



Repair Cafés and Precious Plastic as translocal networks for the circular economy

Wouter Spekkink^{a,*}, Malte Rödl^{a,2}, Martin Charter^b

^a Sustainable Consumption Institute, University of Manchester, Oxford Rd, M13 9PL, Manchester, United Kingdom

^b Centre for Sustainable Design, College of Creative Arts at Farnham, Falkner Road, Farnham, Surrey, GU9 7DS, UK

ARTICLE INFO

Handling Editor: Zhifu Mi

Keywords:

Circular economy
Translocal networks
Repair
Recycling
Citizen-driven initiatives

ABSTRACT

The literature on the circular economy is dominated by visions that either disregard the role of civil society in (transitions to) a circular economy or depict civil society actors merely as passive consumers. However, there are organized citizen initiatives that align with circular economy thinking and that envision a much more active role for civil society in (transitions to) the circular economy. This paper explores Repair Cafés and Precious Plastic as two examples of such initiatives based on exploratory questionnaire surveys conducted among the associated communities, supplemented with evidence from documents from the initiatives. Repair Cafés and Precious Plastic can be understood as translocal communities that strive toward creating a circular economy through, for example, local repairing and recycling of plastic waste. This article is the first to study translocal communities in the context of a circular economy. In theory, such communities can develop transformative potential to challenge, alter and/or replace dominant institutions. This requires them to develop a critical mass, a shared identity and a political voice. The study shows that networking (and thus the development of critical mass) occurs primarily in specific countries (in the case of Repair Cafés) and not necessarily community-wide (in the case of Precious Plastic). Evidence for a shared identity does exist in both communities, although more clearly in the case of Repair Cafés. The study does not provide evidence for an explicit political voice developing in either community, although in the case of Repair Cafés, the Repair Café International Foundation does take up lobbying activities. Thus, the ingredients for transformative potential in these communities are present only to a limited extent. This study contributes to the circular economy literature by showing how civil society actors can engage with (transitions to) the circular economy through organized citizen initiatives, a phenomenon that has thus far been largely neglected in the literature on circular economies. The study also adds to the limited pool of empirical knowledge on two rapidly growing citizen initiatives toward circular economies.

1. Introduction

In the past decade, the concept of circular economy (CE) has gained importance on the agendas of academics, policy-makers and businesses (Geissdoerfer et al., 2017; Ghisellini et al., 2016; Merli et al., 2018). Various definitions of CE exist in the literature.³ The definition adopted here is that of Geissdoerfer et al. (2017), who based their definition on a systematic review of the literature on CE: “a regenerative system in which resource input and waste, emission, and energy leakage are minimized by slowing, closing, and narrowing material and energy

loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling” (p. 759). This definition highlights the philosophy that underlies the idea of CE, as well as the types of activities through which this philosophy can be put into practice.

In addition to debating the nature of the concept itself, the literature on CE has thus far focused primarily on how CE principles can, should be, or are applied in business and policy-making (Ziegler, 2019), with consumer perspectives being largely neglected in much of the literature (Kirchherr et al., 2017). In the rare mentions of consumers, they

* Corresponding author

E-mail addresses: spekkink@essb.eur.nl (W. Spekkink), malte.rodl@slu.se (M. Rödl), mcharter@uca.ac.uk (M. Charter).

¹ Present address: Department of Public Administration and Sociology, Erasmus School of Social Sciences, Erasmus University Rotterdam, Postbus 1738, 3062 PA Rotterdam, the Netherlands.

² Present address: Department of Urban and Rural Development, Swedish University of Agricultural Sciences, Box 7012, Uppsala, Sweden.

³ For an overview of definitions, see, for example Prieto-Sandoval et al. (2018). For an analysis of definitions, see Kirchherr et al. (2017).

typically play a passive role (Camacho-Otero et al., 2018). Perspectives of citizens as active agents within the CE are even rarer; thinking about circularity has thus far focused primarily on the engagement of economic actors. However, citizens can engage in activities that are relevant to CEs but that are not directly economic, such as picking up litter, beach clean-ups, and food and plastic waste initiatives. These build on individual and collective responsibility, may increase ‘quality of life’ and foster a sense of civic pride while also “slowing, closing, and narrowing material and energy loops” (Geissdoerfer et al. p. 759). Such approaches have thus far received little attention in the literature: A search on Scopus⁴ lists only 41 documents of a total of 11,200 when searching for the string “circular economy” independently.

Among the papers that we do find, there are examples of bottom-up, citizen-driven initiatives related to the philosophy and activities of CE,⁵ including waste collection organizations (Gutberlet et al., 2017), the maker movement (Unterfrauner et al., 2019), and making repairs (Gobert et al., 2021). This paper explores two initiatives that have emerged over the past decade, bringing into practice principles of CE “from the bottom up”: The Repair Cafés (RCs) as an example of repairing, and Precious Plastic (PP) as an example of recycling. These initiatives take a form similar to what Loorbach et al. (2020) refer to as ‘translocal networks’, that is, interconnected initiatives that are based on models circulated through (trans)national grassroots networks but that occur locally and become rooted in distinct local cultural contexts. Translocal networks combine apparent contradictions between (1) adopting and deploying generalized models of action in locally specific contexts and (2) being place-dependent in relation to local history, culture and institutions while at the same time being actively internationally networked (Nicolosi and Feola, 2016). Similar to translocal networks that have previously been investigated (e.g., ecovillages, renewable energy cooperatives, Transition Towns; see Loorbach et al., 2020), RCs and PP consist of individual or interconnected (in specific countries or regions), like-minded, local sustainability initiatives (Pel et al., 2020b). There are nearly 2200 RCs around the world⁶ (but they are mostly concentrated in Western Europe). RCs are meeting places where visitors and skilled volunteers repair broken products for free (one can think of clothes, furniture, electrical appliances, bicycles, crockery, toys, and so on). Precious Plastic consists of nearly 300⁷ workspaces around the world in which people recycle plastics with ‘homemade’ plastic recycling machines. In CE terms, RCs and PP workspaces are citizen-driven initiatives that exist in the open loops of companies that have produced products and/or packaging (see Fig. 1). Both initiatives have emerged relatively recently but have spread quickly across countries. However, in the CE literature, a very limited pool of knowledge on these initiatives currently exists.

To the best of our knowledge, translocal networks have not previously been studied in the specific context of CEs. Translocal networks for CE are particularly important objects of study when considering the potential role of civil society in (transitions toward) CEs for two related reasons. First, these translocal networks promote visions of the CE that are alternative to technology and market-oriented visions that currently dominate CE debates; visions in which civil society has roles that go

⁴ We used the search terms ‘TITLE-ABS-KEY (“circular economy” AND (“civil society” OR “grassroots” OR “circular society”))’. These searches were performed on August 13, 2021.

⁵ This does not mean that these initiatives self-identify as Circular Economy initiatives.

⁶ This is at the time that the survey underlying this paper was conducted (2019).

⁷ This is at the time that the survey underlying this paper was conducted (2019). On their website, Precious Plastic report that they estimate more than 1000 Precious Plastic spaces (people, groups and organizations) exist around the world (see <https://preciousplastic.com/people/global-community.html>). Our own estimate of nearly 300 is based on the number of workspaces reported on their community map.

beyond those of economic agents (i.e., consumers) and in which organized citizens make an active contribution to (a transition toward) the CE. Second, as discussed in more detail in Section 2, translocal networks, because of their translocal nature, have the ability to develop a critical mass, a shared identity and political voice that enable them to influence their institutional environment in ways that local initiatives cannot achieve alone (Pel et al., 2020a).

Thus, this paper addresses an important gap in the literature on CEs by exploring translocal citizen initiatives in the domain of CEs that have previously received little attention. This paper builds on and adds to an emerging literature on citizen engagement with circularity, which introduces ideas of a ‘circular society’ that aims “to provide an alternative framing that is going beyond growth, technology and market-based solutions” and to highlight that all societal actors need to be involved in a socioecological transformation toward circularity (Jaeger-Erben et al., 2021, p.1).

The paper continues with a conceptual discussion that makes the argument that the role of civil society is currently underdeveloped in the CE literature and introduces the concept of translocal networks as a way of enriching understanding of active citizen engagement with circularity. Section three introduces the methods and data underlying this paper. Section four offers a background on the Repair Café and Precious Plastic communities. Section five presents the findings of questionnaire surveys that were conducted among the Repair Café and Precious Plastic communities. Section six offers a discussion of the findings, and conclusions are presented in section seven.

2. Building a circular economy through translocal networks?

2.1. A role for civil society beyond a ‘role as consumers’

Although the concept of CE has recently become more prominent, it has a long history going back to the 1960s (Blomsma and Brennan, 2017) and taking inspiration from a variety of similar concepts along the way (Geissdoerfer et al., 2017). As a result, rather than a clear-cut, coherent vision, it has developed as a diverse bundle of ideas and expectations (Gregson et al., 2015). This diversity is visible not only in the academic literature but also in policy discourses (Lazarevic and Valve, 2017). Notwithstanding this diversity, a common thread in debates on the concept is the ambition to move away from linear economic models, summarized as ‘take-make-dispose’ (Gregson et al., 2015), toward circular economic models that are dominated by what Blomsma and Brennan (2017) call “material life-extending strategies” (Kirchherr et al., 2017). What is also common in CE visions is to assume that it is up to businesses to implement these strategies (e.g., in the form of circular business models), facilitated by legal frameworks put into place by policy-makers and driven by consumer demand for more sustainable products (see, e.g., Camacho-Otero et al., 2018; Johansson and Henriksson, 2020). This signals an underdeveloped view of the role of civil society, casting them as ‘user-consumers’ (Hobson, 2015, 2021), whose role is “to respond to correct labeling and price signals, produce less household waste, and participate in innovative forms of consumption” and “accepting or rejecting new and diverse business models” (Hobson and Lynch, 2016, p. 16). This view is rooted in the assumption that the transition to the CE is a matter of technological and policy-driven innovation, with market forces acting as the key drivers of change (Hobson and Lynch, 2016) and with civil society being largely at the receiving end of these changes (Johansson and Henriksson, 2020).

Consumers can indeed play an active role in bringing about change toward sustainability, for example, by “voting with their wallet”, that is, by purchasing sustainable products instead of conventional ones (Becchetti, 2012). However, realizing this potential for change through consumer action requires conscious coordination among consumers, in the absence of which consumers are more likely to continue their ‘regular’ consumption behavior (Becchetti and Cermelli, 2018). It is therefore important to also investigate the roles of civil society in which

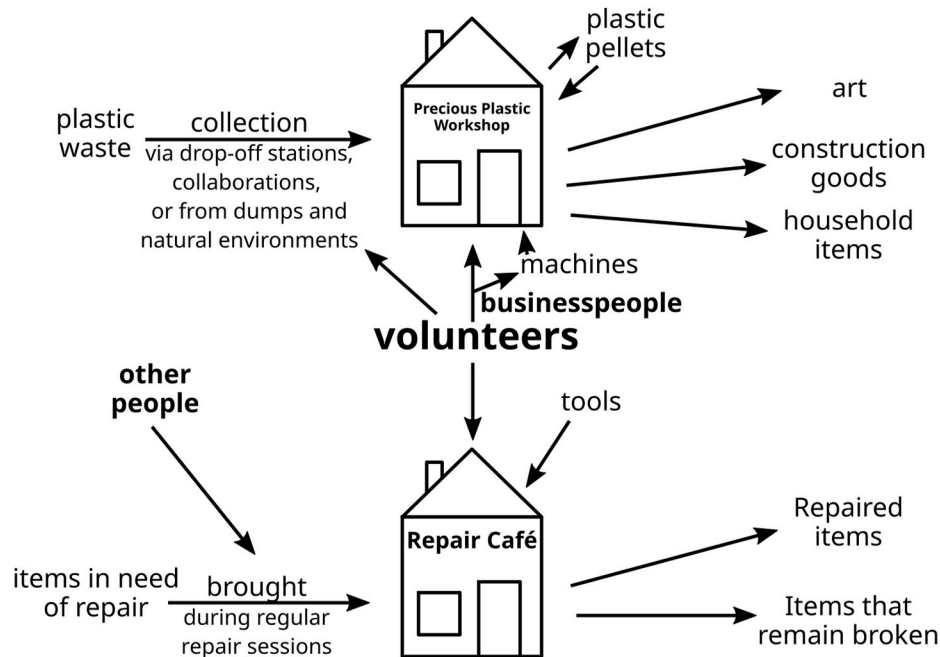


Fig. 1. Repair Cafés and Precious Plastic workspaces in the open loops of companies.

conscious coordination *does* take place in (transitions to) the CE, such as in organized citizen initiatives. Organized citizen initiatives may be complementary to consumers who “vote with their wallet” because they increase consumer awareness about the (un)sustainability of certain products and services.

