

Collaboratively mapping alternative economies

Co-producing transformative knowledge

La cartographie collaborative des économies alternatives: co-produire une connaissance transformative

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**COLLABORATIVELY MAPPING ALTERNATIVE ECONOMIES:
CO-PRODUCING TRANSFORMATIVE KNOWLEDGE**

***LA CARTOGRAPHIE COLLABORATIVE DES
ECONOMIES ALTERNATIVES: CO-PRODUIRE UNE
CONNAISSANCE TRANSFORMATIVE***

LABAEYE ADRIEN¹

Abstract - *The goal of this article is to inform practitioners and researchers alike about the emerging practice of collaboratively mapping alternative economies. The paper draws from an inventory of over 200 maps, action research, and semi-structured interviews to explore how collaborative mapping – a practice that is largely citizen-driven – may be leveraged for the co-production of (scientific) knowledge about alternative economies. An array of real and ideal types is proposed in order to help navigate the various dimensions of collaborative mapping. Four lines of discussion are proposed: (1) what can we learn from maps when reframed as mappings – as processes? (2) How performativity may bring light to evaluating the transformational nature of knowledge derived from collaborative? (3) How does collaborative mapping offer avenues for rethinking empowerment of citizens in producing knowledge about alternative economies? And, (4) what new challenges are emerging from acknowledging digital knowledge as a commons?*

Keywords - *Alternative economies; Co-production; Action research; Knowledge commons; Digital mapping.*

Résumé - *Le but de cet article est d'informer autant les personnes de terrain que les chercheurs à propos de la cartographie collaborative appliquée dans le champ des économies alternatives. Cette étude est basée sur un inventaire de plus de 200 cartes, une recherche-action de deux ans, ainsi que des entretiens semi-directifs afin d'explorer dans quelle mesure la cartographie collaborative – une pratique largement à l'initiative des citoyens – peut être mise à profit de la co-production d'une connaissance des économies alternatives. Un éventail d'idéaux-types et de types réels est proposé afin de s'orienter à travers les diverses dimensions de la cartographie collaborative. Quatre axes de discussion sont explorés : (1) que peut-on apprendre de ces cartes lorsqu'elles sont comprise comme processus de cartographies ? (2) comment le concept de performativité permet de mieux comprendre la nature*

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transformatrice de connaissances dérivées de cartographies collaboratives ; (3) dans quelle mesure la cartographie collaborative offre des pistes de réflexion afin de repenser la question de l'agence des citoyens dans la production de connaissances au sujet des économies alternatives ; et, enfin, (4) quels nouveaux défis découlent d'une reconceptualisation de la connaissance comme un commun ?

Mots-clés - *Economies alternatives ; Co-production ; Recherche-action ; Communs de la connaissance ; Cartographie collaborative.*

INTRODUCTION

Many maps show the mushrooming of grassroots and bottom-up experiments with social and ecological goals. In parallel to mapping, a variety of research fields and concepts are emerging to describe this new reality: social innovation (Mulgan, Tucker, Ali and Sanders, 2007), grassroots innovation (Seyfang and Smith, 2007), third sector (Evers and Laville, 2004), degrowth (Schneider, Kallis and Martinez-Alier, 2010), commons-based peer production (Benkler, 2006) and commons (Bollier and Helfrich, 2012). This diversity on the ground can be described as alternative economies, i.e. processes of production, exchange, labor/compensation, finance, and consumption that are intentionally different from mainstream (capitalist) economic activity (Healy, 2009, p. 338).

In the online practice networks and communities that form around alternative economies, digital mapping is common feature. Mapping is used in a variety of ways; to display the geographic breadth of a network, to provide location-based networking resources; and sometimes to make an alternative practice possible (e.g. harvesting fruits) or catalyze local communities around an emergent theme (e.g. sharing economy). The increasing availability of open cartographic data with the establishment of OpenStreetMap on the one hand, and, of open source mapping software and user-ready applications, on the other hand, have made digital mapping very accessible and increasingly collaborative. Thus, Borowiak (2015) shows that mapping is used by the Social and Solidarity Economy networks to make their communities more visible. Beyond this pioneer work, the practice of online and collaborative mapping remains largely overlooked by academia in the context of alternative economies. While a geography of sustainability transitions emerges (Hansen and Coenen, 2015), this cross fertilization of transition theory and economic geography still largely overlooks alternative economies (Schulz and Bailey, 2014). Only very recent research has investigated their spatial diffusion arguing that it is a key step in order to formulate arguments about the emergence and development of alternative economies in different places (Feola and Butt, 2015). Thus, in their spatial analysis of the Transition Town Network and Solidarity Purchasing Groups, Feola and Butt (2015) relied on data available on the website of the related networks. Beyond that example, very few researchers have seized the opportunity of using such maps as data source, and, even less, to acknowledge them as sources of knowledge in their own right. As a result,

academic knowledge on the alternative economies and the co-production of knowledge remains underdeveloped. This article attempts to fill that void.

The Transformap collective, formed in 2014 by activists, mappers, and researchers, in which I participated, identified over 200 maps of alternative economies. What do those maps look like? What information do they provide? How are they produced? Who is producing them? What is the role of digital equipment or particular online collaborative technology in these projects? I answer these questions by presenting stylized results of the Transformap inventory, informed by documentary research, situational knowledge, and interviews with map makers. This description of an emerging phenomenon – collaborative mapping – may provide answers to practitioners and scientists who wonder how collaborative mapping may be leveraged for the co-production of knowledge about alternative economies. I proceed to discuss these findings within an interdisciplinary context drawing from sustainability science, sustainability transitions, and economic geography, as well as studies of citizens science that investigates how digital equipment transforms the way we produce knowledge. Four lines of discussion are explored: (1) what can we learn from maps when reframed as mappings? (2) How does the concept of performativity bring light to evaluating the transformational nature of knowledge derived from mappings? (3) How does collaborative mapping offer avenues for rethinking citizen empowerment in producing knowledge about alternative economies? And, (4) what new challenges are emerging from acknowledging digital knowledge as a commons?

1. MATERIALS AND METHODS

1.1. Materials

This article builds upon action research started in March 2014 when I joined a call by commons activist Silke Helfrich to make a map of all alternative economies². We formed a collective later called Transformap with the mission³ to facilitate the networking – both technically and socially – of existing mappings of alternative economies (solidarity economy, [urban] commons, degrowth, social and grassroots innovation, etc.). During this process of collaborative knowledge production I was one of a handful of participants who collected and sorted existing mapping initiatives. The result was an atlas of 218 examples of working maps (as of August 18th 2016) that reflect various facets of alternative economies⁴.

Beginning with an online spreadsheet, this collection of maps later took the form of an online wiki with semantic capabilities allowing for an open-ended and self-

² See blog post at <https://commons.blog/2013/12/13/mapping-the-alternatives-kiezmap>. Last accessed on 11/05/2016.

³ Mission statement <https://discourse.transformap.co/t/transformap-a-short-introduction/289>. Last accessed on 11/05/2016.

⁴ http://wiki.transformaps.net/wiki/Mappings_Overview, accessed on 18/08/2016.

ordering process. Criteria for collection were any mapping (ongoing or envisioned) that is related to the broad container of alternative economies, including social/grassroots innovation promoting fair and sustainable models, but also maps of social movements (e.g. Environmental Justice) and urban protest (e.g. WIRBLEIBENALLE). This inventory has been open and inclusive, and uses tags to sort selected initiatives.

