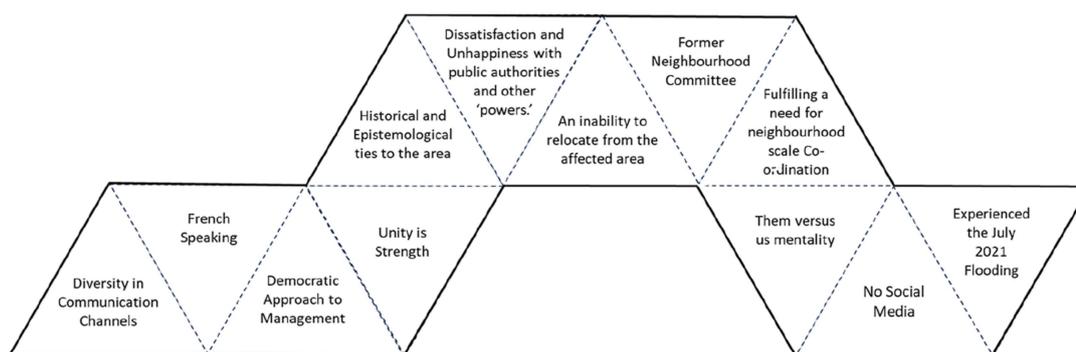
Figure 6. A working example of Part 1 of the community Mosaic model demonstrating the twelve defining dimensions of the La Brouck collective. Source: Figure by authors

(1) *The individuals experienced the July 2021 Flooding event.* The La Brouck collective gained momentum in the response and recovery phase of the July 2021 Flooding. The interviews stated that their first meeting was *"A few days after [the flood event]"*. They even went as far as to state that the initial members of the collective meet amongst the rubble of buildings. As a result, the experience of the flooding event is a binding dimension that links the individuals of the La Brouck collective together.

(2) *Unity is Strength.* During the interview, one of the stakeholders stated the importance of strength in numbers and highlighted that this was a defining dimension of the La Brouck collective. For example, *"the neighbourhood, the inhabitants . . . Because, as they say, unity is strength."* This decision was further supported when a community member stated, *"There was a need for people to speak, to be heard, and so we made it official."* This statement emphasizes that the La Brouck collective gave the individuals within the area a unified voice, especially with the regional authorities: *"From the moment you go to complain to the municipality, and you are alone, we may tend to get carried away. Whereas when you're 70 . . ."*.

(3) *No Social media.* Another binding dimension of the La Brouck collective is their conscious choice to abstain or "boycott" social media. On the one hand, this seemed to result from a strongly formed opinion by members of the La Brouck collective that social media is a tool for time-wasting. For example, the interviewees stated, *"Boycotting [Facebook] – Because we waste a lot of time"*. However, on the other hand, the interviewees went further stating that not communicate through social media was also a practical choice. The interviewee stated, *"A lot of people, including the elderly–because we still have a lot of elderly people here–they don't have Facebook, or they don't work with Facebook."*

(4) *Diversity in Communication channels.* La Brouck collective communicates between its members through various mechanisms. This includes electronic or online methods such as emails, phone calls and text messages. The interviews stated that *"... we operated by email or phone calls."* Furthermore, community members communicate through word-of-mouth, face-to-face meetings and a physical bulletin board. For example; *"Word of mouth. We called them and said we wanted to have a meeting. We have a billboard we posted. And talking to each other."*

(5) *Democratic Approach to Management.* The community members in the interview emphasised the importance of a democratic approach to managing the La Brouck collective. They stated, *"We didn't want an organisation where some had the floor and others didn't . . . We wanted everyone to be able to speak in turn and explain their feelings, the problems people were encountering, etc. I think it happened"*.

(6) *Historical and Epistemological ties to the area.* It became clear from the interview that the community members had significant social and historic ties to the area in which they lived. By way of example, the interviews stated the importance of the community social life "... a*nd you already knew each other a little before or ... I know that in this neighbourhood, there is a relatively important social life."* Secondly, they emphasised the generation ties for their family and the area: "*Most of them are sons of factory workers, and we've known each other since childhood, apart from the last inhabitants who are now arriving from outside. Otherwise, most locals here have known each other for years".*

(7) *An inability to relocate from the affected area.* The community members in the interview stated, "*It has been a problem for many people to find accommodation".* The key driver was that almost all the community members owned their houses. "*Most–the 99% - are proprietary,"* and the fact that short-term rental agreements are not common in Belgium. This would make it difficult for the residents to secure temporary living arrangements.

