

Increasing the Collective Impact of Climate Action with Participatory Community Network Mapping

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Introduction

All over the world, organizations are gearing up to address the causes and effects of climate change. However, none of them can do this on their own. Joining forces is essential.

The 2015 Paris Agreement¹ was a major milestone in accelerating this process of global collaboration:

The Paris Agreement builds upon the Convention and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so. As such, it charts a new course in the global climate effort.

Although the intentions in Paris were good, there is still monumental confusion and dithering about what exactly needs to be done, in what way, when, and by whom. Part of this has to do with the political inertia resulting from economic, psychological and intergenerational issues caused by passing the buck.² Apart from political will (or lack thereof), there is also another complicating factor contributing to inaction. Climate change is a *wicked problem*, meaning the problem and its possible solutions are fuzzy and open-ended, and there is little collective understanding about which stakeholders should be involved.³ On the one hand, a plethora of inspiring, concrete initiatives is emerging worldwide and is helping inspire thinking and acting. On the other hand, as such challenges are so immense and urgent, they cannot be solved by scattered, isolated initiatives. It is necessary to implement multi-stakeholder collaborations working together towards collective impact, jointly defining the problem in all its complexity, and collaborating on developing, implementing and evaluating multi-faceted solutions.⁴ To make these solutions truly impactful, collaborations need to be scalable and evolving, focussing on systems and policy change, and be committed to by a myriad of societal stakeholders. In short, we need a "mass mobilization larger than any in history".⁵ Only then can the massive transformation of the global political and economic order take place that is required to reach measurable collective impact in time.

As Bargués-Pedreny and colleagues argue, in today's world of complexity, emergence and unknowability digitally-supported mapping can help formulate alternative political visions. It does so by representing the relations and interactions of the entities subject to policy intervention.⁶ In classical geography, geographical maps traditionally took centre stage. Another major category concerns network maps. Whereas *geomaps* locate organisations within a representation of the physical environment, *netmaps* show the inter-relationships between organisations, individuals, ideas and so on within an abstract space.⁷

In this article, I examine a case study in which one form of network mapping - participatory community network mapping - was used by a group of us to visualize and help discover

common collaborative ground between stakeholders in a climate action coalition of Dutch participants from multiple sectors of society. After introducing the 2018 Dutch Klimaatstroom Zuid Climate Summit case, I discuss how the *CommunitySensor* methodology for participatory community network mapping can help facilitate discovering collaborative common ground in such complex networks.⁸ I show how *CommunitySensor* was applied to the climate summit case, and then discuss how participatory mapping could help the process of common agenda setting with collective impacts in mind.

Case: The 2018 Dutch Climate Summit

In early 2018, several organisations in the southern Netherlands, including the Province of North Brabant, the Brabantse Delta regional water authority, the provincial future studies institute BrabantKennis and the municipality of Breda, were thinking about how to catalyse climate action with collective impact. They decided that to effectively address their share of the Paris Agreement goals they needed to launch a collaborative movement involving organisations in the three southern Dutch provinces of Zeeland, Noord-Brabant and Limburg. They called this collective Klimaatstroom Zuid⁹ ('Climate Flow South', Figure 1).



Figure 1: The Klimaatstroom Zuid movement¹⁰

From the Klimaatstroom Zuid manifesto:¹¹

Collaborating with Concrete Goals in Mind: Every stakeholder has its own responsibility, while at the same time we need to work collectively. We can succeed by working together with concrete goals in mind. The will is there. What matters is that solutions are realized across the boundaries of individual organisations and sectors.

To kick-off this climate movement of initiatives, in June 2018 a climate summit was organized in the former Breda domed prison,¹² a fitting location for policy and decision makers plotting their way to escape from the global governance system that keeps us all trapped in climate inaction (Figure 2).