Organized citizen initiatives toward sustainability have received ample attention in the literature on grassroots innovation (e.g., Gupta et al., 2003; Hossain, 2016, 2018; Seyfang and Smith, 2007; Smith et al., 2016; Smith and Seyfang, 2013), social innovation (e.g., Adams and Hess, 2010; Howaldt et al., 2018; Moulaert, 2013; Pel et al., 2016; Millard, 2018; Van der Have and Rubalcaba, 2016) and more recently in the literature on transformative innovation (e.g., Avelino et al., 2019; Loorbach et al., 2020; Pel et al., 2020b). These studies emphasize that innovations from the grassroots are different from market-driven innovations in several ways. They emphasize the pursuit of social and ecological values over economic values and focus on meeting local social needs (Seyfang and Smith, 2007). In addition, they emphasize that change toward sustainability requires not only technological innovation but also *social* innovation, which comprises new ways of doing, organizing and framing (Pel et al., 2020a). RCs, for example, are not just about repairing broken items that would otherwise be thrown away; they are also about changing the ways in which people think about and value these items (i.e., fighting a ‘culture of waste’), about sharing skills and knowledge that support this new way of thinking and valuing (i.e., repair knowledge and skills) and about changing the ways in which people relate to one another (e.g., bringing people together in ‘Cafés’). Similarly, PP workspaces are not just about preventing plastic waste by recycling plastics but also about developing a new appreciation for the value of plastic (as the name ‘Precious Plastic’ suggests), about sharing skills and knowledge that empower people to make something valuable out of plastic waste, and about envisioning ways in which people around the world can build a livelihood from this. Thus, both types of initiatives are not (just) about new ways of doing business or consuming within a CE; they are about new ways of people (and materials) relating to each other in a circular society (cf. Jaeger-Erben et al., 2021).

2.2. Transformative potential through translocal linkages

Organized citizen initiatives tend to be firmly locally rooted and

make a difference locally through concrete activities (e.g., repairing, recycling, growing food). Through these activities, the initiatives prefigure their envisioned societies in highly practical ways (Monticelli, 2018); that is, they enact new ways of doing, organizing and framing the societies that they envision. It is thus largely at the local level that organized citizen initiatives enact the social innovations they pursue. At this level, citizen initiatives also develop connections with, for example, public organizations, educational institutions, civil society organizations and NGOs, through which they can gain access to resources that they need to survive, such as accommodation, funding and legitimacy (Pel et al., 2020a).

However, when initiatives operate purely locally, it is likely that they induce only local, limited changes in particular institutions and reproduce most of their wider institutional contexts (Pel et al., 2020a). In other words, purely locally operating initiatives have limited transformative potential, that is, the potential to challenge, alter and/or replace dominant institutions, thereby contributing to “an irreversible, persistent adjustment in societal values, outlooks and behavior” (Avelino et al., 2019, p. 196). To develop stronger transformative potential, it is equally important for initiatives to develop *translocal* linkages with like-minded initiatives in other localities (Pel et al., 2020a). “Translocality means being identified with more than one location” (Oakes and Schein, 2006, p. XIII). The spread of initiatives to multiple locations often occurs through replication, which involves translating ideas, models and practices to new initiatives in new locations (Boyer, 2015, 2018). The notion of *linkages* suggests that these initiatives are also interconnected. For example, they exchange knowledge, ideas and even material resources. These linkages can come about organically or through the conscious efforts of networking organizations (Loorbach et al., 2020). Networking organizations play a role similar to what others have described as ‘grassroots intermediaries’, a role that includes helping new initiatives start in different localities (Hargreaves et al., 2013). Through translocal linkages, the initiatives may develop a form of distributed agency (Pel et al., 2020a), which allows them to bring about local changes in many localities at the same time, but translocal linkages are primarily important for the development of critical mass, shared identity and a collective political voice (Pel et al., 2020a). In this paper, a collective political voice means that initiatives together pursue a narrative of societal change, including a rationale (a problem

description and a desired future), a cast of relevant actors (working toward, acting against or being ignorant of the desired future) and ideas about developments that could lead up to the desired future (Wittmayer et al., 2019). The critical mass and shared identity that translocal networks develop makes it more likely that this political voice will gain a place in the institutional landscape (Pel et al., 2020a).

This paper explores the extent to which Repair Cafés and Precious Plastic exhibit the key characteristics of translocal networks and discusses the implications of the (potential) impact that these initiatives have on the debates related to the transition toward circular economies or circular societies.

3. Methods and data

This study identifies and further explores the goals, coordination, and structure of the RC and PP initiatives. For both initiatives, we conducted an exploratory questionnaire survey, which served as our main source of data. The questionnaire survey did not aim for statistical elaborations, as it is uncertain to what degree the samples represent their overall populations. That said, there is some level of consistency with two previously completed questionnaire surveys of RCs (see Charter and Keiller, 2014, 2016). The study was supported, supplemented, and informed by multiple informal conversations with members of the Repair Café International Foundation (RCIF) and the PP team that had formed around the initiator of PP. These informants helped to make sure that the survey questions were relevant to the community and formulated in a way that is appropriate and understandable for the target populations. This includes making suggestions for the adaptation, addition or removal of questions (e.g., removal of a question was suggested when that question was deemed irrelevant to the community by the informant in the sense that the question would not generate useful information about the community). The study was also informed and supplemented by documents and videos produced by the initiatives. Representatives of both intermediaries also provided input for and critical reflection on different versions of the questionnaire surveys. Finally, the study was informed by the third author's experience of leading the first two international RC questionnaire surveys and his field experience of being involved in RCs since 2014. This includes the establishment of a Repair Café that has organized 70 sessions at the time of writing this paper.

The two questionnaire surveys were designed to be comparable to each other, including largely similar or identical questions with a few differences related to the different foci of the initiatives. They included single-choice, multiple-choice, Likert-type, and ranking questions, plus free-text 'other' fields where appropriate. The RC questionnaire survey further included benchmarking questions for comparability with previous questionnaire surveys (Charter and Keiller, 2014, 2016), and both questionnaire surveys were amended based on input from and interests of contacts at the RCIF and the PP team. This resulted in 27 (RC) and 23 (PP) questions, respectively; the full questionnaires are reproduced in Appendices A and B. Both questionnaire surveys were trialled through small convenience samples (based on personal contacts in the RC network and an appeal on the PP forum, respectively), approved by the university's ethics committee, and rolled out from April to August 2019 (also see Table 1).

The RCIF kindly shared the RC questionnaire survey via their official mailing lists. The PP questionnaire survey was shared (by the researchers) on their forum and (by the PP team) on their social media. Due to a lack of responses, individual PP workspaces were contacted by the researchers via social media or email. In total, 303 responses were received from the RC network, and 48 were received from the PP network, which were estimated to be 14% and 16%, respectively, of the global population at that time.

Several limitations of our methods should be kept in mind while reading the remainder of our paper. First, the findings are based primarily on exploratory questionnaire surveys that only allow for

Table 1
Details about the questionnaire surveys.

	Repair Café questionnaire	Precious Plastic questionnaire
Number of questions included	27	23
Estimated population	2000	300
Estimated response rate	15% (303)	16% (48)
Methods of distribution	Mailing lists of Repair Café International Foundation	Social media pages of Precious Plastic and direct contact by researchers via social media or email.
Period when survey conducted	April to June 2019	April to August 2019

descriptive analysis. Moreover, while the questions of the questionnaire survey have relevance for an examination of translocal networks, many questions were not designed with this specific interest in mind. Second, respondents to the questionnaire surveys were assumed to represent their local initiatives. Indeed, it is possible that different people from the same initiative would have, for example, offered slightly different answers to questions on the prioritization of goals for their initiative. Third, unfortunately, the well-established Belgian RC community was not included in the RC questionnaire survey due to an administrative error in the distribution of the questionnaire survey, which leaves a significant gap in our data on RCs. Fourth, as already mentioned, the response rate to the PP questionnaire survey was rather low, which prompted an effort to approach PP workspaces directly via their social media pages or websites. Not all PP workspaces could be approached in this way and were, therefore, excluded from the questionnaire survey from the outset.

4. Background on Repair Cafés and Precious Plastic

The first RC was organized in October 2009 based on an initiative of Martine Postma, who currently leads the RCIF. It was inspired primarily by environmental concerns, as the initiator saw the issue of the lifetime extension of broken goods as a promising way to raise environmental awareness and to provide a critical lens on consumer behavior. In addition, the initiator found that repair skills were underappreciated and on the decline and saw RCs as a way to put people who still master these skills in the spotlight. The RCIF was established as the Repair Café Foundation (RCF) in March 2010.⁸ From the establishment of RCIF's predecessor in March 2010, its overall mission statement has consistently included⁹ the dual goal of (1) maintaining and spreading repair knowledge and skills and (2) performing a social function by offering people a meeting place in their local community, where everyone is welcome and can make their own valuable contribution. Since officially changing its name to RCIF in 2017, it has added the goal of promoting, spreading and protecting the RC concept to ensure the concept's international recognizability.

PP started as part of the graduation project of the initiator. Here, too, environmental motivations played a key role: The initiator observed that our societies produce large volumes of plastic each year, of which only 10% was recycled at the time. The idea for his graduation project was, therefore, to develop small-scale plastic recycling machines that people

⁸ The RCF changed its name to RCIF in 2017.

⁹ As can, for example, be seen in the publicly available annual reports of the Repair Café International Foundation.

can use to recycle plastics themselves. On their website,¹⁰ the team states that “Precious Plastic exists to reduce plastic waste”. In earlier versions of their website,¹¹ the goal was formulated as developing plastic recycling machinery together and sharing open-source and on-line designs to enable people across the world to start their own plastic recycling centers and transform plastic waste into new products.

A key characteristic of both initiatives is that, from the very early stages, there were organizations (the RCIF and the PP team) that actively contributed to the diffusion of local RCs and PP workspaces. The activities of these organizations, in both cases, are primarily funded through grants. The initiator of Precious Plastic has also been awarded funds that were invested in the further growth of the initiative. In the development of both initiatives, there is a strong role for replication (Boyer, 2015, 2018), with the RCIF and the PP team stimulating and facilitating that replication.

As mentioned previously, the predecessor to the RCIF was established as the Repair Café Foundation (RCF) in March 2010 and was focused on spreading the concept within the Netherlands. Although concrete activities toward internationalization took place as early as 2012, the Foundation was renamed RCIF in 2017, and from then on focused more on international growth of the community. To spread the concept in the early days, the RCF (the predecessor to the RCIF), among other things, provided information packages and had a Repair Bus to visit fledgling RCs in the Netherlands. Due to the exponential growth of the community (see Fig. 2), direct support to new RCs was not practical in the long term, and the bus is no longer in use. For the current-day RCIF, providing information to new RCs is still a key activity. For example, the RCIF offers a starter kit for a one-off voluntary fee. In addition to providing information, the RCIF provides forms that organizers can use to gather details about visitors and repairs, a document

with standard house rules, and promotion material. As the community grew, the RCIF started focusing more on connecting RCs in the Netherlands, for example, by organizing Repair Café days, the first of which took place in May 2012. In addition to an increased focus on internationalization since 2017, the current-day RCIF has also become more involved in lobbying activities. For example, they are part of the European branch of the Right to Repair movement, whose lobbying activities were one of the contributors to the embedding of the “Right to Repair” in European Policy¹² (Johansson, 2021). The RCIF also introduced RepairMonitor in 2017, which constitutes an attempt to gather data about products repaired by RCs in a centralized database. Reports that the RCIF has published based on data from the RepairMonitor have already led to questions being asked in the Dutch parliament on the reparability and longevity of products and the extent to which the government encourages manufacturers to ensure these qualities in their products.¹³ It is important to note that these lobbying activities are taken up by the RCIF and not by local RCs, who remain first and foremost practical initiatives. The current-day RCIF is not a membership organization but primarily aims to expand the awareness of RCs through their website, the information they provide, and their lobbying activities. However, it is still possible for Dutch RCs to register (for a fee) as members of the Dutch RC network.