(8) *Dissatisfaction and unhappiness with public authorities and other "powers".* Another dimension defining the La Brouck collective is the local communities' unhappiness, dissatisfaction and, at times, anger towards the public authorities in the response and recovery phase. By way of example, the interviews stated that "*people were not happy"* and "*a lot of dissatisfaction that day because at the level of the public authorities".* The frustration at public authorities appeared to stem from a multifaceted issue. Firstly, the local community was frustrated with the lack of response and the generally absent nature of public authorities during the response phase, stating, "*That we hadn't seen them. The public authorities, we did not see them".* Secondly, the local people lacked coordination between public authorities and insurance companies in the disaster recovery phase. "*People, they are tired of the situation. After seven months, we are tired of the situation. We are tired of seeing all that is necessary."* Finally, the local people were upset about the lack of aid from the military: "*You go on missions, we send them abroad, but we must tell you that here, the population needs support, we need meals worthy of the name, not all the time eating hamburgers, hot dogs ..."*

(9) *Fulfilling a need for neighbourhood scale Coordination.* It became apparent during the interviews that the La Brouck collective supported the local community at the neighbourhood scale. This is especially true in giving the local people a familiar voice, organising meetings, coordinating volunteer responses and even in legal advice.

(10) *French Speaking* – The spoken language within the village was French. This is a defining dimension of the community members. It was expressed by the local people, mainly when no native French speakers would arrive to provide support: "*Yes, Dutch or Dutch speakers came. Moreover, on the length, it is D. speakers who are here. We have more D. speakers than French speakers and government levels."*

(11) *Them versus us mentality* – underlying the motivations of the La Brouck collective was a subtle them versus us mentality. The local people were unhappy with the response and felt the authorities were to blame for their poor support.

(12) *Former Neighbourhood Committee* – Finally, it appears that the La Brouck collective did not develop spontaneously. The interviews hinted at the initial meetings of the La Brouck collective. The interviewees stated, "*Because there was a first meeting which was held on the initiative of the former head of a neighbourhood committee which dates back a long time ago."*

Part 3 – Defining the Life cycle Stage of the Community (at the time of the interview)

The final part of developing a community mosaic for the La Brouck collective involves defining the lifecycle stage of the community group. According to the interview responses, at the time of the interview, the La Brouck collective was in the "active" stage of its lifecycle. The community has actively shown benefits from its members' engagement. The members of the community have actively secured support from regional authorities. They are actively collaborating and have even started to pursue legal action. Figure 7 encapsulates the final community mosaic for the La Brouck collective after completing the three parts of the community mosaic model.

Discussion

The article outlines the community mosaic model and a working example of its application. The research has both theoretical and practical value. First, the article proposes a theoretical definition of "community" using three primary criteria. In doing so, our findings do not align with the perceptions of Titz *et al.* (2018). As a reminder, Titz *et al.* (2018) state that developing a definition of community is impossible because it is "impossible to agree on a least common denominator of what a community is". In truth definition of community presented within the article required three common denominators instead of one. However, it is important to be critical. The article was developed in the context of an operational tool. Therefore, it was in the researcher's interest to develop a coherent definition which could be used to define a community. Building on the theoretical value of defining the term community, the article fulfils the need for a definition proposed by Räsänen *et al.* (2020). However, unlike Räsänen *et al.* (2020), this article's emphasis was not on exploring different interpretations of community within DRM. Instead, the research focused on establishing an operative tool by which experts could define and then explore the driving dimensions of different community groups. Räsänen *et al.* (2020) outlined three different interpretations of community with DRM—namely, Place-based community, Interaction-based community and community of practice and interest. The Community Mosaic model could be applied in conjunction with the interpretations proposed by Räsänen *et al.* (2020). For instance, if a community is perceived as a place-based community, then the community mosaic model could unpack the specific dimensions that reinforce that community's relationship with the place.