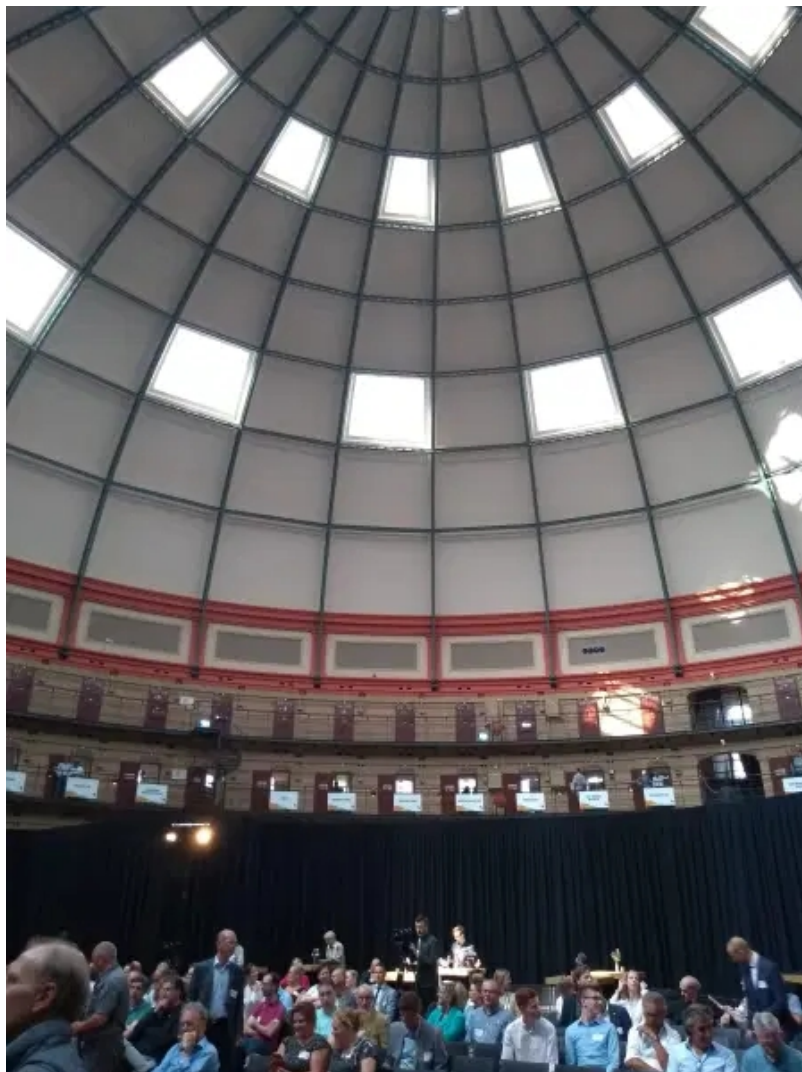


Figure 2: The 2018 Climate Summit

Continuing from the manifesto:

Translate “together” into concrete actions: The manifesto is not a goal in itself. It is

part of a movement towards more attention for the climate in the southern Netherlands. Furthermore, there is a connection with the national climate ambitions. To translate those ambitions into a concrete action perspective, we organize a climate summit of and for the Southern Netherlands on June 4, 2018. We bring together existing initiatives to accelerate and bundle them, and also to connect them with the process of the National Climate Agreement. We determine how we will realize the further ambitions and specify the desired transition paths for the various sectors. In this way, we will arrive at concrete implementation plans with measurable results.

Representatives from over 80 governmental agencies, 100 non-governmental organisations, and 130 companies participated in the conference, not only symbolically, but also concretely in so-called working arenas. This far exceeded our expectations.

Selected stakeholder representatives entering these arenas had the explicit goal of producing draft agreements for specific combinations of climate themes and the domains and sectors in which the action was to take place, as starting points for future collaborations. Following the classification of the National Climate Agreement negotiations, representatives were asked to focus on drafting agreements based on the themes of *Energy*, *Climate Adaptation*, and *Circular Economy*, within the domains and sectors of *Electricity*, *Built Environment*, *Industry*, *Agriculture and Rural Areas*, and *Mobility and Logistics*. At the end of the day, the draft agreements were symbolically presented to top government officials responsible for climate action (Figure 3).

Given the urgency of the climate issues at stake, the momentum that had been building, as well as the considerable resources already invested in getting this far, the overarching question was how to go about unlocking and catalysing the potential of this emerging climate action movement?



Figure 3: Presentation of the draft agreements

Discovering Collaborative Common Ground in Budding Climate Coalitions

How to transform the nascent, fragmented climate change coalitions of the willing into effective and scalable collaborative networks with collective impact? The stakeholders participating in Klimaatstroom Zuid were already engaged in numerous local, regional, provincial, national, and international initiatives, each with their own goals, interests, governance procedures and collaborative culture. There was no overarching hierarchy that could direct everybody into the same direction, nor would that have even been possible or desirable. The complexity and scale of the climate mitigation and adaptation challenges ahead, as well as the many divergent, often contradictory organisational interests were significant and sometimes necessary barriers in this respect.