During the course of 2015, ten semi-directed interviews with key participants (mostly map administrators) from grassroots mapping initiatives located in France, Germany and the USA were conducted with the objective of opening the black box of map making and maintenance to better understand the motivations and challenges of collaborative mapping. Four short reports were published on a blog⁵ to share the findings with the Transformap community at large, discussing in particular the complexity that underlies the idea of aggregating different mappings – one of the original and central idea of Transformap. These reports informed a continuous conversation on the community forum⁶ where a number of mapper activists from across the world discuss various aspects of mapping alternatives and contribute to an informal and loose process of information sharing. This online conversation was punctuated by several face-to-face meetings where participants attempted to align their vision and outline a socio-technical architecture for aggregating and interconnecting mappings of alternative economies. The results presented in this paper are an attempt to formalize the situational knowledge I derived from my participation in this two and a half years conversation.

1.2. Methods

My participation involved strategic development, grant writing, networking with potential partners, community development, facilitating community mapping experiments, and producing research briefs. These various modalities of action, while sometimes hard to isolate from one another, resonate strongly with existing literature that has outlined ideal types of roles that action researchers can adopt while taking part in local sustainability transitions processes (Wittmayer and Schöpke, 2014). Action research is seen by the diverse economies research agenda as a key method for researchers to support the enactment of marginalized economic forms and the documentation of economic diversity (Gibson-Graham and Roelvink, 2011). By taking part in a collective that aimed at bringing together existing maps of alternative economies to increase their visibility, my action research is clearly set within the framework of a performative ontological research agenda (Gibson-Graham, 2008) – an endeavor that through its description acts the existence of an alternative reality. In this

⁵ <https://transitionlab.wordpress.com/2015/06/10/field-report-summary-for-transformap-some-useful-insights/>, <https://transitionlab.wordpress.com/2015/07/19/field-report-3-maps-for-urban-foraging/>, <https://transitionlab.wordpress.com/2015/05/13/field-report-2-maps-for-sharing-mobility-diy-coops-and-brown-fields-revitalization/>, <https://transitionlab.wordpress.com/2015/04/13/field-report-1-maps-for-csa-community-gardening-and-the-solidarity-economy/>; accessed on 04/10/2016.

⁶ <https://discourse.transformap.co>

paper, I take the role of the reflective scientist, displaying and analyzing the results of our inventory and atlas – as a performative action for bringing more visibility to alternative economies, and elaborating on the practice of collaborative mapping as one technique for uncovering economic diversity.

A combination of real types and ideal types is proposed. They were designed by outlining criteria that emerged during two years of action research. These types are *not* rooted in statistical analysis; they are explorative stylized facts that may require further statistical validation and are designed to help the reader to approach the practice of collaborative mapping. They serve as a concrete basis for the discussion that ensues. The three-pronged approach proposed – products, processes, producers – derives from informal exchanges with map practitioners on the best way to describe the rich practice of collaborative mapping. It reflects the fact that research interest in the field of cartography has shifted from the map as *object* to mapping as a *practice* (Crampton, 2009). It is also influenced by the commons literature and its recurring tendency to distinguish three analytical levels: the resource (the commons), the rules to govern its use (the commoning practice), and the community/users (the commoners) (Urban Research Group, 2015).

Real types of products (i.e. specific maps) displaying a typical combination of criteria were picked up and tested against the rest of Transformap's inventory of maps to ensure they were representative of the sample. Three representative real-types are extensively presented, while others, more marginal, are briefly introduced. Ideal-types of processes and producers are based on the stylistic exaggeration of one characteristic feature to stress the most common elements encountered in our collective exploration of collaborative mapping.

2. LITERATURE REVIEW

2.1. Mapping and performativity

A central concern of this paper is the transformative character of knowledge. To approach this point, it is of value to also understand the concept of alternative economies as “an alternative representation of economy as a heterogeneous and proliferative social space” (Healy, 2009, p. 338). This perspective seeks to deconstruct a binary view of the economy where the capitalist economy is the dominant form of economic life and non-capitalism is nothing more than idealistic, inferior or powerless (Gibson-Graham and Roelvink, 2011). By displacing this binary view of the economy and shifting to one of many capitalist and non-capitalist forms, we open up many more spaces of action without prejudging their transformative potential (Gibson-Graham and Roelvink, 2011). Gibson-Graham argues that the study of alternative economies itself is “a performative ontological project – part of bringing new economies into being – rather than a realist epistemological project of capturing and assessing existing objects” (Gibson-Graham, 2008, p. 616). Therefore, through the research process knowledge may be transformative. At an operational level, Gibson-Graham (2008) asks the

question of what tools and technologies are available to perform new economies. In spite of being rooted within the field of (economic) geography, it is only recently with Borowiak's work on Social and Solidarity Economy (2015) or earlier on with Pavlovskaya's study of multiple economies of households in Moscow (2004) that the literature on alternative economies has started considering mapping and mapping technologies.

This is not accidental. Indeed, while GIS and mapping technologies is now widespread the use of maps by geographers is in constant relative decline as has been largely described by the literature as argued by Herb et al. (2009) and Wheeler (2013). Indeed, following Harley and his postmodern critique of maps as representations of power – heavily tainted by their history of being used as means of domination – rather than objective forms of knowledge (Harley, 1989), maps are being cautiously approached in geography. However, and while they acknowledge the critique, Dodge and Perkins (2008) call geographers to reclaim the map, arguing that it is “one of [geography's] few `unique selling points” and that “maps are visual, immensely appealing, and can be rhetorically powerful” (Dodge and Perkins, 2008, p. 1273).

A major evolution in the interest for cartography is the shift from the map as an object (a representation) to mapping as a practice (Crampton, 2009). Thus, Kitchin and Dodge (2007) argued that maps are transitory, they are always *mappings*, and cartography is a processual, rather than representational, science. Similarly, Herb et al. (2009) argue that the focus of (political) geographers should be on the material practices behind the construction and use of maps. This shift towards mapping as a practice is accompanied by an increasing interest for performativity. Thus, for Crampton (2009) mapping is performative, participatory and political; which is illustrated by the development of amateur mapping from arts to political protest. While addressing the difficulty of handling multiple ontologies around the particular case of indigenous knowledge, Turnbull (2007) also reframes mapping as performative action and encourages us to look at the tension and cooperation produced by the encounter of diverging mapping approaches. From this point on, maps [of alternative economies] may be reframed as mappings which value primarily resides in their performative nature.

2.2. The ethical and political of knowledge co-production

Gibson-Graham (2008) argues that the performativity of research means that researchers also have a responsibility in carefully choosing the object of their research, and have the opportunity to enact and support economic diversity by intentionally studying marginal, hidden or emergent forms of economic life. This call for researchers to unearth unknown practices resonates in more recent pleas for a solutions-based research agenda in sustainability science (Miller et al., 2014). Such approaches are evidently not neutral in their political and social motivations, but inevitable because of the political nature of knowledge systems dealing with global change: scientists should recognize and accept their social responsibility (Cornell et al., 2013, p. 67) and become citizen scientists (Haklay, 2013). Importantly, there is growing consensus that identifying solutions involves collaborations between academics and communities who

are pursuing social and ecological well-being (Miller et al., 2014). Further, researchers should engage in the societal arenas in which sustainability problems are being tackled requiring a radical change in the way knowledge systems are structured (Cornell et al., 2013). In particular, Cornell et al. (2013) consider that sustainability scientists should collaborate openly in knowledge co-production and its translation to other actors in knowledge systems. This is echoed by Wiek et al. (2012) who suggest that advanced collaborative research settings and advances in transformational research methodologies are key directions for further developing a solutions-oriented research agenda.