The PP team had a more modest start. After the initiator of PP had released his first open-source designs, only a handful of people took it up. To make the concept accessible to a wider audience, the machines had to be improved and expanded upon, for which the initiator sought help (which he was initially able to attract with prize money that he had won with his initial designs). This was the start of the development of a small team, which has since then expanded several times, often in relation to the work that had to be invested in the development of new versions of the PP concept (later versions were generally funded with grant money). The development of new versions of the concept is also an important way in which the team has facilitated the development of the PP community. For example, the initial team of 6 people introduced version 2 of PP in March 2016, adding a fourth type of machine (the shredder) to their range of designs (also see Fig. 3).

For version 3 of the concept, a team of 10 people worked on further improvements to the recycling machines, the development of an open-source design for Precious Plastic workspaces, and the development of an online map where people involved in or interested in joining the community could connect with one another. The team also trialed various techniques to use recycled plastic as a raw material for different types of products, sharing the knowledge and experience they gained in instruction videos. Finally, they started an online bazaar where people could buy recycled products as well as recycling machines or machine parts. The development of the latest version (4) of the concept started in September 2018. For this iteration, the Precious Plastic team was expanded to 112 volunteers. The latest concept revolves around the development of the so-called Precious Plastic universe. In addition to developing improved versions of existing machines (upgrading them to a semi-industrial scale and making them safer to use) and adding a design for a sheet press, the team developed new ideas and techniques for product design, tools for the development of business plans based on the Precious Plastic concept and starter kits that people can use to begin with Precious Plastic in different ways. In this version of the concept, there was a stronger focus on the possibility of different workspaces specializing in particular aspects of the Precious Plastic concept (e.g., building machines, recycling plastic, selling recycled products). The online infrastructure of Precious Plastic was completely updated, primarily to improve the facilitation of knowledge exchange between members of the community and to facilitate people with different

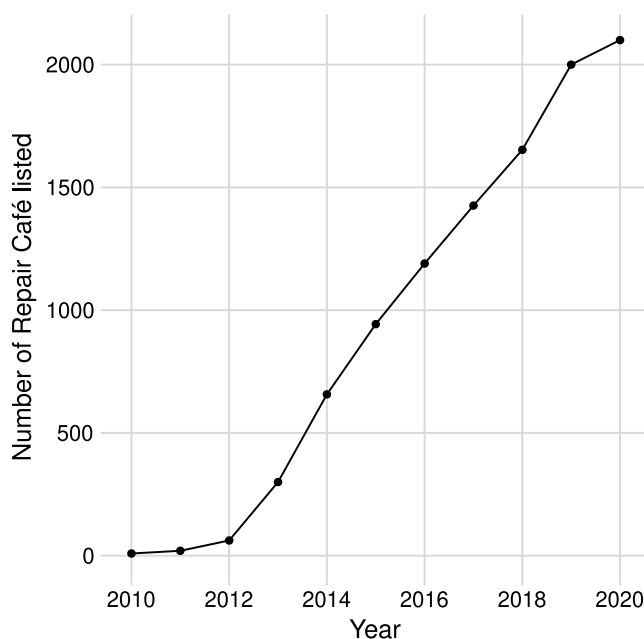


Fig. 2. Growth in number of Repair Cafés listed in the annual reports of the Repair Café (International) Foundation.

¹⁰ <https://preciousplastic.com/about/mission.html>. Consulted on June 25, 2021.

¹¹ <https://web.archive.org/web/20141230220856/http://www.preciousplastic.com:80/about/>.

¹² <https://www.ifixit.com/News/47111/european-parliament-votes-for-right-to-repair>.

¹³ <https://www.repaircafe.org/kamervragen-overrepareren-en-hergebruik/>.



Fig. 3. Photograph of Precious Plastic shredder, extrusion, injection and compression machine. Source www.preciousplastic.com, licensed under CC-BY.

specializations finding one another on the platform.

These backgrounds already point to an important insight into the extent to which the RC and PP communities operate as translocal networks. In the case of the RCs, we see that the RCIF is involved in lobbying activities, which is an indicator of an explicit political voice. However, there is no evidence that local RCs have taken up similar activities. While the RCIF has developed a political voice, that role has not been adopted by the RC community as a whole, as is discussed further below. In the case of the PP community there are no indications of an explicit political voice.

5. Findings from questionnaire surveys on Repair Cafés and Precious Plastic workspaces

5.1. A profile of Repair Cafés and Precious Plastic workspaces

Despite broad similarities between RCs and the PP initiative, their setup, intention, and structure are different (see Table 2 for a summary of key characteristics). At the core of RCs is a relationship to local communities as a location for instantaneous repairs, which, according to both RCIF data and our own questionnaire survey results, predominantly exist in Western Europe and the Global North but rarely in the Global South. The questionnaire survey results show that RCs are chiefly non commercial but often request donations to support operating costs. They tend to be hosted monthly in public buildings or occasionally in commercial venues. Since no static infrastructure is needed, RCs are usually ‘guests’ in the spaces they use (e.g., a space is gifted by a host organization or partner, or a paid-for venue is used) rather than owning a building or facility for hosting events themselves. Most events have approximately 4–20 volunteers and between 10 and 30 visitors attending.

In contrast, the questionnaire survey of PP workshops reveals that these are more varied in their setups, including commercial and semi-commercial ventures, community groups, or dedicated workspaces for engineering or environmental education. The questionnaire survey shows that PP workspaces have a stronger presence in the Global South than the RCs, even though more than half of the questionnaire survey responses are from countries in the Global North. The stronger presence of PPs in the Global South (compared with RCs) may be explained by the fact that the expressed purpose of the PP project is to provide blueprints that can be reproduced basically anywhere on the globe. Unless the public is involved in contributing raw material in events or through

Table 2

Summary of the initiatives. The rows represent the most common or most highly ranked answers in the questionnaire surveys, without providing further quantification.

	Repair Cafés	Precious Plastic Workspaces
Number of local initiatives listed	c. 2000 (303 responses = 15% of population)	c. 300 (48 responses = 16% of population)
Resource Life Extension	repairing of broken items	recycling of plastic waste
What happens?	visitors come and have stuff repaired by volunteers; strictly non commercial	people build machines, collect and recycle plastic into new stuff; many have commercial ambitions
Engaged people	on average, approximately 4–20 volunteers attending a repair session	on average, approximately 3–10 people, including volunteers and paid part-time or full-time staff;
How often?	usually monthly	weekly or more often
Where?	largely public buildings; concentrated in Western Europe and the Global North	largely private or shared spaces; globally widespread
Support received	largely provision of space, donations, few grants	largely self-funded, few grants
Key issues^a	finding broader support for their initiative, and specifically attracting young people as volunteers and visitors	investing enough time and/or money
Founders	usually one or more motivated individuals	usually one or more motivated individuals
Coordination	formal or informal	often informal
Legal status	similarly distributed between no legal status, some legal status, and being part of an umbrella initiative	without legal status or as some not-for-profit entity; fewer as commercial company
Variety in network	Largely homogeneous as all local initiatives have similar aims and models	heterogeneous including workspaces for commercial, educational, artistic, and other purposes; no policing by the PP central team

^a As a key issue we identified every of our suggested items which more than 50% of respondents have moderate or serious difficulties with.

collection boxes, or workspaces are used as educational spaces, PP workspaces have no visitors and approximately 3–10 collaborators. Some are volunteers, while others are full-time or part-time staff of the

workspace or umbrella organization. Unlike RCs, PP workspaces are located largely in private spaces or spaces shared with other initiatives, such as makerspaces. This can be explained by their use of static infrastructure (e.g., the machines used to recycle plastics or the equipment required to build and maintain these machines).

The questionnaire survey also reveals that in both communities, there exists a large share of local initiatives by motivated individuals or small groups, and they continue to be led formally or informally by individuals or small groups. A substantial share of RCs also has more formalized leadership arrangements, such as steering or coordinating committees. Local initiatives tend to be modest in size, and the growth of Repair Cafés and Precious Plastic occurs primarily through the mechanism of replication rather than upscaling.

5.2. Goals that drive Repair Cafés and Precious Plastic workspaces

In the RC questionnaire survey, respondents were asked to rank a list of commonly encountered goals for RCs, with the possibility of adding goals they felt were missing. Possible goals included more environmentally oriented goals (e.g., to help prevent and/or reduce waste), more socially oriented goals (e.g., to provide a space where people from the same neighborhood can come together), and more activist goals related to changing companies' behavior (e.g., to encourage companies to improve product reparability and longevity). More than half of the respondents in the RC sample ranked the prevention and/or reduction of waste first (see Fig. 4). Other relatively popular goals are to encourage visitors to repair items more often and to provide a space where people can share repair knowledge and skills. This reveals a strong focus on environmental goals for the majority of RCs, with a focus on encouraging repairs as a more concrete way in which the environmental ambitions are to be achieved. Even though environmental goals were most often ranked highest, they are frequently combined with social goals. This combination is typical for RCs, and the RCIF has also mentioned in earlier reports that it is this combination that makes the concept successful. The responses also show that activist goals tend to be ranked relatively low. This is relevant in light of the notion of political voice. As previously mentioned, the RCIF has become involved in lobbying activities, but doing so does not appear to be an aim of most local RCs, which suggests that a political voice may be less likely to develop at the level of a community as a whole.

In the questionnaire survey of PP workspaces, respondents were also shown a list of goals to rank, including environmental goals (e.g., to encourage others to live more sustainably), social goals (e.g., to do something with my/our local community) and more activist goals (e.g., to democratize the means of production). In this case, economic goals were also listed (e.g., to set up a small business), as well as goals related to personal development (e.g., to learn new skills myself/ourselves). For the PP workspaces, the overall ranking of goals is less pronounced than in the case of RCs (see Fig. 5). However, environmental goals were ranked highly relatively often, such as the goal to prevent plastic waste from ending up in the natural environment, encouraging others to live more sustainably, and increasing awareness about problems with plastic waste.

RCs and PPs are thus primarily run with environmental goals in mind, with a focus on waste prevention. In RCs, there is stronger attention to social goals, although these tend to be ranked slightly lower than environmental goals.¹⁴ With regard to goals, there is, at least to some extent, a shared narrative across the networks on environmental problems and (to a lesser extent, for RCs) social problems and on a role for the initiatives themselves to contribute to a better future.

In the case of the RCs, a sense of shared identity is also expressed in

¹⁴ There are, of course, exceptions to this. Our survey includes responses by RCs that prioritize social goals above everything else. We are here talking about the most common patterns in our data.

the fact that 89% of the respondents indicated that their RC makes use of the "official" RC logo,¹⁵ whereas only 31% of PP workspaces indicated that they make use of the official PP logo. This most likely relates to the fact that RCIF more actively encourages the use of a common logo, based on their desire to safeguard the international recognizability of the RC concept; in fact, the RCIF asks initiatives that want to make use of the RCIF starter kit and become listed on the website to agree to a number of conditions, including to always using the RC logo in publicity and communications.¹⁶

5.3. Local networking in the Repair Café and Precious Plastic communities

The questionnaire surveys included questions that give an indication of the extent to which RCs or PP workspaces build up local linkages. For example, the questionnaire survey asked what overlap exists between the initiatives of the respondents and different types of other local initiatives (see Figs. 6 and 7). The questionnaire surveys show that approximately half of the RC and PP workspaces in the samples have volunteers who also volunteer at other environmental or non environmental groups. The results also show that in the case of the RCs, many volunteers are active at multiple RCs. In the case of PP workspaces, it is more common that volunteers are also active in (other) commercial businesses in roles that are closely related to the practices conducted in PP workspaces.