Formal (inter)governmental frameworks and directives remain crucial to legitimise and enforce the boundaries set and crossed in the collaboration between societal stakeholders. However, within the limits defined by those political boundaries, we need a different paradigm to provide the necessary alignment and coordination. Instead of centralized, forced integration of climate change initiatives, we should work on *smart scaling* of initiatives through common agenda setting. This means identifying conceptual and actionable common ground between existing initiatives, weaving ever more meaningful connections between them, and identifying collaboration gaps that can be filled by new initiatives.¹³ A light and agile form of alignment of initiatives is necessary, partially integrating them only where useful and feasible. In other words, in line with the emerging paradigm of seeing society as a fractal composite of communities, open systems for the distribution of governance are required.¹⁴ To support this form of distributed governance requires strengthening *collective intelligence*: the synergistic and cumulative channelling of the vast human and technical resources now available over the internet to address systemic [wicked] problems such as climate change.¹⁵

Malone and Klein presented a (hypothetical) form of collective intelligence combining the smart use of online argumentation systems, computer simulations, and collective decision-making tools to support more effective climate action and coalition building. In the Klimaatstroom Zuid case, we applied a differently mediated approach to amplify collective intelligence: the CommunitySensor methodology for participatory community network mapping in combination with the Kumu¹⁶ online network visualization tool.¹⁷ Our initial aim was to apply the methodology and tool to symbolically map the collaborative connections between the initiatives represented at the summit.

The CommunitySensor methodology for participatory community network mapping

In 2017, I defined participatory community network mapping as the participatory process of capturing, visualising, and analysing community network relationships and interactions and applying the resulting insights to community network sensemaking, building, and evaluation purposes.¹⁸ I introduced the main process model of the CommunitySensor methodology - the community network development cycle - consisting of four stages: community network mapping, sensemaking, building, and evaluation (Figure 4).

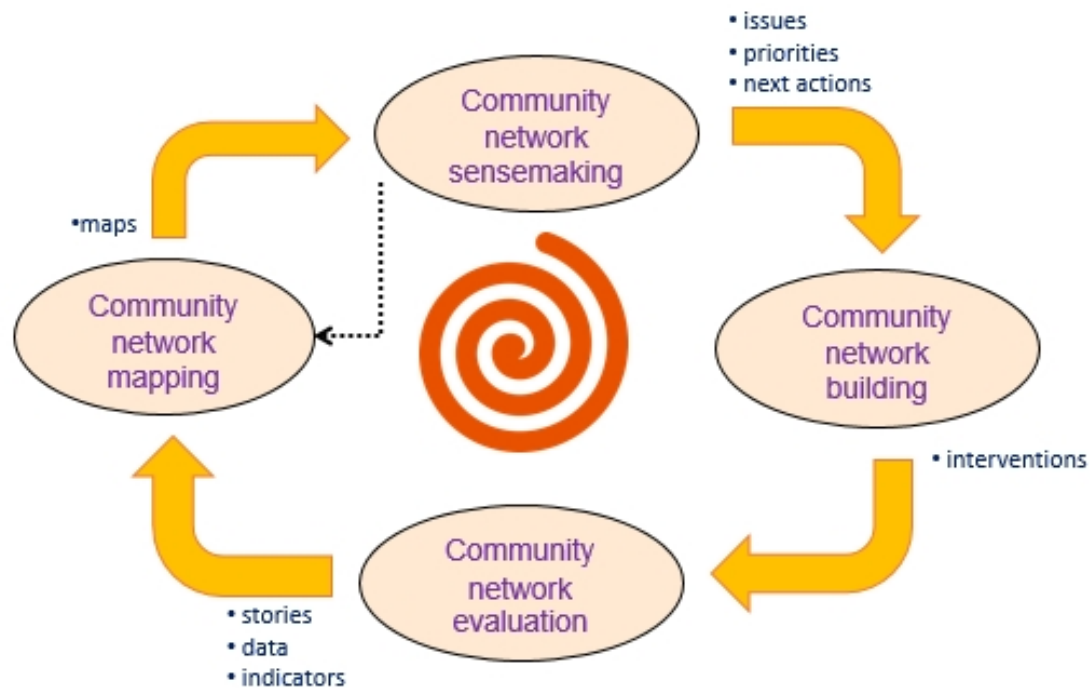


Figure 4: The CommunitySensor process model

In the *mapping* stage, community members map relevant fragments of their community networks. In the *sensemaking* stage, selected sets of stakeholders discuss and interpret those partial maps, reaching consensus on focal issues, priorities and next actions. These mapping and sensemaking processes often need to be reiterated several times in the sensemaking subcycle. The issues, priorities and next actions that are arrived at in the sensemaking stage form inputs for the subsequent community network *building* process. In the final stage, community members *evaluate* the results of those interventions, and capture essential results on the map, starting the next iteration of the cycle.

