Citizen Social Science and Pathways to Prosperity: Co-designing Research and Impact in Beirut, Lebanon

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Abstract: This article argues for a citizen social science methodology in which residents from the sites of inquiry play a central role in key activities of the research process and beyond: research design and data collection, presentation and publication of findings, and design and implementation of urban interventions that address challenges to quality of life. This is a way of democratising the research process through sustained engagement with communities and an emphasis on co-designing pathways to impact. The article draws on the authors' experience of running a citizen social science project in Beirut, Lebanon, where citizen scientists, university academics, and NGOs have worked collaboratively to understand what prosperity means for local residents, develop context-specific measures of prosperity, and design and implement small-scale interventions for local challenges.

Keywords: Participatory methods, co-design, Lebanon, Beirut, urban studies

The Covid-19 pandemic has posed a number of challenges to social science research, especially for international projects where researchers have to work outside of the country where they are institutionally based. Travel restrictions and lockdowns have made fieldwork and data collection extremely difficult, if not impossible, for many. This challenging situation has lent new relevance to the long-standing conversation about participatory methodologies in which researchers who live in the sites of inquiry lead on fieldwork, data collection and other activities – methodologies that are variously referred to as 'community research', 'community-based participatory research', 'participatory action research', 'peer research' and, our preferred term, 'citizen science' or 'citizen social science'. One well-known benefit of such approaches is that local people have the knowledge, skills and networks to navigate the sites of inquiry, making them effective partners in the research process (e.g. Ryan et al. 2011, Edwards and Alexander

2011). The fact that they do not need to travel to the field is also beneficial in the context of Covid and at a time when movement is restricted. However, although the Covid crisis has highlighted the methodological importance of collaborating with local researchers, we argue that the main value of citizen social science is not its effectiveness in collecting data, but the fact that it can help us think in new ways about the purpose of social research and how it leads to positive outcomes.

Drawing on two years of experience of leading a citizen science team in the Hamra neighbourhood of Beirut, Lebanon, we argue that sustained collaboration with citizen scientists is not just a way of doing social research, but also a mechanism for adapting the research agenda and its envisaged outcomes to the challenges that communities face every day. What we mean by a sustained collaboration is a partnership that encompasses multiple phases of a project (see Goodson and Phillimore 2010: 495), in a way that fully integrates citizen scientists into the research team. In the case of our work, this includes research design, data collection, data processing and analysis, presentation of findings at workshops and other events, writing of outputs and publications, design of data-informed interventions, and building and implementation of intervention projects. The aim of these activities is not only the publication of new findings and ideas (as is often the case with projects in the social sciences), but also the co-creation of data sets, partnerships, policy recommendations and urban interventions that are needed to monitor progress on locally relevant issues, hold stakeholders and government institutions to account, and create solutions to local challenges.

The idea that citizen science leads to positive outcomes for communities is in no way new, and it has been put forth by scholars in a range of academic disciplines. For example, in their work on participatory methods in environmental research, Garnett et al. argue that participatory methods must lead to 'enhanced local capacity', 'effective implementation of research results' and 'greater equity in intellectual power-sharing', among other things (2009:

571). O'Fallon and Dearry (2002), working in the health sciences, similarly argue that participatory research leads to 'a number of benefits […] for both academic researchers and community members' (157). These include 'increased relevance of research questions' which makes the research more responsive to community health needs, 'increased dissemination' which allows a greater number of people to benefit from the research findings, and the building of 'infrastructure and sustainability' whereby '[r]esidents acquire new skills and become leaders within the community, which leads to sustainability of a project' (2002: 158). To offer yet another example, Goodson and Phillimore (2010), writing in an article about collaboration with Refugee Community Organizations (RCOs) in Birmingham, UK, explain that 'the community research approach aims to empower community members to shape and have some ownership of the research agenda' (2010: 489-501). This aim was achieved not only by building the skills and confidence of the community researchers, but also by ensuring that 'the evidence collected in this project was truly embedded in the concerns of the RCOs and the communities they served' (2010: 495).

Arguments for the importance of positive outcomes for communities are part of a broader debate about power and inequality in the practice of participatory research. On the one hand, participatory research is often seen as a way of 'empowering' communities, 'democratising' knowledge production, and making the research process more 'inclusive' in order to counter the traditionally asymmetrical power relation between the researcher and the people and communities where the study takes place (e.g. Edwards and Alexander 2011: 271). On the other hand, some authors have pointed out that there are serious dangers that participatory methods can become exploitative – in some cases with neo-colonial tendencies – whereby university academics benefit from citizens' knowledge, skills, networks, and labour, without offering adequate remuneration, recognition, and sharing of the benefits of the research (e.g. Elliott et al 2002: 175-6, Garnett et al 2009: 571). Eva Elliott and her colleagues, for