As discussed in Section 2, one reason for initiatives to develop local linkages is to gain access to resources. The RC questionnaire survey asked respondents to indicate the importance of different kinds of external support that they attract (see Fig. 8). The results show that the most important forms of support are venues made available by public organizations (although these are considered unimportant by more than a quarter of the respondents) and monetary donations from visitors during Repair Café sessions. These monetary donations are, overall, also considered more important than funding from public or private organizations.

In the PP questionnaire survey, a similar question focused specifically on what sources of funding are used by the PP workspaces (see Fig. 9). The results show that the majority of PP workspaces in the sample are self-funded. Like RCs, PP workspaces do not appear to make heavy use of local connections to gain access to funding. In this context, it is relevant to know that more than half of the respondents to the PP questionnaire survey indicated that they have moderate to serious difficulties investing enough money in their workspace.¹⁷ As discussed later in this paper, attracting more private and public funding is also considered an important future development for a large share of the PP respondents (see Fig. 16).

5.4. Translocal networking in the Repair Café and Precious Plastic communities

The questionnaire survey included questions about connections that the initiatives of the respondents have with other initiatives in their community (i.e., other RCs or other PP workshops). More specifically, respondents were asked about different types of networking activities that they engage in. An overview of such activities in different countries is provided for the RCs to show differences in networking across the world (see Table 3). The table indicates that in a number of countries, there are more organized national and regional activities, especially in Germany, the Netherlands and France. From the data, it is unclear to

¹⁵ A logo provided by the RCIF to Repair Cafés that make use of their starter kit.

¹⁶ <http://repaircafe.org/en/conditions/>.

¹⁷ This was indicated in response to a survey question that we do not discuss in detail here.

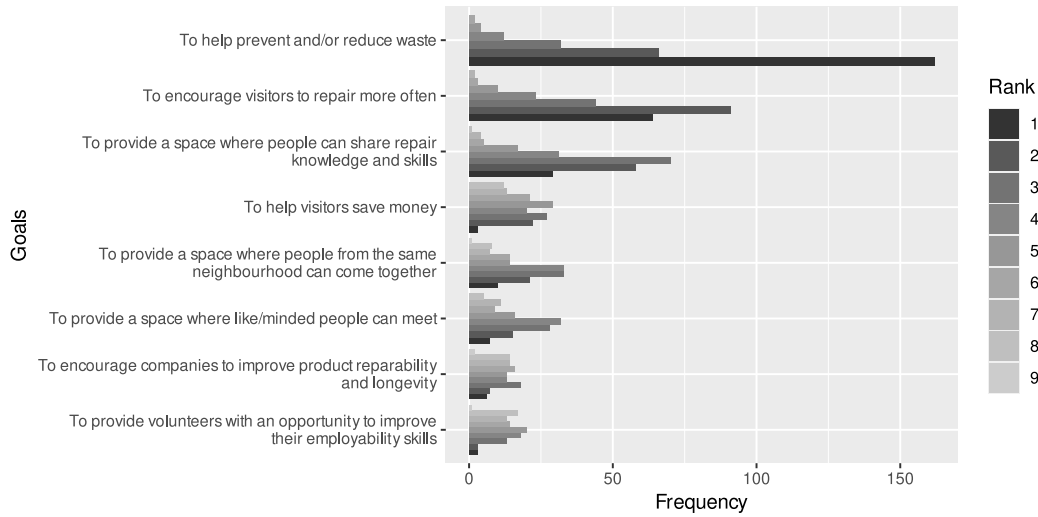


Fig. 4. Ranking of goals by Repair Cafés.

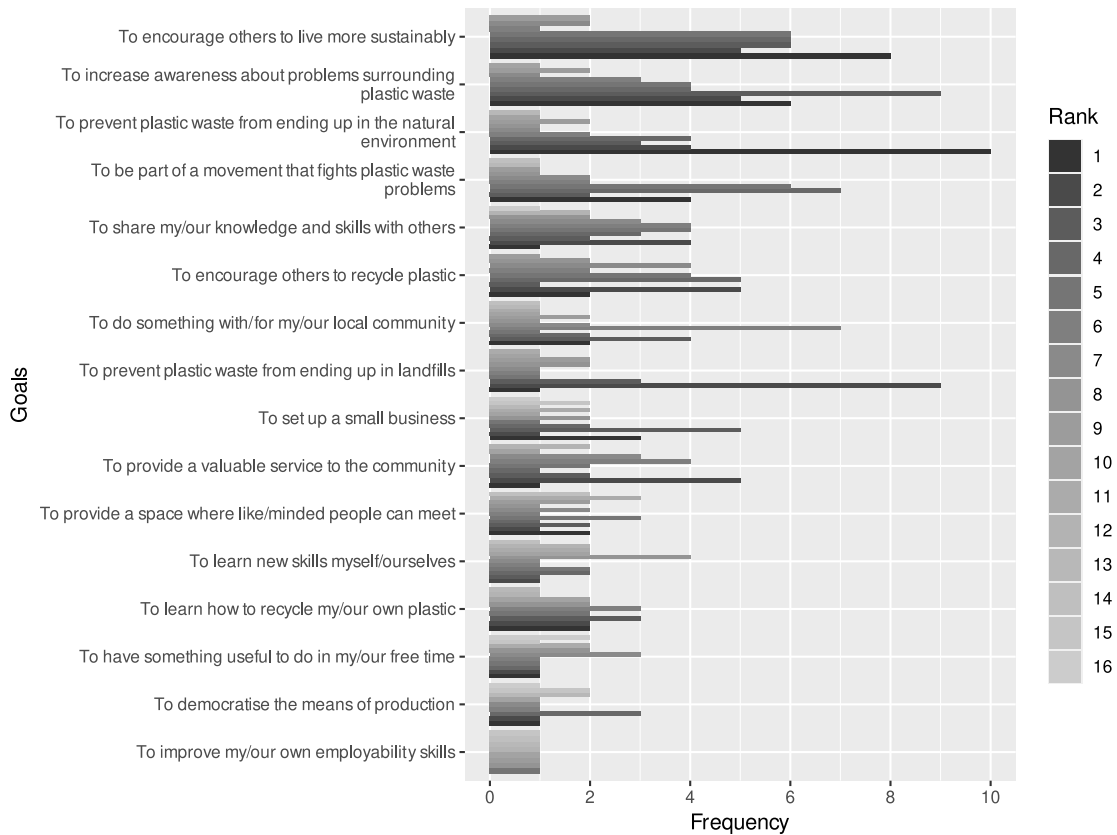


Fig. 5. Ranking of goals by Precious Plastic workspaces.

what extent these regional and national networks are also connected with each other. Thus, there is evidence of translocal linkages developing, but not in all countries. This also shows that multiple networks exist within the RC community rather than one overall network. The table also indicates the sharing of information via online platforms and collaboration between local RCs. This occurs primarily in countries where there are also stronger indications for the existence of regional and/or national networks. For the PP workspaces, there is only an aggregate overview, since usually just one response was received from a

particular country (see Fig. 10). Less than half of the workspaces in our sample indicate that they are part of a PP network.

In both initiatives, there is an inclination to give support to (and to a slightly lesser extent receive support from) nearby RCs or PP workspaces. Local initiatives in both communities are drawn toward social media for sharing ideas and knowledge with other RCs and PP workspaces or the general public, but there is a clear tendency for PP workspaces to also use the forum provided by the PP team for interaction, whereas this is hardly the case for RCs and the forum provided by the

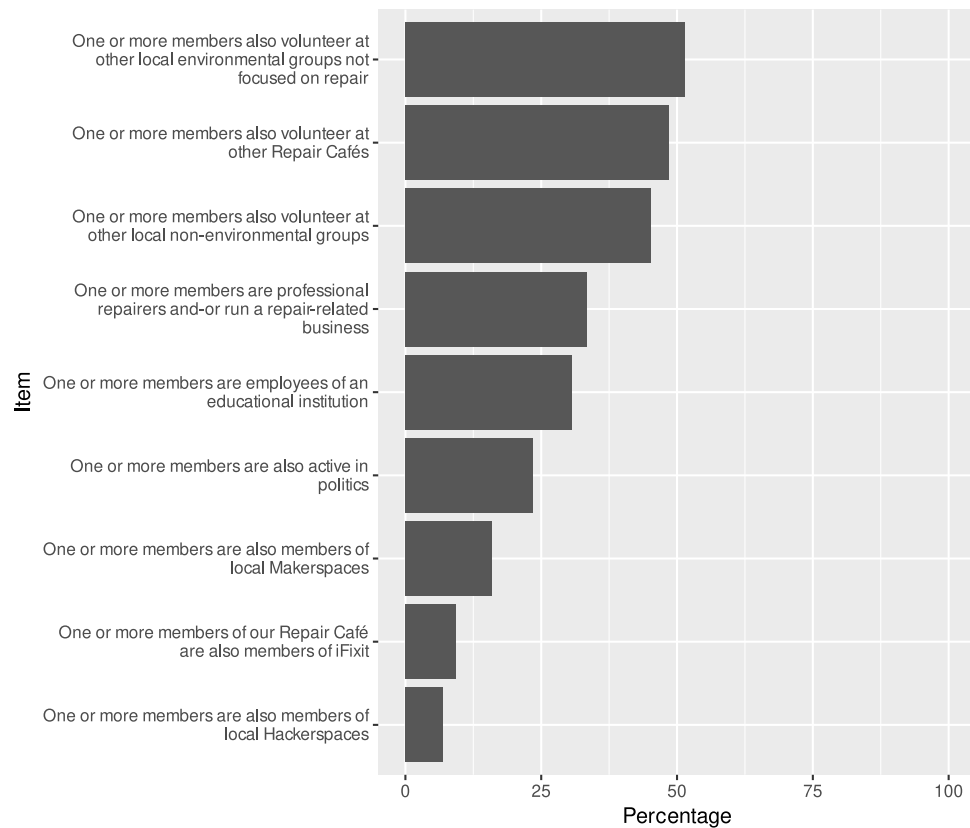


Fig. 6. Overlap of Repair Cafés with other organizations.

RCIF.

Repair Cafés were also asked specifically about the extent to which they collect (see Fig. 11) and share data (see Fig. 12) on the products that are brought in for repair, which can be understood as a specific type of knowledge exchange. A fairly large share of the respondents indicate that their RC does collect data on products in some form. However, the vast majority of the respondents also indicate that they do not share data on products with other RCs or with the RCIF.

Thus, translocal networking does occur in both initiatives, but in the RC initiative, it appears to be concentrated primarily in certain countries, while in the PP initiative, translocal networking is also not community wide.

5.5. The roles of the Repair Café international foundation and the Precious Plastic team

The questionnaire surveys asked how respondents view their relationship with the RCIF and the PP team. Their responses (see Figs. 13 and 14) show that most initiatives in the samples indicate that they operate fully independently but that the RCIF and the PP team played an important role in, for example, inspiring the goals of the respondents' local RC or PP workspaces. A fair number of respondents believed that their initiative would not have existed had it not been for the existence of the RCIF or PP team. This demonstrates the important role that these organizations play in diffusing a shared narrative (at least where it concerns goals) and in stimulating the replication of their 'concept' in different places around the world. It also demonstrates that local initiatives generally do not depend on these organizations for their day-to-day operations.