Previous cases in which the methodology was applied, from the participatory mapping of social innovation connections between major European cities,¹⁹ collaborative connections between participants in a global agricultural conference²⁰ and agricultural collaborations within and across governance levels in Malawi,²¹ had demonstrated the usefulness of such an approach. In particular, the method had shown promise to facilitate knowledge sharing and learning in scaled-up multi-stakeholder contexts dealing with wicked problems. By showing that there are already many, often hidden, collaborative links between initiatives – the *connection force* – and subsequently collectively making sense of them, the potential for achieving collective impact turns out to be much larger than one would think at first sight. By developing a visual knowledge base representing that connection force, stakeholders should, first, become aware of that hidden collaborative potential, and second, be made aware that a systematic knowledge-driven approach can help to better identify issues, priorities and next actions to address the WHAT? SO WHAT? NOW WHAT? questions in growing these complex and evolving collaboration ecosystems towards more collective impact.

In the Klimaatstroom Zuid case, our initial goals were more modest: to let the conference participants at least get some sense of the significant hidden connection force between the (seemingly) separate initiatives they represented at the summit.

Mapping the Summit: May the "Connection Force" Be Visible to Us

So how did we make visible and start to make sense of the connections between the climate initiatives submitted during the conference?

Preparation

Prior to the summit, in consultation with the summit organizers, we defined the following common *element types*, drawing both from concepts key to the National Climate Agreement negotiations taking place, and from the focal topics of the conference working arenas (Table 1):

<ul style="list-style-type: none"> • Themes <ul style="list-style-type: none"> ○ Energy ○ Climate Adaptation ○ Circular Economy
<ul style="list-style-type: none"> • Sectors <ul style="list-style-type: none"> ○ Electricity ○ Built Environment ○ Industry ○ Agriculture & Rural Areas ○ Mobility & Logistics
<ul style="list-style-type: none"> • Projects/Initiatives
<ul style="list-style-type: none"> • Organisations
<ul style="list-style-type: none"> • Locations

Table 1: Key element types used to map the Klimaatstroom Zuid summit

Admittedly, these are just rough conceptual simplifications of a messy working reality, but the categories were deemed enough by the conference organizers to sketch some of the initial outlines of potential common ground in a very complex, emerging field. Additionally, different possible connection types between these elements were also defined, for example, a project/initiative having a location, or contributing to a theme or sector.

We then configured a visual knowledge base using the Kumu visualization tool. This configuration included defining an initial set of perspectives on the collaboration ecosystem, to help focusing on potentially relevant subsets of connections. Examples of such perspectives included which stakeholders are already involved in what projects and

initiatives, what projects and initiatives contribute to which themes, and what projects and initiatives are being worked on by what sectors.

Climate Summit Day

On the summit day itself, we set up a mapping station on the periphery of the main stage (Figure 5). Interested members of the audience who wanted to register their project or initiative could fill out a simple survey – in either paper or electronic form – and submit it to the mapping team. We processed the forms on the fly, adding the data to the growing Kumu knowledge base.



Figure 5: The climate summit mapping station

Key to the philosophy behind CommunitySensor methodology is that the mapping is *not* about the maps as deliverables on their own, but about the process of *participation* of the community of stakeholders, from defining the mapping language, collecting the data, to making sense of the evolving maps and using them in their collaboration processes.

Despite the mapping event only being a side show, and the data collected forming only a very random sample of the initiatives represented by the participants, at the end of the conference, we had already put 47 projects/initiatives, 144 organisations, 37 locations, and 428 collaborative connections between them on the map (Figure 6).

We also defined more specialized and actionable perspectives, such as the collaboration contexts for the various working arenas. An example is the map representing the arena in

which decision makers were collaborating on the theme Energy and the domain/sector Built Environment.²²