example, have argued that there is a 'fine line between involving and empowering people on the one hand, and exploiting their labour and expertise on the other' (Elliott et al 2002: 175). One way of approaching this problem is by offering citizen scientists fair remuneration and other benefits such as training, acknowledgment and recognition. This is an important point, but it does not go far enough in making the research process democratic and inclusive. Remuneration and recognition are essential in our view, but they are only an ethical and administrative basis for collaboration. As such, they must be complemented by larger structural measures that firstly define the purpose of the research in a more collaborative fashion and, secondly, create long-term visions in which community members actively expand and build on research outcomes. Paying researchers for their long hours of work is a basic ethical obligation, and it is also something that is addressed administratively as an issue of budgeting and resourcing. A more structurally pertinent issue is the way in which the role of citizen science is envisaged in the broader aims and outcomes of social science research, and how the latter is expected to benefit citizen scientists as well as their communities.

The question of beneficial outcomes is closely related to the question of participation and the extent to which citizen scientists are engaged in the process of research and impact. As Muki Haklay (2013) shows in his topology of different levels of participation, citizen scientists can be more or less active depending on how the collaboration is organized. Haklay presents four levels of participation. The first of these is 'crowdsourcing', where participants act as 'sensors' who capture data with minimal cognitive engagement. At the second level, 'distributed intelligence', citizen scientists are interpreters who are 'asked to take some basic training, and then collect data or carry out a simple interpretation activity' (2013: 117). The third level, 'participatory science', involves participants in problem definition in addition to data collection, and this is done with the assistance of experts who are active in consulting the

citizen scientists and guiding the process. Finally, the highest degree of participation in Haklay's topography is 'collaborative science' or 'extreme citizen science':

> collaborative science is a completely integrated activity, as it is in parts of astronomy where professional and non-professional scientists are involved in deciding on which scientific problems to work on and the nature of the data collection so it is valid and answers the needs of scientific protocols while matching the motivations and interests of the participants. The participants can choose their level of engagement and can be potentially involved in the analysis and publication or utilisation of results. This form of citizen science can be termed 'extreme citizen science' and requires that scientists act as facilitators, in addition to their role as experts (2013: 117).

Haklay's topology, as the reference to astronomy suggests, focuses on citizen science in the natural sciences rather than the social sciences. Projects in this area often rely on large groups of citizen scientists (sometimes reaching hundreds and even thousands of individuals) who participate as volunteers. As the growing literature on citizen social science demonstrates, mass participation through sensory data input and other activities can also be used for social science research on issues such as urban stress and wellbeing, among others (Pykett et al. 2020, see also Albert et al. 2021, Housley et al. 2014). For some authors, however, the concept of citizen social science represents a higher form of participation. For example, in their work on public involvement in addressing climate change, Kythreotis et al. (2019) argue that citizen social science represents a fifth level in Haklay's topology, whereby '[c]o-production or co-learning […] moves beyond conventional public engagement and makes the citizens initiate action and policy responses based on their specific forms of social knowing and values' (2019: 4). Citizen social science, at this level of participation, becomes a means of policy change through the action of citizens.

The version of citizen social science that we present here builds on this work by showing how high levels of participation can be achieved in the development of solutions for sustainable prosperity and improved quality of life. Our work in Hamra was a 'deep dive' study focused on a small area. In order to carry it out, we worked in a small team – varying in size from 6 to

12 citizen scientists as people joined and left the project – that was suited for an intense program of detailed research and action within Hamra, rather than data sets for a larger area. As we explain below in the 'Methodology and Research Activities' section, our small team was able to survey a neighbourhood of 634 buildings and complete household surveys for a representative sample of 688 households, among other accomplishments. This required stamina and determination as well as close coordination amongst team members in order to mitigate difficulties faced on the ground. Such a 'deep dive' approach offered opportunities for deeper collaboration. It strengthened the relationship between project staff and citizen scientists, and this, in turn, made the process of co-design feel more meaningful for everyone involved.

One of our aims in the development of this approach was to expand the existing alternatives to traditional academic practices that demand adherence to narrow and inflexible pre-defined outcomes which focus heavily on academic publications. As Christine Stanton points out '[a]cademia continues to privilege individual merit and hierarchical prestige, research methodologies that adhere to preconceived procedures and discursive norms, and work that culminates in publication and institutional recognition' (2014: 573, see also Albert et al. 2021: 134). While this mode of operation does not define all of academia, as the abundant examples of participatory projects clearly indicate, it is nevertheless a prevalent feature of social science research today. This prevalence can stifle collaboration, and lead to mistrust and scepticism about the relevance of academic research to the challenges that people face in their daily lives (see Soler and Gomez 2020). Reaching out to people beyond the academy, finding a shared language, and articulating a shared visions of progress are all essential for redressing these challenges and they must be taken seriously by university academics.