The literature on translocal networks ascribes such a role to 'networking organizations', but this label perhaps places too much emphasis on 'networking' to apply to the RCIF and the PP team. For

example, while the RCF (before 2016) engaged in the development of networks in the Netherlands, the RCIF (after 2016) is not directly engaged in building networks in other places in the world. As mentioned previously, the RCIF does offer Dutch RCs to become paid members of the RC network in the Netherlands. The PP team is more like a networking organization, with its strong focus on building an online infrastructure where members of the community can connect. However, for both organizations, the most important role is to continue to develop and diffuse the RC and PP concepts themselves—acting more like 'catalysts'. Thus, the label of 'grassroots intermediary' (Hargreaves et al., 2013) perhaps is a better fit than 'networking organization' because it puts a stronger emphasis on the role of the organizations in the management of knowledge flows between local initiatives and the wider community.

5.6. The future of Repair Cafés and Precious Plastic

The questionnaire surveys asked respondents what developments they feel are important for the future development of their RCs and PP workspaces (see Figs. 15 and 16). For the RCs, a specific theme that comes up frequently within their community is the fact that their participants (and visitors) tend to be of older generations. This explains why many RCs feel that developing activities to attract younger audiences is a high priority.

An interesting commonality across both initiatives is that stronger involvement in campaigns for improved reparability and product longevity and against plastic waste is also prioritized relatively highly. Of course, it is important to consider that this is a question about what the initiatives may want to do in the future and not what they are doing at present. The responses should thus be taken as indicators of aspirations rather than as reflecting the current reality. This interpretation is also supported by the previously mentioned observation that activist

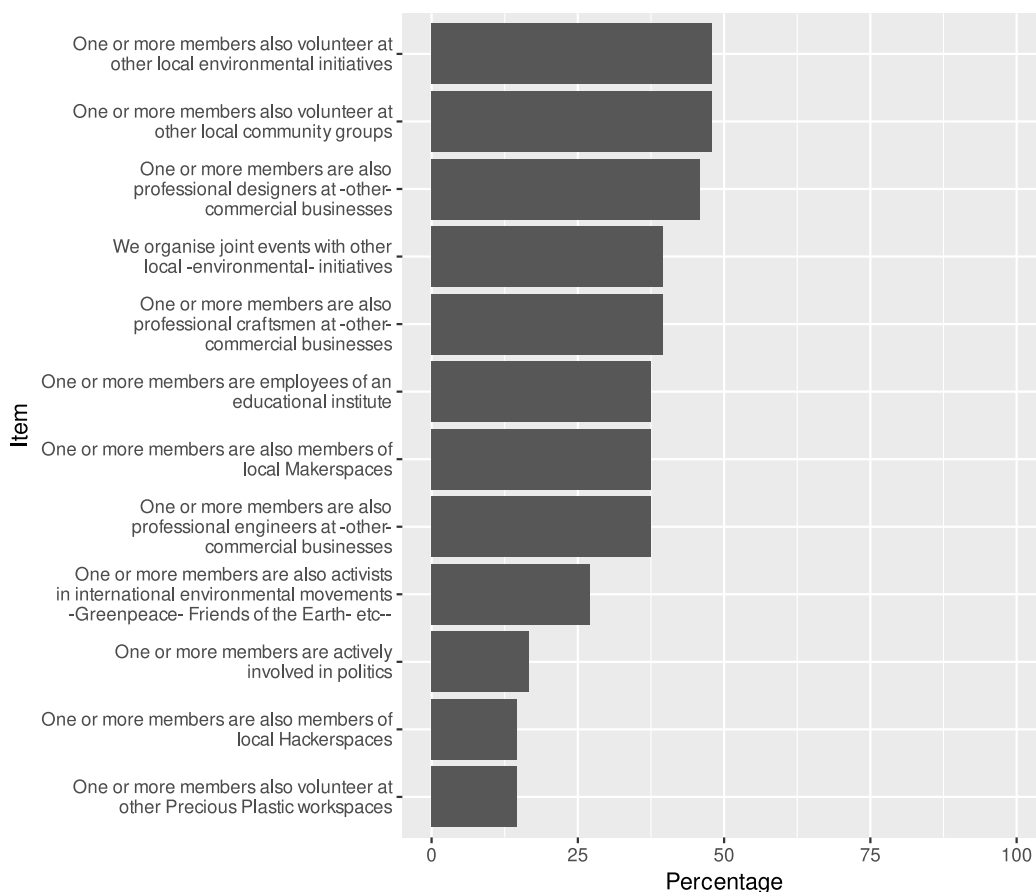


Fig. 7. Overlap of Precious Plastic workspaces with other organizations.

goals are ranked relatively low in the case of RCs. Moreover, fulfilling these aspirations would require resources (e.g., additional time, lobbying skills, access to relevant actors) that many local initiatives currently do not possess.

Among both the RC and PP workspaces, there is a desire to continue developing links with environmental initiatives ‘outside’ their own communities. Quite a few of the RCs and PP workspaces see attracting additional public and (in the case of PP) private support for their work as another priority. This indicates that they are still looking to invest more in their local embeddedness and their local networks. This also tends to be prioritized slightly more than developing stronger (regional) networks among themselves, although this too ranks relatively high in the order of prioritization.

Respondents were asked similar questions about how they see the future roles of the RCIF and the PP team. Respondents from the RCs give a high priority to lobbying by the RCIF for policies to encourage better product design, increasing consumer awareness about the need to repair, and entering into a dialogue with companies to nudge them toward better product design. Many respondents considered these to be more important activities for the RCIF than facilitating the further expansion of the translocal network. For the PP community, this question was asked in a slightly different way, asking how they see the division of roles between them and the central PP team in relation to different types of activities. Their answers show that they primarily see a role for the PP team in further improving the online platform,¹⁸ including the bazaar, and to a lesser extent improving blueprints and

guidelines on how to start a Precious Plastic project. Thus, where RC respondents focus more on strengthening the political role of the RCIF, the PP respondents focus more on the facilitating role of the PP team.

6. Discussion

6.1. Repair Cafés and Precious Plastic workspaces as organized citizen initiatives for a circular economy

Most definitions and conceptualizations of CE assert no or a limited role to civil society, and if they include these, then they do so often only as passive consumers (Hobson, 2015, 2021). Studies that examine the more active role that civil society can play in (transitions toward) the CE in the form of organized citizen initiatives are still rare; the studies of Gutberlet et al. (2017) on waste picker initiatives in the Global South, of Unterfrauner et al. (2019) on makerspaces, and of Gobert et al. (2021) on repair initiatives in France are important exceptions.

The current paper adds to these studies in two main ways. First, it adds to the body of empirical evidence on the existence of (communities of) organized citizen initiatives for CE. Most importantly, the Precious Plastic community is an example that has, to the best of our knowledge, not previously been explored. The development of this body of evidence is important because, as Hobson (2015) suggest, there is a need to investigate “spaces where disparate forms of the CE may emerge and/or be fostered in forms and ways that current analyses of the CE omits or at least obscures from view” (p. 99). More specifically, as argued earlier in this paper, it is important to identify spaces where forms of CE emerge and are fostered in which civil society plays a role that goes beyond a role as consumers. Second, and most importantly, this paper uses the lens of translocal networks to open the door to investigations of how

¹⁸ This survey was held before version 4 of the concept was launched, which already introduces further improvements to the online platform.

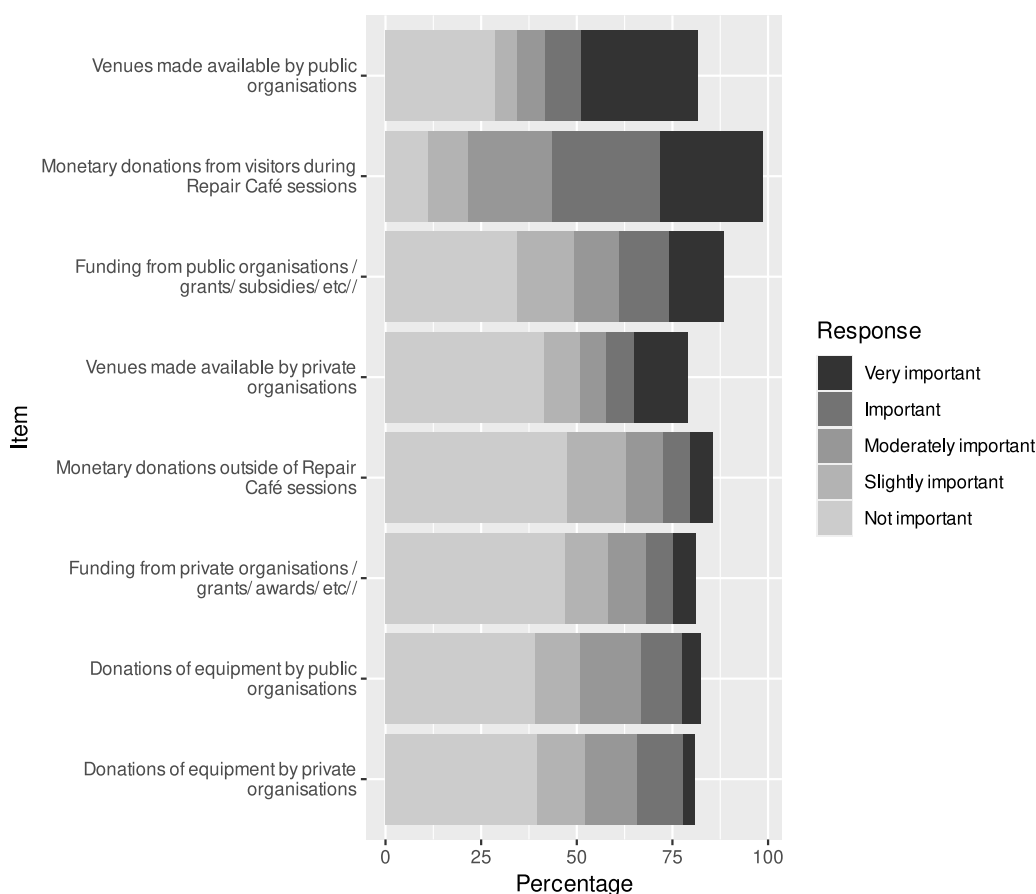


Fig. 8. Importance of different types of external support for Repair Cafés.

organized citizen initiatives for CE can develop qualities (i.e., critical mass, shared identity and political voice) necessary for the forms of CE that they promote to ‘gain a foothold’ in a broader institutional landscape, in which market- and technology-driven visions of CE still dominate. The subsections below outline the key insights obtained by applying the conceptual lens of translocal networks to the RC and PP communities.

6.2. Repair Cafés and Precious Plastic as translocal communities

The findings of the study show that the RC and PP communities are indeed *similar* to translocal networks in several ways. They are made up of multiple smaller networks at the regional and national levels, although it is not obvious that they are all interconnected in practice. Moreover, these networks only clearly exist in a few countries. The questionnaire surveys also provide evidence that initiatives connect locally and that a large share of the initiatives in these networks engage in limited knowledge and resource exchange. This aligns with the observation of Pel et al. (2020a) that translocal networks tend to develop limited degrees of formalization and exchange of resources. It seems an overstatement to refer to the RC community or the PP community as *networks*. Instead, the label of translocal *communities* seems more appropriate. Within these communities, there exist like-minded initiatives that are also similar in terms of organization and that are, to some extent, connected in regional and national networks (in the case of RCs, this networking clearly does not occur in all countries). Many initiatives will consider themselves a member of these communities ‘in name only’, and many like-minded initiatives are associated with other communities. Thus, there is a clear element of translocalism in the communities, in the sense that they are present in multiple localities at the same time

(cf. Oakes and Schein, 2006). In the case of the RCs, however, the establishment of linkages appears to occur in some countries, but not all, and in the case of PP workspaces, approximately half of the respondents indicate that linkages with other workspaces exist.