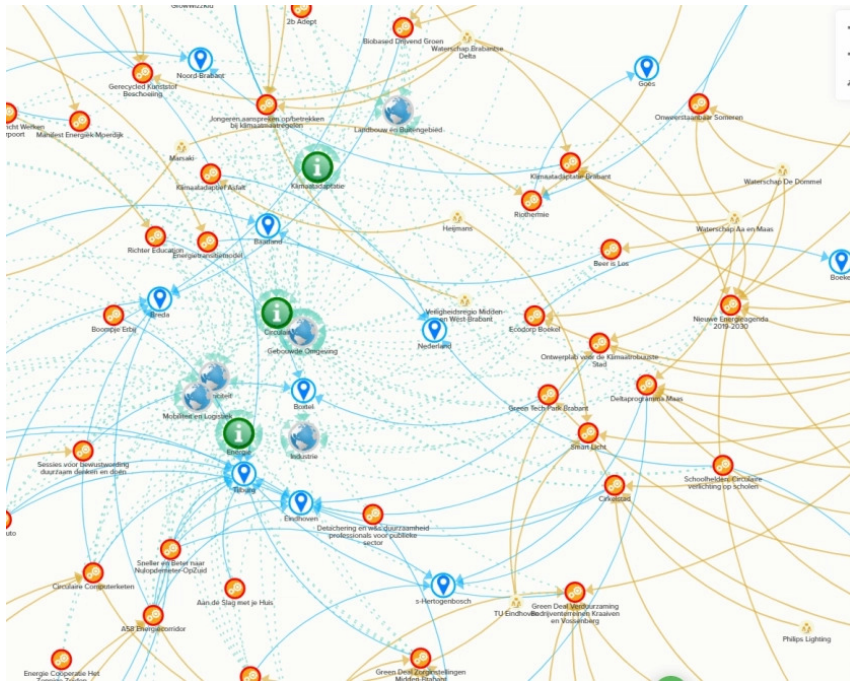


Figure 6 Excerpt of the bird’s eye view on the Klimaatstroom collaboration ecosystem

Table 2 lists some (live) perspectives on this visual knowledge base.

<p>Bird’s eye view https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem</p>
<p>Stakeholders involved in projects/initiatives https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem/betrokkenen-rond-projecten-initiatieven</p>
<p>Projects/initiatives around locations https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem/projecten-initiatieven-rond-locaties</p>
<p>Projects/initiatives contributing to themes https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem/projecten-initiatieven-rond-themas</p>
<p>Projects/initiatives contributing to domains/sectors https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem/projecten-initiatieven-rond-domeinen-sectoren</p>
<p>Projects/initiatives contributing to themes & domains/sectors https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem/projecten-initiatieven-rond-themas-en-domeinen</p>

Table 2: Some perspectives on the Klimaatstroom Zuid visual knowledge base

Although these general perspectives are good starting points for common agenda setting, there are many other ways to use the knowledge base for agenda setting purposes. For example, Figure 7 shows a customized perspective of the projects/initiatives around and between the four largest cities in the province of Noord-Brabant.²³