Transdisciplinary research, action research and citizen science are probably the three traditions that have most contributed to collaboration and experimentation with non-academic actors in co-producing novel knowledge for sustainability (Lang et al., 2012; Wittmayer and Schöpke, 2014). Action research, in particular, is an approach to science that aims at “the transformation of power relationships in the direction of greater democracy” (Greenwood and Levin, 2007, p. 73). Hence, departing from a more traditional descriptive-analytical role, the action researcher has to deal with ethical and political challenges while facilitating real experiments (Wittmayer and Schöpke, 2014). Brandt et al. (2013) show that in spite of various levels of practitioners’ engagement, empowerment is in fact rarely realized in transdisciplinary research projects. A similar trend has been observed in the field of citizen science, with citizens often enjoying low to no agency in the process of knowledge co-production (Nascimento, Guimarães Pereira and Ghezzi, 2014). These findings are in tension with the original definition of citizen science as “a science, which assists the needs and concerns of citizens (...) [implying at the same time] a form of science developed and enacted by citizens themselves” (Irwin, 1995, ix). To highlight that dimension of power relationships in citizen science projects Haklay (2013) propose a spectrum of participation where, in its highest tier – ‘extreme citizen science’ – citizens and scientists may actually stand on equal footing, challenging the elitist conception of science where the transfer of knowledge is one directional, from the scientist to the citizen. This approach requires a new epistemological understanding of the process of scientific knowledge production. Acknowledging this new reality in their review of numerous citizen-driven practices, Nascimento et al. (2014) concur that citizen engagement “requires to accommodate practices and spaces that engage citizens in the questions that need to be investigated in order to resolve societal challenges, as well as make space for different epistemologies and ontologies with regards to knowledge production, assessment and governance.” (Nascimento et al., 2014, p. 49)

I will discuss the hypothesis that collaborative mapping is such a practice, empowering citizens (activists more precisely) to deploy and perform alternative ontologies of economic processes and interactions, and may require a new epistemological understanding.

2.3. The digital transformation of knowledge

The advent of the web 2.0, and of user-generated content in particular, gave a considerable new boost to the concept of citizen science especially in fields where data collection and/or processing are resource and time-consuming such as geography, ecology and biodiversity, natural history, biology, astronomy, genetics, epidemiology, history and archeology, etc. (Nascimento et al., 2014). In the field of cartography and Geographic Information Systems (GIS), the emergence of user-generated content gave birth to the phenomenon of Volunteered Geographic Information (VGI) (Goodchild, 2007). With VGI, information is produced by a large number of volunteer contributors and citizens function as *sensors* – in a rupture with traditionally hierarchic and professional geographic agencies. The same logics that support the existence of Wikipedia also support OpenStreetMap, the largest volunteered world map. Interestingly, Goodchild, in his landmark article *Citizens as sensors*, remarked that "the most important value of VGI may lie in what it can tell us about local activities in various geographic locations that go unnoticed by the world's media, and about life at a local level" (Goodchild, 2007, pp. 220–221). However, framing the role of citizens only as *sensors* may transpire a general attitude towards volunteers seen as agency-less chunks and bits of data in an indistinct *crowd*. In stark contrast, Nascimento et al. (2014) describe an emerging "do-it-yourself (DIY) science" in which numerous private and community-based initiatives use scientific methods alongside other forms of enquiry such as hacking and remixing to engage with techno-scientific concerns and societal challenges. As a bottom-up phenomenon, DIY science, they contend, embodies a citizen science as it was originally envisioned by Irwin (1995).

The combination of higher average levels of education, the availability of digital communication technologies and open access information is opening up the process of knowledge production (Haklay, 2013; Shirky, 2009). Nevertheless, (sustainability) science still needs to consider how Information Communication Technology (ICT) transforms the production, diffusion and use of knowledge in responding to societal problems (Cornell et al. 2013). Further, it may benefit from acknowledging the influence of the Internet as "a device of complexity" that shapes the meanings people assign to the world (Paradiso, 2011, p. 52). In fact, what sustainability scholars and many economic geographers still largely overlook is increasingly being addressed in other disciplines around the concept of commons:

"One of the critical factors of digital knowledge is the 'hyperchange' of technologies and social networks that affects every aspect of how knowledge is managed and governed, including how it is generated, stored, and preserved" (Hess and Ostrom, 2007, p. 9).

Hess and Ostrom (2007), argued that digital technologies redefine knowledge as a commons, meaning, as a resource shared by a group of people that is vulnerable to social dilemmas (Hess and Ostrom, 2007, p. 3).

Understanding knowledge as a commons offers a new lens for considering the question of ownership in the process of knowledge production and its outcomes.

Especially considering the role of digital technology and the way it affects collective action. In that regard, the study of online collaborative mapping cannot ignore the major role played by free licenses – allowing anyone to copy, modify, and distribute a piece of information – in enabling the collaboration needed for the development of digital commons such as open source software (Schweik and English, 2012). Less obvious and rarely addressed, online collaboration and the co-production of commons also needs shared communication infrastructure (Fuster Morell, 2014). Often such collaboration infrastructure is provided by mega-projects like Google (Paradiso, 2011) and other commercial entities such as in the case of open source software (Schweik and English, 2013), or photo sharing (Fuster Morell, 2014). However, the collaboration infrastructure itself can also be provided as a commons such as in the case of Wikipedia or OpenStreetMaps (Frischmann, 2012; Fuster Morell, 2014). As for Fuster Morell (2014), infrastructure is not neutral for collective action: it shapes the community and the resource and raises the question of how far (or whether) the two can be detached from one another as it is usually assumed by the commons literature⁷.

This leads to the formulation of the hypothesis that licenses and infrastructure provision do play a central role in defining how mappings of alternative economies unfold.

3. RESULTS

3.1. Atlas overview

Geographic coverage	Count of maps	Geographic coverage	Count of maps
World	30	Sub-national region	7
Continental region	11	Texas	2
Europe	8	Bretagne	1
Americas	3	...	
Country	116	City	50
Germany	24	Berlin	11
France	16	Hamburg	3
USA	16	Athens	2
United Kingdom	14	Barcelona	2
Austria	12	...	
...		Neighbourhood	2
TOTAL			216

Table 1: Counts of maps for various geographical coverages⁸.

⁷ See the use of the Institutional Analysis and Development framework as in Ostrom (1990), Hess and Ostrom (2007), or Schweik (2013).

⁸ Source: <https://wiki.transformaps.net/wiki/User:Adrien>, accessed on 18/08/2016.

As a preliminary remark, it is worthwhile to note that the data collection is clearly biased towards maps covering Germany (26), France (16), USA (16), UK (14), Austria (12) and the city of Berlin (11) due to the localization of most of the (citizen) researchers and their languages skills (German, English, French, Spanish).

In its census the Transformap collective systematically indicated the geographical coverage of the map. Taken together, country and city-wide maps represent three-quarter of the sample. It is of interest to observe that maps are easily scalable to the country level: indeed, once set up, digital mapping tools do not limit geographically the expansion of the map. Language, however, is a key constraint in defining the geographic spread of a map. That said, city-level maps are not necessarily a first step towards a country-level map. Often the motivation of the actors behind such cartography is to use mapping as a catalyst for assembling a local community.

Label	Count
Geographical scale	
<u>Local</u>	4
<u>Neighbourhood</u>	4
<u>Regional</u>	3
Contested and normative concepts	
<u>Commons</u>	13
<u>Sharing</u>	12
<u>Sustainability</u>	10
<u>System-wide change</u>	10
<u>Collaborative Economy</u>	9
<u>Sustainable consumption</u>	4
<u>Transition</u>	4
...	
Generic themes	
<u>Food</u>	15
<u>Land</u>	9
<u>Vacancy</u>	8
<u>Education</u>	6
<u>Energy</u>	5
<u>Local Food</u>	5
<u>Community</u>	4
<u>Ecology</u>	4
<u>Participation</u>	4
<u>Refugees</u>	4
<u>Trees</u>	4
...	