On one hand, when reflecting on the working example, it could be argued that the La Brouck Collective demonstrated elements of all three Räsänen *et al.* (2020) interpretations. The community was in a defined geographical area, joined through a tight social network, delivering specific actions. Therefore, having an operative and replicable tool which could unpack the specific characteristics reinforcing these actions could be valuable. On the other hand, the working example was completed retroactively using interview data. As a result, it is
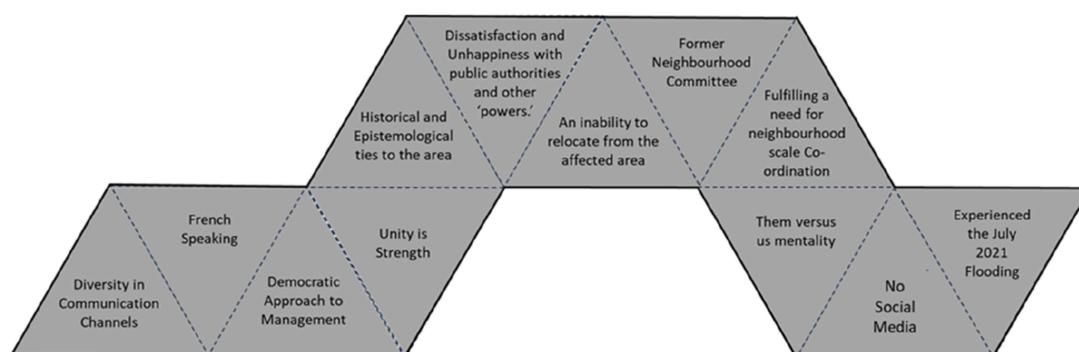

Figure 7. The final community mosaic for the La Brouck collective, containing all three parts of the community mosaic model. Source: Figure by authors

unclear if the members of the La Brouck collective value one of these defining dimensions over another.

The researchers believe that presenting the definition in the context of the community mosaic model has value to DRM professionals. In its simplest form, part 1 of the community mosaic model can identify a community and unpack the context-specific characteristics that motivate it. Researchers such as Ryan *et al.* (2020) highlight that engagement techniques that fail to enhance preparedness can result from the lack of context and skill level of experts. Second, part 2 of the community mosaic model helps experts highlight the community group's defining dimensions. By understanding what binds those individuals and what that community values, DRM professionals can target resources and engage with those communities on issues they consider important. Alternatively, experts can frame policy issues in contexts that the communities are more likely to relate to. Thereby maximising their engagement and facilitating a greater return on investment of participatory approaches helping practitioners to identify what Satizábal *et al.* (2022) refer to as "connectors" between themselves and local community groups.

Finally, part 3 allows policymakers and practitioners to make an informed decision about allocating different resources that maximise CBDRM strategies. For example, if a community is in the "active" life cycle stage, allocating responsibilities and resources would be the most appropriate. This community is likelier to have an effective and active role in the response and recovery phases.

The working example provides a real-world case study of how the approach could apply to a community group. However, it is crucial to note that the community mosaic model for the La Brouck collective was completed in isolation. As a result, the community mosaic presented in Figure 7 is "unprioritised". The term unprioritised refers to the arrangement of the defining dimensions in the community mosaic. Within Figure 7, the dimensions of the La Brouck are arranged randomly. To prioritise the shape of the La Brouck community mosaic, it must be exposed to other community mosaics. Exposing one or more community mosaics to another could rearrange the defining dimensions to show similarities and overlaps between the different community mosaics. This arrangement of the dimensions will then further evolve as more and more mosaics are brought into the model.

Conclusion

This article presents the idea of the community mosaic model accompanied by a working example of how it could be applied. The tool can empower practitioners and policymakers to define visually the communities they perceive. The visual representations facilitate the development of fit-for-purpose engagement strategies and can help to target specific policy goals depending on a community's characteristics. However, we emphasise this work's value with caution; we don't begin to reinforce the notion that communities can so easily be defined. Communities are dynamic, and continual reflection is important.

However, such an operational definition may fulfil the vital need for conceptual clarity while still allowing the flexibility for the term community to be applied. To support this, we would cite the words by Sullivan (2003, p. 22) – *"Obviously, such a means of classifying a community is a qualitative and possibly oversimplified model of community analysis. Nevertheless, as will be shown, it can serve as an effective mechanism for describing a community's likely pattern of recovery. Hence, the following discussion will focus on how these criteria can apply in terms of their broad implications for communities, particularly recovery"*.

We believe that by utilising this qualitative model, experts can map the variety of communities they perceive in a practical and visual way. This in turn could facilitate an appreciation of the different communities, what dimensions define them and how well established they are, ultimately leading to a great understanding of local social dynamics, engagement strategies, tools and communication channels. Finally, we stress that this model would require further testing and refinement in practice examples. We welcome other experts at all levels to build upon this essential and valuable work.

DPM

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