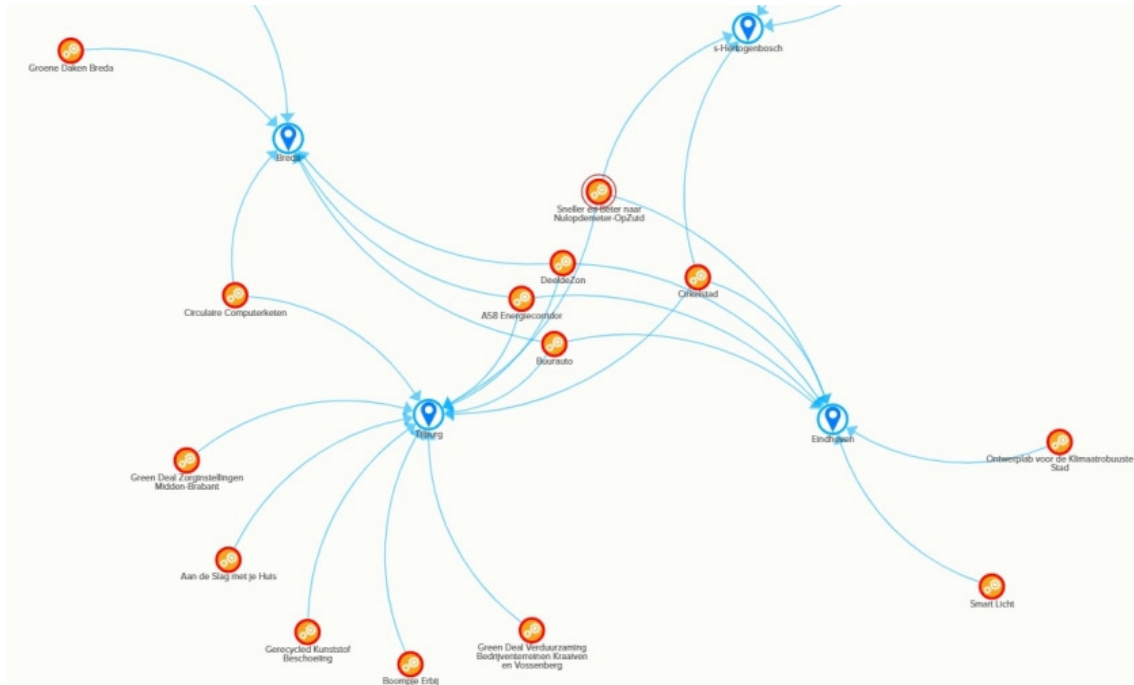


Figure 7 Climate action initiatives selected cities have in common

Still, it is important to realise that the maps as artefacts are means to an end, not goals in themselves. The map (perspectives) are meaningless without stakeholders together making sense of them: what parts are relevant for understanding one's own position in the collaboration ecosystem? How to use the map perspectives to identify new partners, opportunities for linking up existing initiatives or starting new ones? What collaboration gaps exist that are not covered yet by relevant elements or connections? How to go about triggering interventions in the real world so that their meaningful representations may be added to a future version of the map?

One way we promoted small scale sensemaking during the conference, for example, was to take interested participants on a private tour of the map at the mapping station. People were very interested in discovering the often-unknown connections around the themes, sectors or locations their organisation or project had in common with others.

We also engaged in more scaled up, collective sensemaking. Several times throughout the summit day, I, in my role as map maker, was invited to the main stage to be briefly interviewed by the conference chair in order to discuss some first impressions of the map-in-progress (see Figure 8). This, in fact, was the main outcome of the day: giving the audience a glimpse of how much (potential) common collaborative ground there already was between all their projects and initiatives, and how important it was to actively reflect upon what could be seen. Showing the connective force implicitly present between efforts which – on the (map) surface – seemed fragmented, conveyed a powerful message: reaching collective impact is not just about starting more initiatives, but also about more systematically aligning

and connecting existing efforts.



Figure 8 Making collective sense

After the summit

After the summit, the initial results were made available on the *Klimaatstroom Zuid* website.²⁴ The photo gallery gives a palpable sense of the level of participation and enthusiasm throughout the day.²⁵ The map of collaborative links between the surveyed initiatives was also included as a symbolic representation of the connective force between existing initiatives on that day.²⁶ It gives a good sense of the power there is in getting our act TOGETHER in fighting climate change.

The Climate Summit kicked off an ongoing process of climate action collaboration between a multitude of stakeholders at and between the provincial, regional, and municipal levels. There were setbacks, as it is not easy to keep the energy and focus generated during such an inspiring launch event. Setting common working agendas together requires very hard work, especially in a contentious domain like climate change and action. Still, work keeps going to find ways to scale up collaboration to the next level.

Towards Common Agenda Setting with Collective Impact

A key condition of success for having working alliances reach collective impact is to make them define (on an ongoing basis) a common agenda based on a shared vision, a common understanding of the problem and agreed upon actions.²⁷ How then are decision makers to grow impactful alliances at local, regional, national, and international levels if they are lacking a more systematic approach to common agenda setting?

By sharing our findings on the Dutch climate summit case, I hope to have given the reader a

sense of how the participatory mapping of the community networks involved could lead to more impactful climate action. Of course, as always, maps and mapping are not a panacea. There are many hurdles to overcome before the potential of such an approach may materialise. Some of them have to do with the mapping process itself, others are outside of the mappers' sphere of control and responsibility.

Concerning the mapping methodology itself, people often say that "the maps are so complex". This is true, but rather than shy away from this collaborative complexity, we should embrace it. A highly simplified snapshot of initiatives at one random regional event in the Netherlands already shows a very complex web of (potential) collaborative relations. How to ever go about untangling the knots in the numerous mutual dependencies in collaborations affected by and affecting climate actions in the global village, if not being willing to really see and understand them in the first place? An important focus of my current R&D therefore is on how to create and effectively use more meaningful conceptual and actionable perspectives on collaboration ecosystem maps. This should help stakeholders obtain deeper insights and foster better decision making about what are essential collective issues, priorities, and next actions.²⁸

Not only in network mapping, but also in the more traditional mapping disciplines of geography and cartography, a shift seems to take place from looking at maps primarily as objects to *mapping* as practice, the knowledge it deploys and its political implications.²⁹ The politics of power and empowerment has been at the heart of the mapping enterprise throughout the ages. What is to be put on (or left off) the map, who has access to the maps, and how and by whom they may be put to use, has always been at the core of power and control struggles from the very top down.³⁰ It is not as if these power aspects have suddenly gone away in our online social media-dominated sharing culture. Far from it. Online collaboration ecosystem maps and mapping make transparent who does (not) work with whom on what. In the ensuing sensemaking processes the implications of the presence/absence and quality of those collaborative relations may become clear to many new stakeholders, sometimes painfully so. Although transparency is often touted by the powers that be, it may not always be their real or perceived interest.