Identified practices	
<u>Urban foraging</u>	18
<u>Community gardening</u>	10
<u>Community supported Agriculture</u>	8
<u>Edible landscape</u>	6
<u>Urban Gardening</u>	5
<u>Coop</u>	4
<u>Recycling</u>	4
<u>Repair</u>	4
...	

Table 2: Thematic coverage around four broad clusters.

In order to gain a better understanding of what the maps inventoried in the atlas are about, their thematic coverage is presented in Table 2. To ease the navigation of those tags, four clusters have been arbitrarily delineated for this paper: generic themes (e.g. Food, Education, Land, etc.), normative and contested concepts (e.g. Sharing, Commons, etc.), identified practices (e.g. Community gardening, Urban foraging, CSAs, etc.), and geographic scales (Local, Neighborhood, etc.). It seems not valuable to draw further conclusions from the analysis of thematic coverage due to the fact that the collection of data and its tagging happened in an organic way, not following strict scientific methods. Nevertheless it may give a good indication of what subjects are covered by these maps.

3.2. Real types of map products

In order to navigate the diversity of maps, three real types are proposed: these cases have been selected for one or two key characteristics that clearly distinguish different map types. Those three real types cover 73% of the atlas entries. The remaining are more marginal types or cases briefly presented in a fourth subsection. Using real types instead of ideal types allows the presentation of existing maps making it more concrete for the observer.

3.2.1. The map directory: Map of urban gardens in Germany

*Gärten im Überblick*⁹ is a map of over 560 urban gardens across Germany. It provides addresses, contact details, and a description for each initiative. It is maintained by the non-profit association *Anstiftung und Ertomis* that collects data and keeps it up to date to facilitate a large gardening network. It distinguishes between three types of gardens: those in project, community gardens, and intercultural gardens. The map is known as a key networking resource among people involved in urban gardening. Data is strongly curated (no crowd-sourcing as such) and exclusively focused on one well-identified practice: urban gardening.

⁹ <http://anstiftung.de/urbane-gaerten/gaerten-im-ueberblick>, accessed 05/08/2016.

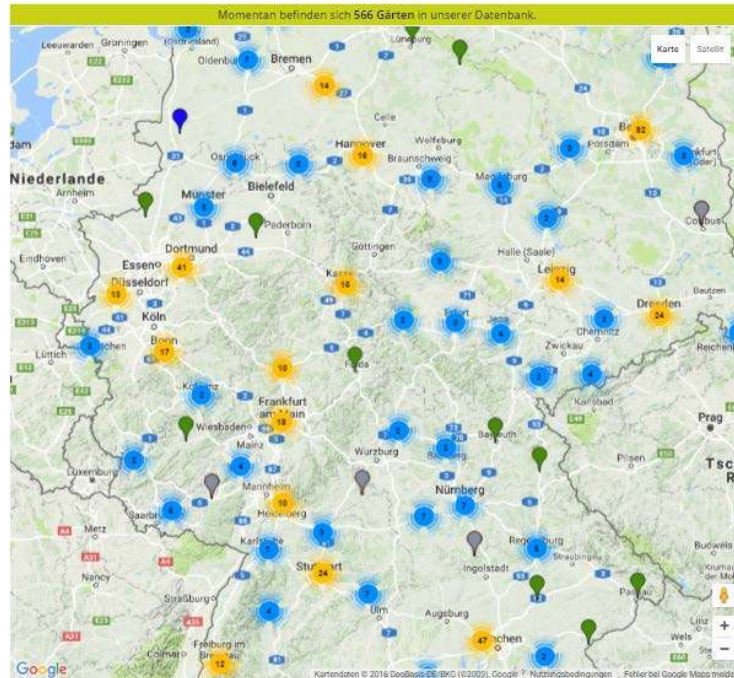


Figure 1: Screenshot of Gärten im Überblick, the German map of urban gardens.

This real type is characterized by the fact that it is a list of initiatives belonging to one clearly defined practice or network. In these directories, inclusion of additional entries is straightforward and usually controlled for compliance by one or more administrators against a clear-cut criterion: e.g. be an urban garden, or, be a member of Transition Network¹⁰. With 78 occurrences (36%), such map directories are the most common type encountered in our atlas. They focus mostly on a national scale or larger territories. Mappers and communities of practice explain the popularity of such maps because they improve the visibility of a practice, demonstrate the geographical scope of a network, and also support indirect networking among initiatives. Such directories sometimes do not even involve a map, but are strictly similar in the constant effort of data curation they require.

As a directory the map value comes from it being up to date: those maps are really mappings – processual endeavors. While data is generally closely curated by administrators, in some seldom cases, like the list of hackerspaces¹¹, data is completely crowdsourced thanks to a mediawiki¹². In such cases, curation – i.e. the selection, preservation, maintenance, collection and archiving of data – is done by the community

¹⁰ <https://transitionnetwork.org/map>, accessed 05/08/2016.

¹¹ https://wiki.hackerspaces.org/List_of_Hacker_Spaces, accessed 05/08/2016.

¹² A mediawiki, in that case a semantic mediawiki, is a specific open source software enabling wiki such as Wikipedia.

of wiki contributors including administrators with higher editing rights. It is notable that the *map directory* includes generally few categories as it focuses on one single practice or one defined network of initiatives, and therefore covers a homogeneous population.

3.2.2. The map with loose boundaries: *Leipzig im Wandel*

Leipzig im Wandel is a local mapping of over 40 initiatives that are presented along 9 main categories constituent of a sustainability transition. It is designed to substantiate and promote the moving concept of *transition* (*Wandel* in German) in the German city, but also, by presenting initiatives together, increase networking among very diverse initiatives. The mapping is a project of two local organizations: Local Agenda 21 Leipzig and Transition Town Leipzig. Local initiatives are encouraged to create an online profile to submit their information to the map. The only purely objective criterion a new entry has to fulfil is to be located in the city; whether it contributes to sustainable development is left to the appreciation of the map administrator.

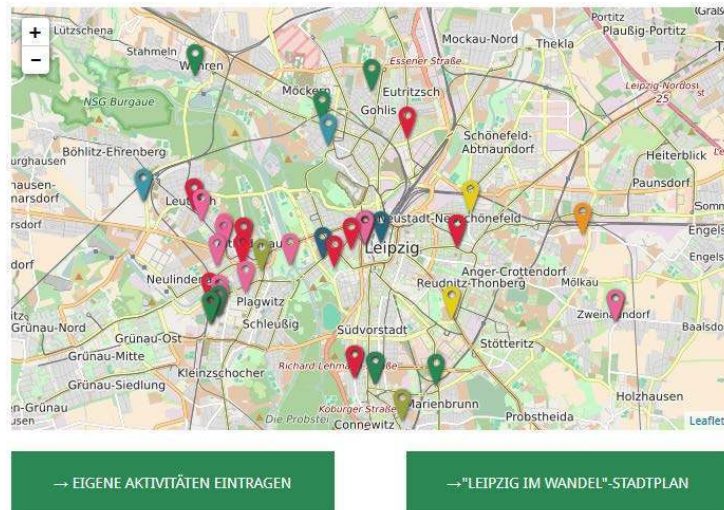


Figure 2: Screenshot of the 'Leipzig in transition' map (attribution to OpenStreetMap is missing).