6.3. The transformative potential of Repair Cafés and Precious Plastic

An interesting characteristic of translocal communities, at least in theory, is their ability to develop transformative potential (Avelino et al., 2019). As discussed in the conceptual section, this requires the community to develop critical mass, a shared identity *and* a political voice. The findings of this study show that this transformative potential is not an inherent characteristic of translocal communities. The findings reveal that the RC and PP communities have grown rapidly and, in some places, have developed regional and national networks that can contribute to the generation of a critical mass, although these will be unevenly distributed, given the distribution of networking activities (in addition, the literature on translocal networks is unclear about exactly *when* a critical mass required for transformative potential is achieved). In the RC community, there is comparatively stronger evidence of a shared identity, through a stronger agreement across respondents on the goals that their initiatives pursue and by the wider spread use of a common logo. PP workspaces are more varied in their purposes and are less likely to make use of a common logo. In neither of the communities does there exist strong evidence of the development of a political voice. In the case of RCs, lobbying activities are taken up by the RCIF as part of the wider “Right to Repair” lobby. However, similar activities are not taken up by local RCs. Indeed, there are indications that RCs see a role for the RCIF in championing repair and not in the organization of RCs, other than offering starter kits and the opportunity to use a common

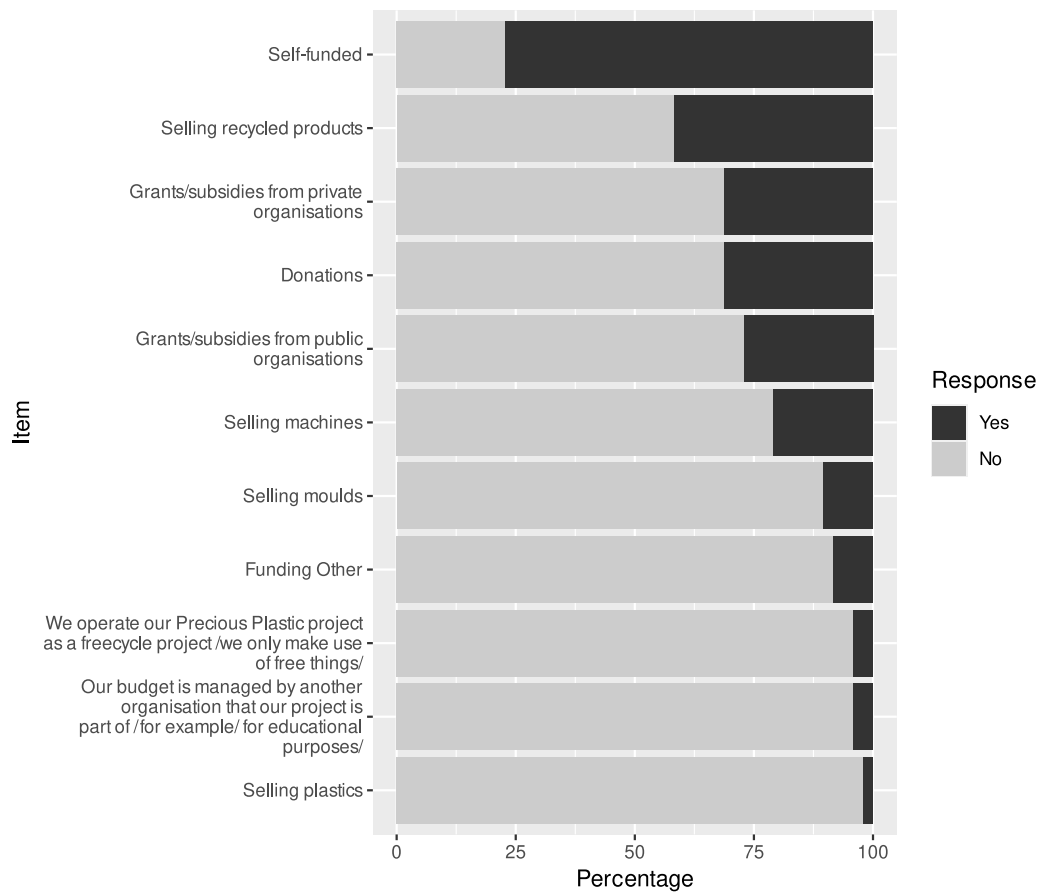


Fig. 9. How Precious Plastic workspaces obtain funding.

Table 3

Summary of networking activities among Repair Cafés in different countries (ordered by the number of responses from these countries).

Country	Member of regional network	Member of national network	Attend regional meetings (discussion, meetings, conferences, workshops)	Attend national meetings (discussion, meetings, conferences, workshops)	Share knowledge and experiences via RCIF forum	Share knowledge and experiences via other online platforms or social media	Joint repair sessions	Give support to nearby RCs (volunteers, advice, equipment, etc.)	Receive support from nearby RCs (volunteers, advice, equipment, etc.)
Germany (N = 86)	32	24	30	12	11	17	14	36	30
Netherlands (N = 72)	12	35	9	13	14	13	7	27	16
France (N = 59)	17	18	11	1	9	14	16	25	26
Great Britain (N = 25)	9	0	8	3	2	12	2	21	15
United States (N = 22)	6	0	4	1	4	12	1	14	9
Australia (N = 12)	7	4	2	2	2	7	1	8	8
Canada (N = 16)	2	0	1	0	0	4	2	10	2
Italy (N = 3)	1	2	0	0	0	0	0	2	1
Austria (N = 4)	0	3	2	1	0	2	1	3	1
Ghana (N = 1)	0	0	0	0	0	1	0	0	0
India (N = 1)	0	0	1	0	1	0	0	0	0
Liechtenstein (N = 1)	1	0	0	0	0	0	0	0	0
Sweden (N = 1)	0	0	0	0	0	0	0	1	0

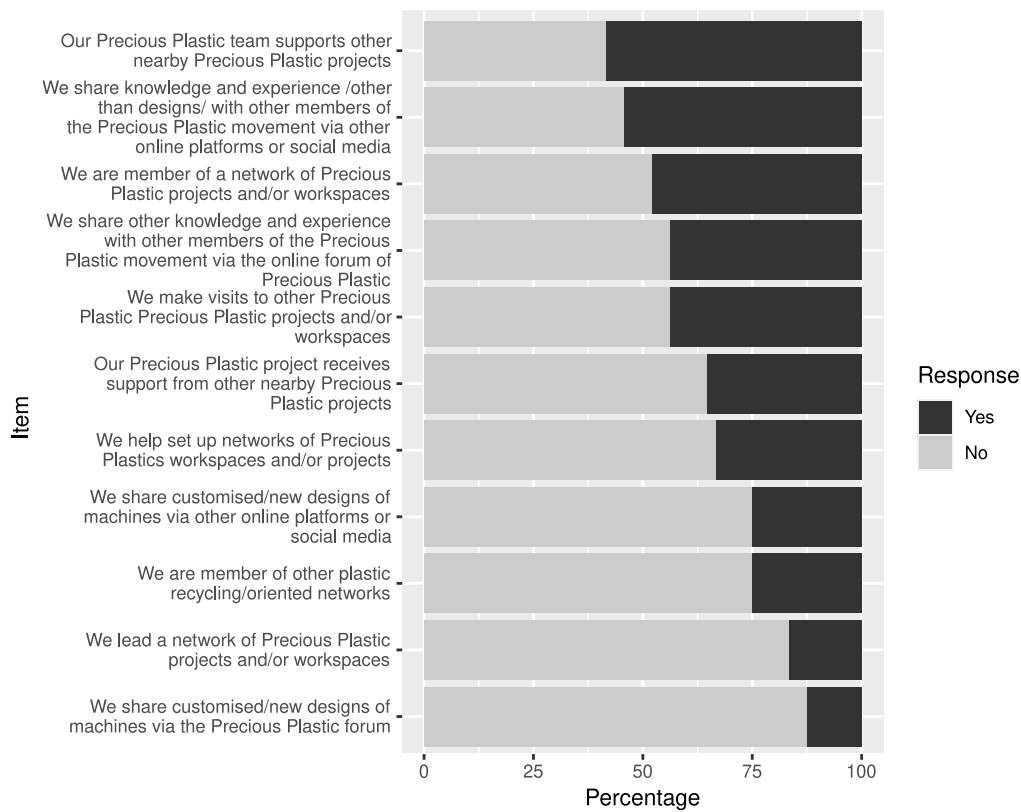


Fig. 10. Networking activities of Precious Plastic workspaces.

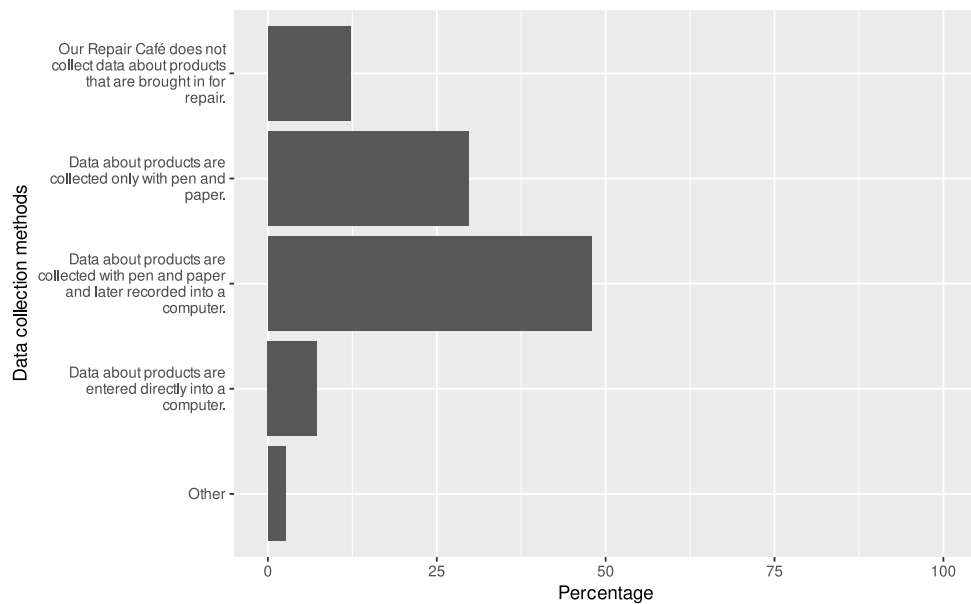


Fig. 11. Data collection by Repair Cafés.

logo, which are useful primarily in the ‘start-up’ phase of RCs. Moreover, the “Right to Repair” narrative is driven by a movement that includes many other repair initiatives in addition to RCs and is not something that emerged from the RC community but rather is something that the RCIF has been able to connect to. The findings on the PP community do not provide evidence for the development of a political voice by the PP team.

Regarding local initiatives in both communities, they are first and

foremost practical in their approach to promoting and enacting their vision of the CE. Even though the questionnaire surveys indicate that a large share of the local RCs and PP workspaces in our samples aspire to develop greater involvement in campaigns to improve reparability and/or product longevity or campaigns against plastic waste, it is unclear how realistic this is in practice, given that the local initiatives have limited resources (especially time) to engage in additional activities beyond their more practical engagement with repairing and recycling

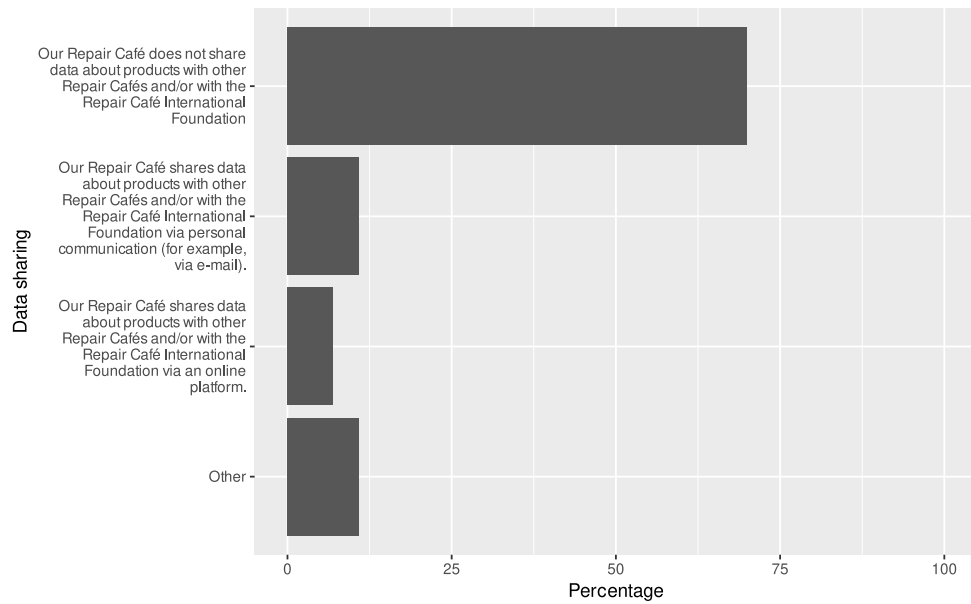


Fig. 12. Data sharing by Repair Cafés.