An overarching question, to be asked in any participatory mapping endeavour, is therefore: how can we gradually move from power to empowerment: the process by which people, organizations, and communities gain true mastery over their affairs? How can empowerment help people in taking control of their lives, developing critical awareness and knowledge about their situation, as well as developing long lasting skills and capacities to participate and shape their own environment beyond the confines of a particular project?³¹ What can the participatory mapping of community networks contribute to finding this balance between power and empowerment?

Digitally supported-mapping approaches can have real political impact by acting as an iterative and processual attempt to visualize a web of relationships aimed at problem solving. It does so through three functions: supporting contestations, governance and imaginations.³² Through *contestations*, such mapping helps to articulate critical alternatives, amplifying voices and empowering the powerless and providing alternative scenarios to top down perspectives. In *governance*, mapping helps to contextualize internal processes and policy interventions, with various degrees of radicalism. And in political *imaginaries*, mapping helps to arrive at alternative possibilities by discovering new patterns and seeing the virtual, rather than the actual, pointing at unrealised or inherent possibilities and opportunities. In the Klimaatstroom Zuid case, examples of all three functions were shimmering through. Still, we are only at the beginning of exploring the political dimensions of our work to map and make

sense of collaboration ecosystems, together with the stakeholders involved. Assemblage theory³³ and onto-cartography³⁴ seem good starting points for further analysis as these approaches take the ecological view on collaborative relations very seriously.

In initiatives applying collective intelligence for the common good, many external limitations to and factors for their success have been identified. Limitations include policy and governance factors, organizational/project management and contextual and economic factors. Success factors comprise opportunity, cultural appeal/spin and sustainability.³⁵ It should be clear that there is not one cookie-cutter approach to using participatory mapping approaches in such contexts. This implies that mappers should see their methodologies, tools and techniques as only *augmenting* collective impact efforts by stakeholders who own their problems and solutions, rather than prescribing how these stakeholders should proceed with their community networking efforts. However, although the mappers' roles are more modest than they may seem, they may still be essential in unlocking and catalysing the potential connection force already present.

In the development of CommunitySensor, we will continue to experiment with and learn how to make more meaningful and actionable maps; the perspectives through which to look at them; and the interactive settings (e.g. physical and online workshops, meetings, brainstorming sessions, and seminars) in which to make sense of them. Using these methodological mapping building blocks, we hope to develop increasingly powerful - and empowering - ways to inform common agenda setting and collaborative alliance building processes. We are still only scratching the surface of what exactly are collaboration ecosystems, in particular for climate action, how to map and make sense of these networks, how to use these visualizations effectively in common agenda setting efforts and how to make sure these mapping efforts are legitimate and just. And this not only applied to high profile climate summits but also and maybe especially so in the more mundane, more invisible, but possibly even more important day to day activities on the policy making, planning, monitoring and evaluation that also need to work with the climate goals in mind.

Conclusion

I hope this article has made clear that we *must* address the collaborative complexities of climate collaboration head on. Doing so is essential if we are to jointly, timely and more effectively build the collaborative infrastructures the world so urgently needs to address the massive climate change challenges ahead and already there. I end with this passionate call to arms by Naomi Klein, from her book, *This Changes Everything*:³⁶

[A]ny attempt to rise to the climate challenge will be fruitless unless it is understood as part of a much broader battle of worldviews, a process of rebuilding and reinventing the very idea of the collective, the communal, the commons, the civil, and the civic after so many decades of attack and neglect

Those of us working on participatory community network mapping for common agenda setting have joined this struggle for rebuilding and reinventing the collective. There is no more precious time to lose by remaining stuck in avoidable collaborative ignorance.

¹ <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

² Gardiner, S. M. (2009). Saved by Disaster? Abrupt Climate Change, Political Inertia, and the Possibility of an Intergenerational Arms Race. *Journal of Social Philosophy*, 40(2), 140–162.

³ Roberts, N. (2000). Wicked Problems and Network Approaches to Resolution. *International Public Management Review*, 1(1), 1–19.

⁴ Gwynne, K., & Cairnduff, A. (2017). Applying Collective Impact to Wicked Problems in Aboriginal Health. *Metropolitan Universities*, 28(4), 115–130

⁵ Klein, N. (2015). *This Changes Everything: Capitalism Vs. The Climate*. Penguin Books, p 5.