This real type is characterized by a map list of initiatives that are described by an overarching concept from which clear cut criteria cannot be (or are not) derived to determine what belongs on the map. The map type has loose boundaries and inclusion varies from either completely open or an arbitrary decision from a map administrator. This real type is found 45 times (21%) in the atlas. These maps, in contrast with the *directory* real type, generally display an aggregate of diverse objects, with the aim of substantiating a moving or normative concept (e.g. transition, commons, or collaborative economy) across a given geographic area. These maps are utilized by individuals and organizations that are attempting to make various practices or networks converge by developing a collective identity.

For other mapping that fall under this real type, collection and maintenance of data is generally up to the crowd who can add new points or edit existing ones, the level of control by the map provider varies a lot. Some mappings like Karte Von Morgen¹³ or Imagination.social¹⁴ let anyone add a new entry when others like the Colibris¹⁵ movement curate the edits made by the crowd, and others such as I-Share¹⁶ require creating an account and logging in. Others, like the map of Tokyo New Urban Commons¹⁷ do not provide any opportunity for participation. Generally, the crowd is not involved in the process of developing categories to order the initiatives, this is done by the publishers of the map. Nevertheless, the example of Collporterre's map¹⁸ of collaborative consumption in the Bretagne region in France shows that this framing process may take the form of several workshops engaging stakeholders. In that case the mapping process was initiated and designed as an action research study, and the resulting map is a research outcome. Map jams are another way to kick start a mapping process in a participative fashion (see ideal type of digitally-mediated participatory mapping). The I-Share research mapping allowed initiatives to add the keywords (tags) they found suitable in addition to pre-determined categories. Such open-ended tagging approach allows the emergence of vocabularies from the bottom-up.

3.2.3. Maps of urban assets: 596 Acres in New York City



Figure 3: Screenshot of the Living Lots map produced by 596 Acres in NYC, USA.

¹³ <http://kartevonmorgen.org/>, accessed 05/08/2016.

¹⁴ <http://imagination.social>, accessed 05/08/2016.

¹⁵ <http://www.colibris-lemouvement.org/ensemble/acteurs-et-projets-pres-de-chez-soi>, accessed 05/08/2016.

¹⁶ <http://www.i-share-economy.org/>, accessed 05/08/2016.

¹⁷ <http://place-making.org/tnuc/>, accessed 05/08/2016.

¹⁸ <http://www.bretagne-consommation-collaborative.net/wakka.php?wiki=Carto>, accessed 05/08/2016.

Beginning in 2010, 596 Acres¹⁹ developed an accurate map of public vacant land lots in New York City (extensively) drawing upon public open data. Through the intensive work of checking, updating, and translating this rough data into actionable information that is brought to the physical locations, combined with active community organizing, the initiative has managed to spark a local movement of people who have reclaimed over 30 (at the time of writing) vacant land lots for community purposes such as community gardening. 596 Acres shows that translating crude data into actionable information and bringing it into the physical space can bridge digital divide, and turn (open) data into a strategic and civic resource for the renegotiation of public urban space; in some instances, actually promoting commoning practices of those resources (i.e. community gardening of land). This initiative has been replicated in other locations such as Philadelphia, Melbourne and Montreal²⁰.

The characteristic of this real type lies in the fact that it maps assets, vacant lots, in contrast with the two other types of mapping where points of interest consist of initiatives, organizations and the like. 16% (34 occurrences) of the sample falls under this category. Similar initiatives have used open or crowdsourced data to map public resources such as fruit trees. In its wiki, Transformap indexed 18 of those under the “Urban foraging” tag²¹. This type of map is not about representing a community or showcasing a practice, but a participative instrument for a bottom-up reconfiguration of public assets such as vacant land or edible trees. In other words, those mapping initiatives are strategic instruments in the development of commons-based alternative economies (further article in preparation).

3.2.4. Further marginal types

Other types were identified but were deemed marginal in the sample or with little value within the frame of this paper. Nevertheless, it may serve to mention some of them. 10 maps display a similar characteristic: they serve as an interface to connect individual users to each other. These are typically used for sharing items (e.g. a drilling machine, a costume...) and are well known in the field of the sharing economy; many for-profit sharing economy platforms also use maps or some form of geo-location for matching their users. Other maps in the Transformap atlas are displaying data (e.g. climate) with particular relevance to sustainability or alternative economies. Another noticeable mapping initiative is ESS Global: an effort to develop guidelines for the solidarity economy communities to streamline the way they produces maps across the world²². Their goal is to allow interoperability – instead of centralization – and shared visualizations, towards linked open data. Researchers are involved. This endeavor to use the potential of linked open data is also integrated into the location-based civic

¹⁹ <http://www.596acres.org/>, accessed 05/08/2016.

²⁰ <http://www.596acres.org/en/about/other-cities-copy/>, accessed 05/08/2016.

²¹ https://wiki.transformaps.net/wiki/Urban_foraging, accessed on 20/09/2016.

²²

http://www.ripess.eu/fileadmin/ripessEU.net/files/files/ESSglobal/ESSGlobal_memo_fiess_2011_eng.pdf, accessed on 20/09/2016.

participation platform Communecter that enables citizens to register any kind of initiatives they deem relevant²³. All data is licensed under an open license to encourage cross-use. This initiative is at an early stage of its public use, but federates multiple actors in France that have been involved in mapping grassroots initiatives. It is an important piece of open source mapping infrastructure and may be a significant source of data about local initiatives in the near future. A much simpler mapping, but nonetheless powerful, is the mash-up performed by the Berlin social movement WIR BLEIBEN ALLE: it superimposes 13 maps related to gentrification, housing vacancy, or co-housing (Figure 4)²⁴. It allows the reader to select the maps it wants to visualize, navigating through various facets of the housing problem in Berlin that each map is illustrating. Last but not least, a real type could have been described around the practice of collaborative semantic mapping. Indeed, the mapping of alternative economies always implies the (co-)definition of semantic categories to describe the complex realities that are represented in maps. While this process is more or less participative depending on the design decisions of mapping facilitators, collaborative tools for semantic mappings have recently emerged. Metamaps is one of them, allowing anyone to start, or duplicate a semantic map and engage others in the effort²⁵. Each user has the possibility to reuse existing semantic nodes from other maps resulting in networked mapping dynamics. The tool is increasingly being used by communities to explore new forms of digital collaboration and it can provide opportunities for action researchers looking for tools to engage in the participative mapping of discourses from and about alternative economies²⁶. The work of the Real Economy Lab prefigures how this can be used for investigating alternative economies²⁷.

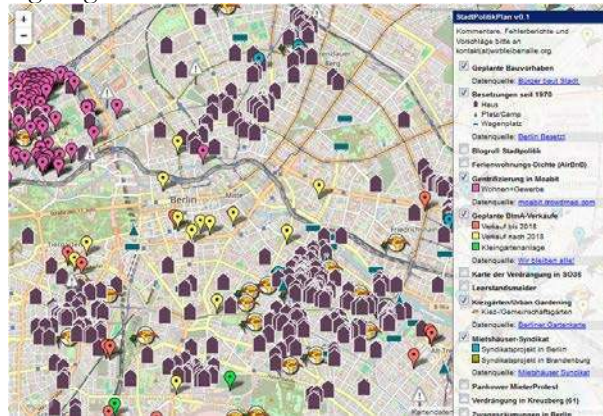


Figure 4: Screenshot of mash-up produced by Berlin anti-gentrification movement WIR BLEIBEN ALLE.

²³ <https://www.communecter.org/>, accessed on 20/09/2016.

²⁴ http://wirbleibenalle.org/?page_id=2561, accessed on 04/10/2016.

²⁵ <http://metamaps.cc>, accessed on 23/09/2016.