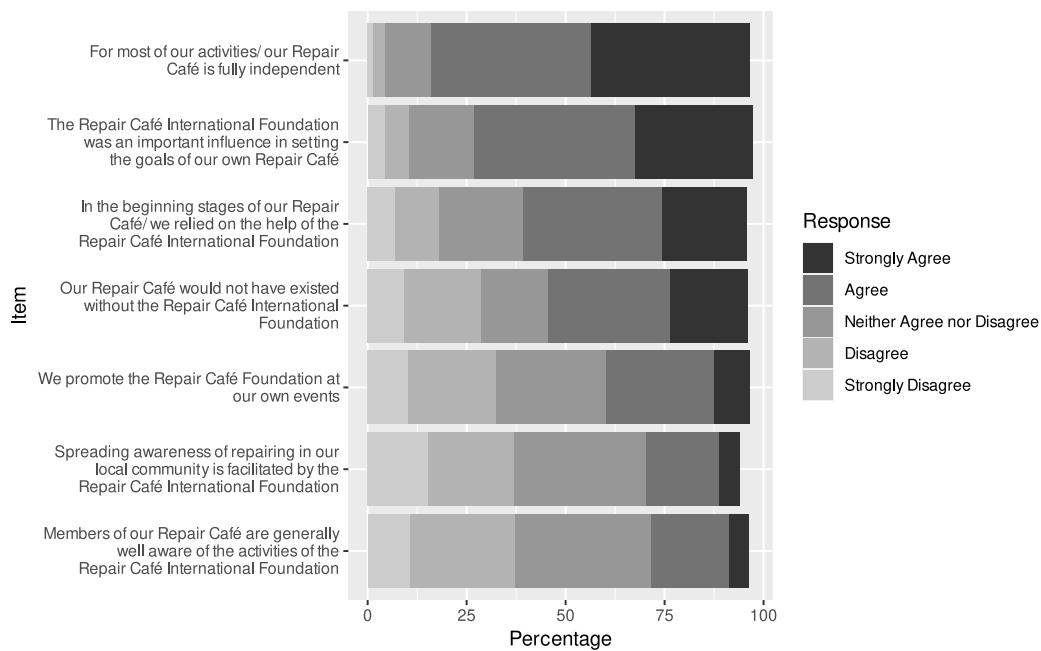


Fig. 13. How RCs look at the role of RCIF.

plastic waste.

7. Conclusions

This study shows that the notion of translocal networks indeed has relevance for the CE literature, based on two rapidly growing examples in the form of the RC and PP initiatives. Both initiatives are translocal in nature and have developed a sense of shared identity and purpose. However, translocal networking in these initiatives does not occur community-wide, which means that a critical mass may also develop unevenly across these initiatives. Furthermore, there is little to no evidence of the development of political voice (except for lobbying activities in which the RCIF is involved), which is another key ingredient of

transformative potential. This appears to be closely associated with the nature of the activities that RCs and PP workspaces are engaged in: Rather than presenting radical alternatives (e.g., de-growth and sufficiency; see [Hobson, 2015](#)) to currently dominant visions of the CE (ones that emphasize technology and market-based approaches to CE), the RC and PP communities are both primarily engaged in practical activities (“everyday activism”, in [Hobson’s \(2015\)](#) words) that help to deal with the negative externalities of contemporary economies in ways that align with dominant visions on CEs (e.g., by repairing broken products that otherwise are thrown away and by recycling plastic wastes that are otherwise landfilled or end up in nature). It is thinkable that, through these practical activities, the RC and PP communities create opportunities for the dissemination of a culture of circularity, by normalizing

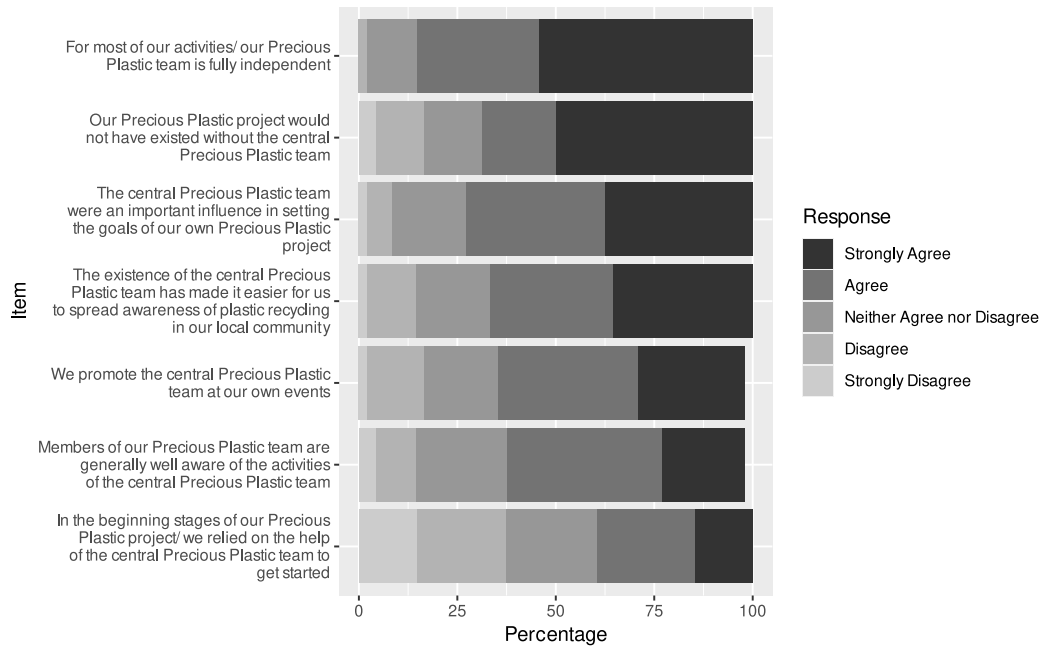


Fig. 14. How PPs look at the role of the central PP team.

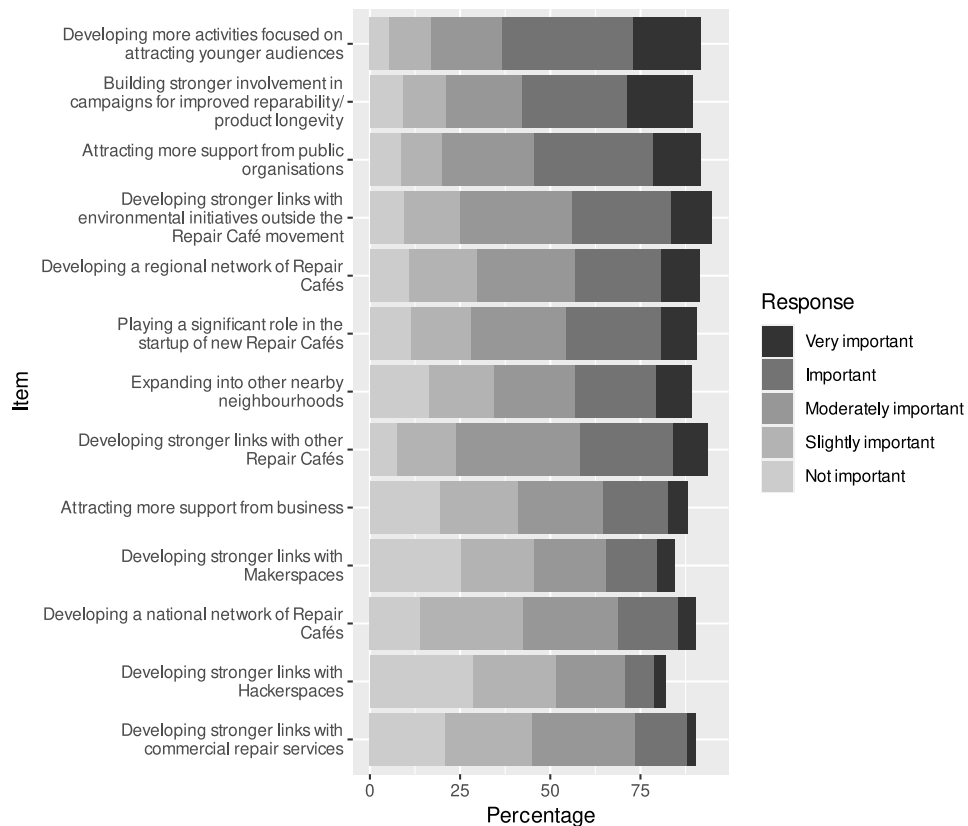


Fig. 15. How Repair Cafés see priorities for their future.

circular practices in their local communities and restoring and nurturing ideas about the importance of valuing the products and materials that we use. However, establishing whether the RC and PP communities indeed have such a broader cultural impact requires further investigation that is beyond the scope of this paper.

That translocal communities such as the RC and PP initiatives have thus far received little to no attention in the academic literature on CEs is unfortunate, since they offer perspectives on the CE that are currently rare in academic writing on the topic. Increased attention to initiatives such as RC and PP needs to go hand in hand with increased conceptual

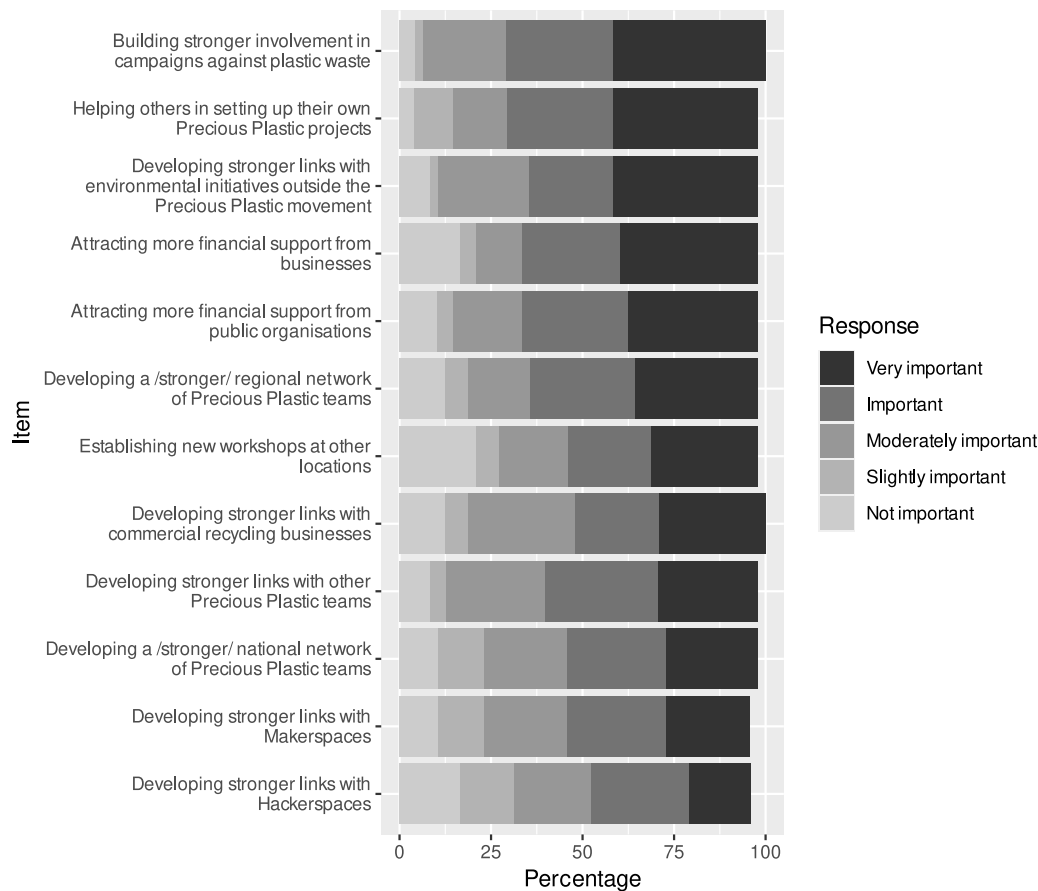


Fig. 16. How Precious Plastic workspaces see priorities for their future.

inclusivity of the CE literature (cf. [Hobson and Lynch, 2016](#)). This is required for the CE literature to be able to account for the involvement in (transitions toward) the CE of actors that goes beyond the traditional involvement of companies, policy-makers and consumers. This conceptual inclusivity is also required to account for grassroots perspectives on the CE that challenge the currently dominant visions that emphasize technology and market-based solutions (cf. [Jaeger-Erben et al., 2021](#)). Practically speaking, this requires that CE scholars pay more attention to the involvement of organized citizen initiatives in CE discourses and practices and acknowledge that civil society actors cannot simply be reduced to consumers.