⁶ Bargués-Pedreny, P., Chandler, D., & Simon, E. (2018). Mapping and Politics in the Digital Age: An Introduction. In P. Bargués-Pedreny, D. Chandler, & E. Simon (Eds.), *Mapping and Politics in the Digital Age*: (1–18). Routledge.

⁷ Mackie, D., & Wilcox, D. (2018). Mapping Networks. *Livingmaps Review*, 4.

⁸ I have developed the *CommunitySensor* methodology in an iterative process, inspired by inputs from multiple partners over the years. What I present here is my personal account of how it was used at the Klimaatstroom Zuid event. I wish to thank the Klimaatstroom Zuid team for their enthusiastic participation in the mapping process.

⁹ <http://www.klimaatstroomzuid.nl/>

¹⁰ The source of all figures is the author, except for Figure 8, which is Klimaatstroom Zuid.

¹¹ <https://www.klimaatstroomzuid.nl/assets/files/oproep-klimaatstroom-zuid-digitaal-1.pdf>

¹² <https://www.futuredomeevents.nl/>

¹³ De Moor, A. (2018). Common Agenda Setting through Participatory Collaboration Mapping: A Knowledge Base-Driven Approach. *Proc. of the 16th CIRN Conference, Prato, Italy, 24-26 October 2018*.

¹⁴ Graham, G. (2016). Cooperating community connections: An essay on a changing political reality. *The Journal of Community Informatics*, 12(1), 128–141.

¹⁵ Malone, T. W., & Klein, M. (2007). Harnessing Collective Intelligence to Address Global Climate Change. *Innovations, Summer 2007*, 15–26.

¹⁶ <http://kumu.io/>

¹⁷ de Moor, A. (2017). CommunitySensor: Towards a Participatory Community Network Mapping Methodology. *The Journal of Community Informatics*, 13(2):35-58; de Moor, 2018

¹⁸ de Moor, 2017

¹⁹ <https://makingcommunitysense.net/2017/05/23/discovering-common-ground-in-european-social-innovation-projects-mapping-the-boostinno-network-collaboration/>

²⁰ <https://makingcommunitysense.net/2017/09/14/mapping-the-world-the-ingenaes-global-symposium-and-learning-exchange/>

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- ²¹ <https://makingcommunitysense.net/2018/09/08/participatory-mapping-of-agricultural-collaborations-in-malawi/>
- ²² <https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem/arena-gebouwde-omgeving-energie>
- ²³ <https://kumu.io/klimaatstroomzuid/klimaattop#samenwerkingsecosysteem/projecten-initiatieven-rond-locaties?selection=bm9kZS1SV09iWEUwaSxub2RILVdGbksxS1IHLG5vZGUtMVZabmQ5dFlsbm9kZS1reUsxaGtJZw%3D%3D&focus=1>
- ²⁴ <https://www.klimaatstroomzuid.nl/klimaattop/>
- ²⁵ <https://www.klimaatstroomzuid.nl/klimaattop/fotogalerij/>
- ²⁶ <https://www.klimaatstroomzuid.nl/initiatieven/>
- ²⁷ Kania, J., & Kramer, M. (2011). Collective Impact. *Stanford Social Innovation Review*, Winter 2011, 36–41.
- ²⁸ de Moor, 2018
- ²⁹ Crampton, J. (2009). Cartography: Performative, participatory, political. *Progress in Human Geography*, 33(6), 840–848.
- ³⁰ Garfield, S. (2013). *On The Map: Why The World Looks the Way It Does*. London: Profile Books.
- ³¹ Zamenopoulos, T., Lam, B., Alexiou, K., Kelemen, M., Sousa, S. D., Moffat, S., & Phillips, M. (2019). Types, obstacles and sources of empowerment in co-design: The role of shared material objects and processes. *CoDesign*. <https://doi.org/10.1080/15710882.2019.1605383>
- ³² Bargués-Pedreny et al, 2018
- ³³ Anderson, B., Kearnes, M., McFarlane, C., & Swanton, D. (2012). On assemblages and geography. *Dialogues in Human Geography*, 2(2), 171–189.
- ³⁴ Bryant, L. (2014). *Onto-Cartography: An Ontology of Machines and Media*. Edinburgh University Press.
- ³⁵ Schuler, D., Liddo, A. D., Smith, J., & Cindio, F. D. (2018). Collective intelligence for the common good: cultivating the seeds for an intentional collaborative enterprise. *AI & Society*, 33(1), 1–13
- ³⁶ Klein, 2015, p 460.