²⁶ For illustration, readers can have a look at a mapping of the *platform cooperativism* ecosystem that I initiated: <https://metamaps.cc/maps/1934>, accessed 07/10/2016.

²⁷ <http://realeconomylab.org/>, accessed 23/09/2016.

3.3. Ideal types of mapping processes

While interviewing mapping initiatives, but also being a participant of the Transformap collective and interacting with dozens of mappers, it became clear that there were a few distinct ways to design the process of producing and maintaining a map, in other words the mapping process. Because often, various processes may be intertwined, they are presented here as ideal types that may or may not be found in their pure state in the field. However, such mental images can help the observer navigate the seeming chaos of the field.

3.3.1. *The survey*

The survey is a traditional method for collecting data and also the most commonly used by the maps we have observed. It involves a person or an organization collecting data from initiatives in order to populate the map. Not surprisingly, the survey itself may be realized through various media: e.g. telephone, online survey tools, emails. The survey may be a one-off effort, but in the case where an organization runs it in order to produce (and maintain) a directory, it tends to be repeated over time in order to update data. Often, and especially in the case of membership directories, this updating phase is informal, with an administrator inputting data as it comes due to interaction with the initiatives.

This ideal type is facing two types of issues. On the one hand, obviously, the survey requires maintenance in order to stay up to date. Researchers sometimes produce such surveys, accumulating rich data, but do not have the resources, or interest, to follow up over time. On the other hand, surveys are top down. The respondents generally do not have much agency in the process, from the definition of scope, to the frequency of updates or in the choice of license applied to the data.

3.3.2. *Crowdsourcing*

In this ideal type the collection of data is left open to anyone (the crowd) who is willing to contribute to the mapping exercise. While data is collected by a large number of people, map ontologies (the categories structuring the data to be harvested) are defined by a smaller number of people – usually the initiators – who retain privileges in order to maintain the focus of the mapping. To be successful, the number of participants matters: usually, the more, the better the data (e.g. up-to-date). An example of such a map is Mundraub, in Germany, a map of fruit-trees where over 40,000 participants use and contribute to the map of over 24 000 points of interests (POIs)²⁸. For this mapping it is interesting to note that the initiative switched from Google products to open source mapping software (Leaflet) and data (OpenStreetMap) at the demand of the contributors.

The main dilemma with crowdsourcing is the question of data quality. Various strategies exist to deal with it. In the Mundraub case, users are often encouraged to login to improve the quality of the data edits, but this isn't a systematic practice. Other maps

²⁸ Source: <http://mundraub.org/map>, accessed on 15/09/16.

such as imagination.social²⁹ allow editing without requiring users to login as a strategy to lower the barrier to participation. In any situation administrators may also take unilateral action to remove inappropriate content such as automatic spamming. “Map defacing” as in Ballatore (2014) was not a significant issue for the maps observed, issues are more related to ensuring that new entries fit the scope of the map which is often difficult in the case of maps such as [Karte von Morgen](http://kartevonmorgen.org/)³⁰ or the [Colibris map](http://www.colibris-lemouvement.org/ensemble/pres-de-chez-vous)³¹ where it is defined in very broad and normative terms (e.g. “transformation”, “fair”, etc.). Thus, the [Colibris movement map](http://sharingberlin.de/) allows users only to suggest new entries, further filtering them.

3.3.3. Digitally mediated participatory mapping

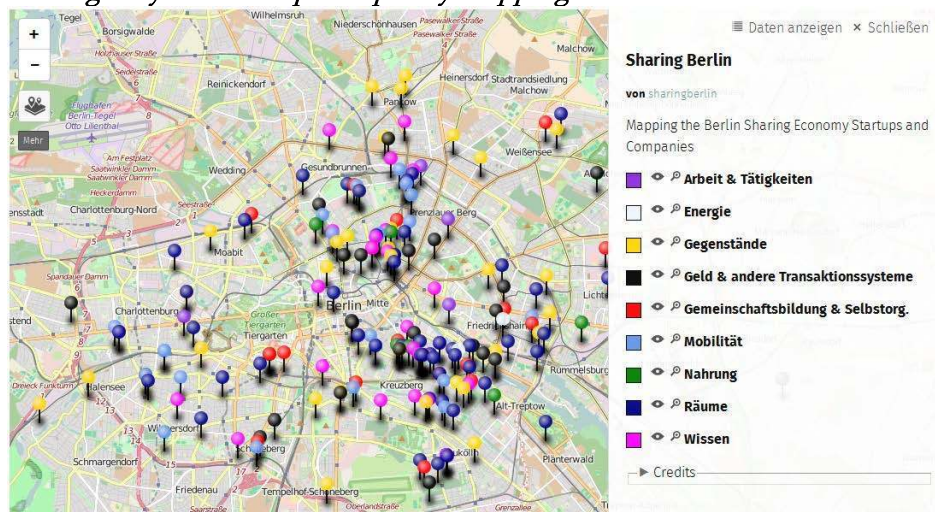


Figure 5: The Sharing Berlin map: The result of a Map Jam³².

The practice of participatory mapping has been used for a long time as a method to generate collective knowledge among specific groups through the use of cartography. Here we describe an ideal type that relies on the same dynamic, but partly mediated by digital equipment (e.g. shared spreadsheet, Google Maps, uMap, etc.). Despite digital mediation, the results of the field work show that face-to-face interaction is crucial for such processes that rely on a significant amount of exchange around the definition of the final collective product (the map), the digital tools blend with and prolong the physical meeting(s). In addition, a participatory mapping is time-bound, with only a day or two for map jams. It therefore requires facilitation and preparation. Facilitators are usually initiating the mapping, framing it, and ensuring it reaches its objectives. While facilitators of participatory mapping have traditionally been

²⁹ <http://imagination.social>, accessed on 15/09/16.

³⁰ <http://kartevonmorgen.org/>, accessed on 19/09/16.

³¹ <http://www.colibris-lemouvement.org/ensemble/pres-de-chez-vous>, accessed on 19/09/16.

³² <http://sharingberlin.de/>, accessed on 20/09/2016.

researchers, the present empirical observation shows that the method has been adopted by activists alike. In the field considered, the most representative case of this process are Shareable's Map Jams where sharing activists have collaboratively produced over 70 city maps of the sharing economy³³. The practice involves gathering activists over a day or two to co-produce a map, everyone comes with their own skills and without a blueprint. Maps jams are seen as a collective action to catalyze the sharing scene in a city or region. Results from field observations (interviews, action research) tend to confirm this effect, but further research would be needed to generalize and/or deepen those findings.

As in traditional participatory mapping, the main dilemma that occurs with this ideal type is about how much room is left by the facilitators for participants to define the scope of the exercise. What is to be mapped? Resources or initiatives? How to display the results? Which categories? Etc. This issue is well known by practitioners and researchers: the more participation, the more challenging it is to produce such a map at the end of the process. During Map Jams, the facilitators use materials prepared by Shareable, reducing the agency of individual facilitators and participants, but this makes it manageable enough for often unexperienced facilitators. Another issue lies in the follow-up. From this investigation, when participatory mappings have been facilitated by an organization, the mapping continues, being maintained and further developed. Otherwise, the map is usually slowly forgotten. In our observations, in only one occurrence (out of over 70), have such processes been a part of a (action) research project.

3.3.4. Remixing, hacking open data

The increased availability of open data creates more opportunities for mapping alternative economies. Datasets of associations, or businesses, specific features of the urban environment may be used for producing novel maps. This ideal type implies the identification of relevant datasets, and involves filtering (only subsets may be useful), refining (data may not always be accurate or sufficient), combining and enriching. In the case of Falling Fruit³⁴, activists regularly import datasets of trees, usually published by municipalities, filtered for edible sorts into a central database which is then completed by the crowd making it the largest global database of edible trees that we know of. In the case of 596 Acres, open data was built upon (verified, updated, expanded) if not hacked³⁵ and then brought into physical urban space in the form of individual signs hung on vacant lots³⁶.