CRedit authorship contribution statement

Wouter Spekkink: Conceptualization, Data curation, Funding acquisition, Investigation, Methodology, Project administration, Supervision, Visualization, Writing – original draft. **Malte Rödl:** Data curation, Investigation, Methodology, Software, Visualization, Writing – review & editing. **Martin Charter:** Conceptualization, Validation, Writing – review & editing.

Declaration of competing interest

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

Data availability

Data will be made available on request.

Acknowledgements

Funding: This work was supported by the Sustainable Consumption Institute of the University of Manchester. We would also like to thank the Repair Café International Foundation and the Precious Plastic team for providing support in the preparation and distribution of the questionnaire surveys. We thank the trustees of the Farnham Repair Café, the board of the Repair Café Delft and various users of the forums of the Precious Plastic website for providing feedback on pilot questionnaire surveys. Finally, we thank the anonymous reviewers for their comments on earlier versions of this paper, which helped us to improve our work.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2022.135125>.

References

- Adams, D., Hess, M., 2010. Social innovation and why it has policy significance. *Econ. Lab. Relat. Rev.* 21 (2), 139–155.
- Avelino, F., Wittmayer, J.M., Pel, B., Weaver, P., Dumitru, A., Haxeltine, A., Kemp, R., Jørgensen, M.S., Bauler, T., Ruijsink, S., O'Riordan, T., 2019. Transformative social innovation and (dis)empowerment. *Technol. Forecast. Soc. Change* 145, 195–206.
- Becchetti, L., 2012. Voting with the wallet. *Int. Rev. Econ.* 59 (3), 245–268.
- Becchetti, L., Cermelli, M., 2018. Civil economy: definition and strategies for sustainable well-living. *Int. Rev. Econ.* 65 (3), 329–357.
- Blomsma, F., Brennan, G., 2017. The emergence of circular economy: a new framing around prolonging resource productivity. *J. Ind. Ecol.* 21 (3), 603–614.
- Boyer, R.H.W., 2015. Grassroots innovation for urban sustainability: comparing the diffusion pathways of three ecovillage projects. *Environ. Plann.* 47 (2), 320–337.
- Boyer, R.H.W., 2018. Intermediacy and the diffusion of grassroots innovations: the case of cohousing in the United States. *Environ. Innov. Soc. Transit.* 26, 32–43. July 2017.

- Camacho-Otero, J., Boks, C., Pettersen, I., 2018. Consumption in the circular economy: a literature review. *Sustainability* 10 (8), 2758.
- Charter, M., Keiller, S., 2014. *Grassroots Innovation and the Circular Economy: A Global Survey of Repair Cafés and Hackerspaces*. The Centre for Sustainable Design (July). Retrieved from. <http://cfsd.org.uk/site-pdfs/circular-economy-and-grassroots-innovation/Survey-of-Repair-Cafes-and-Hackerspaces.pdf>.
- Charter, M., Keiller, S., 2016. *The Second Global Survey of Repair Cafés : A Summary of Findings*. May 2016. The Centre for Sustainable Design. Retrieved from. [https://cfsd.org.uk/site-pdfs/The Second Global Survey of Repair Cafés - A Summary of Findings.pdf](https://cfsd.org.uk/site-pdfs/The%20Second%20Global%20Survey%20of%20Repair%20Cafes%20-%20A%20Summary%20of%20Findings.pdf).
- Geissdoerfer, M., Savaget, P., Bocken, N.M.P., Hultink, E.J., 2017. The Circular Economy – a new sustainability paradigm? *J. Clean. Prod.* 143, 757–768.
- Ghisellini, P., Cialani, C., Ulgiati, S., 2016. A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *J. Clean. Prod.* 114, 11–32.
- Gobert, J., Allais, R., Deroubaix, J.F., 2021. Repair and reuse: misalignments between stakeholders and possible users. *J. Clean. Prod.*, 128454.
- Gregson, N., Crang, M., Fuller, S., Holmes, H., 2015. Interrogating the circular economy: the moral economy of resource recovery in the EU. *Econ. Soc.* 44 (2), 218–243.
- Gupta, A.K., Sinha, R., Koradia, D., Patel, R., Parmar, M., Rohit, P., et al., 2003. Mobilizing grassroots' technological innovations and traditional knowledge, values and institutions: articulating social and ethical capital. *Futures* 35 (9), 975–987.
- Gutberlet, J., Carenzo, S., Kain, J.H., de Azevedo, A.M.M., 2017. Waste picker organizations and their contribution to the circular economy: two case studies from a Global South Perspective. *Resources* 6 (4).
- Hargreaves, T., Hielscher, S., Seyfang, G., Smith, A., 2013. Grassroots innovations in community energy: the role of intermediaries in niche development. *Global Environ. Change* 23 (5), 868–880.
- Hobson, K., 2015. Closing the loop or squaring the circle? Locating generative spaces for the circular economy. *Prog. Hum. Geogr.* 40 (1).
- Hobson, K., 2021. The limits of the loops: critical environmental politics and the Circular Economy. *Environ. Polit.* 30 (1–2), 161–179.
- Hobson, K., Lynch, N., 2016. Diversifying and de-growing the circular economy: radical social transformation in a resource-scarce world. *Futures* 82, 15–25.
- Hossain, M., 2016. Grassroots innovation: a systematic review of two decades of research. *J. Clean. Prod.* 137 (September 2015), 973–981.
- Hossain, M., 2018. Grassroots innovation: the state of the art and future perspectives. *Technol. Soc.* 55 (February), 63–69.
- Howaldt, J., Kaletka, C., Schröder, A., Zirngiebl, M. (Eds.), 2018. *Atlas of Social Innovation: New Practices for a Better Future*. Sozialforschungsstelle, TU Dortmund University, Dortmund.
- Jaeger-Erben, M., Jensen, C., Hofmann, F., Zwiers, J., 2021. There is no sustainable circular economy without a circular society. *Resour. Conserv. Recycl.* 168, 105476.
- Johansson, N., Henriksson, M., 2020. Circular economy running in circles? A discourse analysis of shifts in ideas of circularity in Swedish environmental policy. *Sustain. Prod. Consum.* 23, 148–156.
- Johansson, N., 2021. Does the EU's action plan for a circular economy challenge the linear economy? *Environ. Sci. Technol.* 55 (22), 15001–15003.
- Kirchherr, J., Reike, D., Hekkert, M., 2017. Conceptualizing the circular economy: an analysis of 114 definitions. *Resour. Conserv. Recycl.* 127 (April), 221–232.
- Lazarevic, D., Valve, H., 2017. Narrating expectations for the circular economy: towards a common and contested European transition. *Energy Res. Social Sci.* 31 (May), 60–69.
- Loorbach, D., Wittmayer, J., Avelino, F., Von Wirth, T., Frantzeskaki, N., 2020. Transformative innovation and translocal diffusion. *Environ. Innov. Soc. Transit.* 35, 251–260.
- Merli, R., Preziosi, M., Acampora, A., 2018. How do scholars approach the circular economy? A systematic literature review. *J. Clean. Prod.* 178, 703–722.
- Millard, J., 2018. How social innovation underpins sustainable development. In: Howaldt, J., Kaletka, C., Schröder, A., Zirngiebl, M. (Eds.), *Atlas of Social Innovation: New Practices for a Better Future*. Technische Universität Dortmund, ZWE Sozialforschungsstelle, Dortmund, pp. 41–43.
- Monticelli, L., 2018. Embodying alternatives to capitalism in the 21st century. *TripleC: Commun. Capitalis. Critiq. Open Access J. Global Sustain. Information Soc.* 16 (2), 501–517.
- Moulaert, F. (Ed.), 2013. *The International Handbook on Social Innovation; Collective Action, Social Learning and Transdisciplinary Research*. Edward Elgar, Cheltenham.
- Nicolosi, E., Feola, G., 2016. Transition in place: dynamics, possibilities, and constraints. *Geoforum* 76, 153–163.
- Oakes, T., Schein, L. (Eds.), 2006. *Translocal China: Linkages, Identities and the Reimagining of Space*. Routledge/Taylor & Francis Group.
- Pel, B., Haxeltine, A., Avelino, F., Dumitru, A., Kemp, R., Bauler, T., Kunze, I., Dorland, J., Wittmayer, J., Jørgensen, M.S., 2020a. Towards a theory of transformative social innovation: a relational framework and 12 propositions. *Res. Pol.* 49 (8), 104080.
- Pel, B., Wittmayer, J., Dorland, J., Søgaard Jørgensen, M., 2020b. Unpacking the social innovation ecosystem: an empirically grounded typology of empowering network constellations. *Innovat. Eur. J. Soc. Sci. Res.* 33 (3), 311–336.
- Pel, B., Wallenborn, G., Bauler, T., 2016. Emergent transformation games: exploring social innovation agency and activation through the case of the Belgian electricity blackout threat. *Ecol. Soc.* 21 (2).
- Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018. Towards a consensus on the circular economy. *J. Clean. Prod.* 179, 605–615. <https://doi.org/10.1016/j.jclepro.2017.12.224>.
- Seyfang, G., Smith, A., 2007. Grassroots innovations for sustainable development: towards a new research and policy agenda. *Environ. Polit.* 16 (4), 584–603.
- Smith, A., Fressoli, M., Abrol, D., Arond, E., Ely, A., 2016. *Grassroots Innovation Movements*. Routledge, London.
- Smith, A., Seyfang, G., 2013. Constructing grassroots innovations for sustainability. *Global Environ. Change* 23 (5), 827–829.
- Unterfrauner, E., Shao, J., Hofer, M., Fabian, C.M., 2019. The environmental value and impact of the Maker movement—insights from a cross-case analysis of European maker initiatives. *Bus. Strat. Environ.* 28 (8), 1518–1533.
- Van der Have, Rubalcaba, 2016. Social innovation research: An emerging area of innovation studies? *Res. Pol.* 45 (9), 1923–1935. <https://doi.org/10.1016/j.respol.2016.06.010>.
- Wittmayer, J.M., Backhaus, J., Avelino, F., Pel, B., Strasser, T., Kunze, I., Zijderwijk, L., 2019. Narratives of change: how social innovation initiatives construct societal transformation. *Futures* 112, 102433. <https://doi.org/10.1016/j.futures.2019.06.005>.
- Ziegler, R., 2019. Viewpoint - water innovation for a circular economy: the contribution of grassroots actors. *Water Altern. (WaA)* 12 (2), 774–787.