³³ For a list of those maps that have not been individually added to the Transformap inventory: <http://www.shareable.net/community-maps> (Accessed on 4 August 2016). Further resources are available at <http://mapjam-shareable.nationbuilder.com/resources>.

³⁴ <http://fallingfruit.org/>, accessed on 31/10/2017.

³⁵ The data obtained via a Freedom of Information Act request was not officially open when the initiative started and it was published without express permission. Its republication in an enriched version may have sped up its release as open data by local public agencies.

³⁶ <http://www.596acres.org/en/>, accessed on 19/09/16.

One central dilemma with using open data is licensing. Aggregating datasets that are licensed under different terms can be problematic. Some licenses may not allow the publication of modified datasets. However the emergence of the Open Database License (ODbL) is technically lifting such barriers, but it was not widely used by the maps we inventoried. The second issue with this mapping process is the question of the data update. When datasets are aggregated and modified, one cannot rely on updates made by the initial publisher without a more complex synchronization setup. Unfortunately, these are not usually within the skillset and/or resource budget of grassroots organizations or small research teams.

3.4. Ideal types of (co-)producers

Similarly to mapping processes, these ideal types intend to provide abstractions to help distinguishing the different types of actors and their motivations that are key in the production of maps. Again reality may show that behind a mapping initiative are hybrids of those ideal types.

3.4.1. The practice network administrator

Many of the maps studied have been produced by an organization (formal or not) whose mission is the promotion of a specific translocal practice (e.g. community gardening, repair cafés, hacker spaces). Its motivation is to make the practice more visible to the outside, but also to serve as a networking tool for initiatives that are often far from each other. The practice network administrators rarely have mapping or data management skills. These skills are learned by doing, but mapping is not necessarily the main focus so the time invested has to pay off and usually is at odds with the priorities of the mapper activist.

3.4.2. The mapper activist

The mapper activist believes maps are a very powerful medium for the diffusion of alternative practices. S/he is fiercely defends open source software solutions as well as open data licenses; which s/he sees as an essential part of the transformation embodied by the various alternative practices that are mapped. For the mapper activist the way the map is produced is as important as the final product. S/he sometimes has difficulty being understood by other actors interested in having a map ready.

3.4.3. The researcher

Researchers are not a very visible actor in the field we observed. They usually use data from existing maps for their own purposes. In some cases, they may start their own mapping initiative and generally communicate about the map only if it serves the aim of collecting data as they rely on crowdsourcing.

3.4.4. The anonymous mapper

From the material considered, the anonymous mappers are hard to pin down. They contribute with a few entries to a map they recently discovered. Their motivation is to share initiatives they are enthusiastic about. They may never return to the map after

editing it once. They are hard to engage with, but when given the right conditions (simple interface, clear instructions) they may provide large amounts of data. They are the definition of what is commonly described as the “crowd”.

3.4.5. *The initiative holder*

Initiative holders are a coveted contributor to a map. They are those with the primary data. But, apart from cases that are commercially driven (rare in alternative economies), it is hard to provide them with the right incentives to maintain their data directly. They often see digital technologies as a burden.

3.4.6. *The action researcher*

The action researcher is the most seldom actor to be encountered. S/he sees their research as part of their object of study. They may be a PhD student who has enough time to engage in action on the ground. The action researcher is often a connector, bridging together academics and practitioners, but also different communities of practice (e.g. open source software with community supported agriculture).

4. DISCUSSION

As preliminaries one should briefly reflect on the way the practice of collaborative mapping can be documented. Indeed, I have presented it along a three-pronged approach from the practical necessity to be able to describe what type of maps exist, but also the ideal types of processes that may be involved in a mapping initiative, without forgetting the fact that people are actually running the show. That division, partly inspired by the commons literature (resource, rules, users) is problematic as it tends to suggest that there is such a thing as a finished map, a fixed representation, or a product. While the literature show the flaws in such an approach, arguing for a shift from *maps* to *mapping* that shows the processual nature of cartographic science (Herb et al., 2009; Kitchin and Dodge, 2007), but it proves somewhat unpractical for documenting real types. It has been challenging to describe existing mappings without referring to the way they are produced and maintained. The only case when talking about maps actually makes sense is when the mapping process has died out. But, in this situation the value of the map for informing the reader about alternative economies is quickly eroding as the data becomes outdated.

4.1. What can we learn from mappings of alternative economies?

Feola and Butt research on the Transition Network and buying groups (2015) is the only example I found of academics using existing maps of alternative economies for geographic analysis. They show that these can be used for understanding the spatial diffusion of grassroots innovation by documenting that cross-movements collaborations and transfers do play a greater role than expected. More research may take advantage of the data available through the numerous maps we have inventoried in the Transformap’s atlas. Map directories in particular display the greatest potential

for such work as they focus on clearly defined practices or networks (grassroots innovations) and because they are usually regularly updated. However, the lack of versioning of those maps may prove challenging for longitudinal studies. In addition, researchers should be wary about the aggregation of similar mappings, not only for traditional concerns about data comparability, but also because those mappings are often more than mere representations of existing objects, they are also ontological endeavors.

In that sense, I argue that studying those mappings may inform the research on alternative economies about emerging ontologies and vocabularies used to describe emerging forms of economic activity that may differ from those used by Google, the dominant and global device of complexity that impacts the way people assign meaning to the world (Paradiso, 2011). In addition, mappings of urban assets bring visibility to untapped public resources which can be leveraged to develop new forms of community economies. Researchers have the opportunity to spread those knowledges as suggested by Gibson-Graham (2008). The specific technique of open tagging of initiatives in crowd-sourced maps such as the I-Share mapping seems highly promising in generating vocabularies from the bottom-up that are useful in describing new economies or resources. Current technological developments such as collaborative semantic mapping and linked open vocabularies³⁷ may open significant opportunities to scale such practice as explored by Curalta et al. (2015) in the case of the Social and Solidarity Economy. On a more trivial level, the maps themselves and the taxonomies they may display are formal documents that can be used as research material, which are usually difficult to obtain from movements often more preoccupied with action on the ground than documenting the ontological foundations of their practice in formal ways.

But again, not losing sight of the fact that *maps* are really *mappings*, it may be even more interesting to explore the discursive tensions that the formalization of an ontology generated inside a community of practice or network. Similarly, and following Turnbull (2007), it may be productive to explore the tensions or cooperations that emerge when confronting divergent ontologies while for example attempting to merge two mappings. In those two cases, action research seems inevitable.

4.2. The performativity of mappings

In the literature review I argued that maps of alternative economies can be usefully reframed as mappings whose value resides in their performative nature. I argue that this reframing is indeed valuable for understanding the nature of existing mappings. While presenting the real type ‘the map with loose boundaries’ it indeed appears that mapping as a practice is used by activists to perform the existence of new economic forms or movements. Similarly, maps of urban (public) assets uncover untapped resources performing the existence and availability of that resources, and, therefore, a new field of possibility that enable new forms of collective action. In that sense, the map *creates* a new reality rather than *describes* an existing one: it is an ontological

³⁷ See <https://lov.okfn.org/dataset/lov/>, accessed on 07/10/2016.

intervention rather than epistemological. Therefore, such mappings are eminently performative and of ontological nature resonating with previous claims (Crampton, 2009), but also always transitory, relational and context-dependent (Kitchin and Dodge, 2007). Indeed, mappings of urban assets only exist because they are connected to grounded material practice, they are just (digital) means. In that sense *mappings* – and not *maps* – seems to be a particularly fitting approach, adding to the tools and techniques available for researchers involved in the ontological project of performing alternative economies (Gibson-Graham, 2008).

4.3. Collaborative mapping as an empowering knowledge practice

Calling on researchers to engage with mappings of the alternative economy cannot avoid a discussion of the ethical dimension of doing so. Indeed, I formulated the hypothesis that collaborative mapping is a practice that empowers citizens to deploy and perform alternative ontologies of economic processes and interactions, answering a key concern regarding citizen engagement in the making of science (Nascimento et al., 2014). This is important because it contrasts with a record of transdisciplinary research and citizen science that has largely failed to empower citizens (Brandt et al., 2013; Nascimento et al., 2014). The mappings that we have presented in the results are massively driven by citizen activists, with only a small if not marginal fraction being academic efforts. Now, as established in the literature review there is a call for scholars to engage with these communities (Miller et al., 2014), openly collaborate in knowledge production (Cornell et al., 2013), advance collaborative methodologies (Wiek et al., 2012), favour process-oriented knowledge production (Wittmayer and Schöpke, 2014), support the creation of diverse knowledges (Gibson-Graham, 2008), etc. Approaching existing mapping initiatives to find ways to support them, and leverage knowledge co-production seems a logical next step. But, because those mappings are performative and, above all, a space where citizens can, at last, enjoy agency in producing knowledge, action researchers should be very careful in the way they approach such mapping initiatives. Assessing previous academic efforts to use collaborative mapping of alternative economies is needed to better understand how researchers may proceed while increasing the agency of citizens in such processes and not undermining their mission. To this end, it is worth mentioning the US mapping of the Social and Solidarity Economy that mostly used surveys in collaboration with the practice networks³⁸, the I-Share mapping of the collaborative economy in Germany relying on crowdsourcing to generate vocabularies, and last but not least Collporterre's mapping of collaborative consumption in the Bretagne region that was largely based on a participatory action research process. These all display varying levels of agency for participants. Looking into existing literature may provide a further basis to evaluate the various roles researchers can take in such arenas (Wittmayer and Schöpke, 2014). Nevertheless, such work should be updated to contexts of action where digital technologies are a defining feature. Thus, scholars could use academic resources to host critical mapping infrastructure, train activists to mapping technologies making use of GIS expertise, and

³⁸ <http://solidarityeconomy.us/>, accessed on 07/10/16.

contribute to networking efforts such as Transformap that seeks to bring those mappings into a digital conversation.

4.4. The critical role of licenses and infrastructure in commoning knowledge

By framing knowledge as a commons the researcher's attention is drawn to a series of social dilemmas that may threaten knowledge (Hess and Ostrom, 2007). Time in particular shows that results are problematic and requires constantly updating maps' data. Crowdsourcing has been shown to be a potential response to this dilemma. Another dilemma is the enclosure of those knowledges that are mappings of alternative economies. It is a fact that most mappings inventoried in Transformap's atlas are not licensing their data which stands as a roadblock to reusing and building upon such knowledge. Data (and ontologies and vocabularies) therefore lives in silos. While researchers often do not care about asking authorization to use data for their analysis it may be problematic for anyone wanting to publish remixes of others mappings. Open licenses such as the Open Database License (ODbL) could address that issue in a similar way that the GNU license did for the successful development of open source software (Schweik and English, 2012). Academia in collaboration with established practitioners' organizations (e.g. Open Knowledge Foundation) could have an instrumental role in making mapping initiatives aware of good licensing practices and of its benefits to "foster an environment where new facts can survive" (Gibson-Graham, 2008, p. 629).

Last but not least, infrastructure provision is key for the practice of collaborative mapping. As shown with Map Jams, the availability of free and user-friendly mapping applications such as Google Maps, and collaborative tools such as shared spreadsheets, have made collaborative mapping accessible to laypersons. But this may come with hidden costs. As Fuster Morell (2014) emphasized, digital infrastructure is not neutral. Relying on proprietary and freemium applications may backfire as users seldom understand the Terms of Use they abide to. Indeed, exporting geo-locations that were produced by Google services to another service is not allowed. While this may not pose a problem for small grassroots initiatives, that may show problematic for larger and more systematic mappings. In addition, owning their own mapping infrastructure enables initiatives to customize it, seize new opportunities, and respond to evolving demands from communities. Thus, mappings like Mundraub or 596 Acres have developed simple social networking features embedded in their mapping platforms. With very limited financial resources, this was only possible because those initiatives rely on open source software. Similarly, by using its own instance of semantic mediawiki, the list of hacker spaces enables a distributed mapping effort that displays numerous ways to navigate the data. Again, academia may support grassroots mappings of alternative economies by lending expertise (if any) in open source solutions or supporting existing open source applications such as uMap (the alternative to Google Maps) by deploying instances on their own servers or even better supporting grassroots collectives that do so (e.g. Transformap). This would require collaboration across university departments and disciplines. This could be one step in providing collaborative (mapping) infrastructure as a commons as recommended by Fuster Morell (2014) and Frischmann (2012).

CONCLUSIONS

Looking at maps of alternative economies confirms that reframing those as mappings is a valuable approach for examining these new research objects in their complexity: as sources of data, yes, but more importantly as performative, political, and participative practices. Beyond being mere digital equipment or representational objects, the mappings we considered are also formalized alternatives ontologies that have a strong potential for performing new economies. They are therefore highly valuable to the study of alternative economies – such as urban commons – understood as a performative ontological project. This presents an opportunity to address the recognized need to open up knowledge systems in search of sustainability solutions, while at the same time opening avenues in addressing the issue of low citizen empowerment in (sustainability) science and beyond. Eventually, I argued that the commons approach – with a focus on licenses and infrastructure provision – is decisive in understanding the dynamics and challenges of digital knowledge co-production, an issue that is largely overlooked in the fields of economic geography and sustainability science.

As a closing comment, I would like to mention the fact that the Transformap collective has put together a broad, although embryonic, open source infrastructure³⁹ to enable a bottom-up convergence of mappings of alternative economies including a forum⁴⁰, a wiki-atlas⁴¹, a chat-channel⁴², online pads, an API⁴³, a map viewer⁴⁴, and a customized OpenStreetMap editor⁴⁵. A wiki was recently deployed to facilitate comparisons and match-making between ontologies/taxonomies of two or more maps of alternative economies⁴⁶. This could prove useful for exploring the tensions generated by the confrontation of different ontologies. It is also a key socio-technical component in enabling the pluralistic joint visualization of mappings that Transformap strives to perform - the convergence of alternative economies that many activists call for. I encourage researchers to join the effort, there is plenty to do!

³⁹ <https://github.com/search?utf8=%E2%9C%93&q=transformap>, accessed on 08/10/2016.

⁴⁰ <https://discourse.transformap.co/>, accessed on 08/10/2016.

⁴¹ <http://wiki.transformaps.net/>, accessed on 08/10/2016.

⁴² https://matrix.allmende.io/_matrix/client/#/room/!jxSVcUkWaKRiETPsxS:matrix.allmende.io, accessed on 08/10/2016.

⁴³ <https://github.com/TransformMap/data.transformap.co>, accessed on 08/10/2016.

⁴⁴ <http://viewer.transformap.co/>, accessed on 08/10/2016.

⁴⁵ <http://editor.transformap.co/>, accessed on 08/10/2016.

⁴⁶ https://base.transformap.co/wiki/Main_Page, accessed on 07/10/2016.

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