Two ways of collaborating with citizen social scientists

Citizen science presents an opportunity to develop new forms of sociality between researchers and members of the public, but it does not automatically lead to more engaged and collaborative ways of working. Let's consider for a moment how the two aspects of citizen science described earlier – the contribution that it makes to research, on the one hand, and the benefits that it brings to communities on the other – can relate to one another in different ways depending on the envisaged outcome of the research. If the primary envisaged outcome is pre-determined or pre-designed – for example as knowledge production and dissemination in the form of academic conference presentations, peer-reviewed journal articles and so forth – then the relationship is likely to take on a structure dominated by exchange of resources and services, a *quid pro quo* or a 'something for something'. Within this dynamic, the academic lead acquires the data that he or she needs to produce the envisaged pre-designed outputs, while offering in return something else that is of value to the citizen scientists (e.g. remuneration, training, accreditation for a training course, co-authorship on publications etc.). The ethical imperatives to 'democratise', 'empower', and be 'inclusive' become a matter of concession. This means that the participation of local researchers demands that the project lead shares his or her resources through remuneration and recognition for the contributions of the researchers, but the aim of the research itself does not change as a result of the collaboration.

Alternatively, if the envisaged outcome is a co-designed initiative that identifies and addresses a local challenge – for example, an urban intervention that improves a public space – then the relationship is not structured by exchange, but rather by a shared aspiration to deliver positive change. This, of course, is not a substitute for fair remuneration and acknowledgment/recognition, but rather a structural feature of the way in which the goals of the research – and the collaborations through which they are delivered – are organised. Instead of starting with a decision about how much, or how little, community members should

participate in the delivery of pre-defined goals, a co-designed citizen science approach starts with the premise that participation is essential for defining the goal and a decision must be made collectively about what the goals of a project ought to be. Consequently, this is not a collaboration that is based on concessions aiming to 'democratise' knowledge production, but a collaboration in which the design and delivery of a project are by definition impossible unless they are locally driven. The aim of co-design, as we understand it, is to enable a multitude of actors to come together and establish a shared agenda involving multiple contributors, rather than to exchange resources in a bid to complete a set of pre-existing goals.

The two structures of collaboration we have outlined – respectively dominated by exchange and co-design – are not mutually exclusive. Furthermore, co-designed initiatives should not be seen as substitutes for scholarly publication but rather as parallel outcomes that take place alongside publication. Citizen science research projects are complex and multi-faceted: they involve multiple activities that take place at different stages in time, as well as multiple sensibilities related to ethics, politics, and resource distribution, that are tied to conditions set by funders and universities, political cultures in the sites of inquiry, and practicalities of working with diverse teams of people with different expectations and motivations. This means that transactions or exchanges of resources and services are inevitably an important part of the operations of any project, regardless of the kind of collaboration it aspires to create. Our argument is not that co-design is a substitute to that but rather a guiding principle of collaboration that should be embedded as far as possible throughout the different phases of projects.

In the context of our work in Lebanon, the need for a collaborative approach to research was vividly conveyed to us at a RELIEF Centre workshop in 2017, exploring the landscape of community-based practices in academic and NGO-led research (see RELIEF Centre 2017). The participants of the workshop included academics and representatives of NGOs, as well as

people who had worked as field researchers. The stories that participants shared emphasised lack of voice, as well as embarrassment and frustration in the work of field researchers. Stories depicted how field researchers were hired to carry out data collection – often in socially and culturally sensitive contexts with vulnerable populations – without having any say about what questions should be asked or any other aspect of the research process. Field researchers thus felt pressured or forced to ask questions that they saw as inappropriate and offensive, making them feel alienated from the research they were conducting, as well as from the people they were interviewing.

This discussion signalled the need to adopt a more inclusive approach to research, by embedding partnership and co-design from the outset of our work, and making them a central part of our programme. In the remainder of this paper, we detail the conceptual framework of our research design, together with the core activities that we undertook as a team with citizen scientists. By sharing our experience we hope to demonstrate that a citizen science approach based on co-design and sustained collaboration both requires and produces new ways of thinking about the purpose of social science. It forces us to move away, at least in part, from pre-defined goals and to instead emphasise the principles of openness, partnership and participation in the design of solutions to local challenges. We conclude the article by arguing that citizen science should be a fundamental part of social science research in a post-Covid world where local initiatives will be crucial for building more resilient, prosperous and inclusive communities.

Understanding prosperity through citizen social science

The starting aim of our research in Hamra was to understand what prosperity means for people in the neighbourhood and to work with local residents and organizations towards pathways to more prosperous futures. This research programme is part of the work of the RELIEF Centre,

which is a collaboration led by the Institute for Global Prosperity (IGP) at University College London (UCL), with partners in a number of departments at UCL, the American University of Beirut (AUB) and the Lebanese American University.

Since this project commenced in 2017, Lebanon has experienced a number of major transformations including a nationwide political revolution that began in October 2019, a major economic crisis and currency devaluation, a series of Covid-related lockdowns, and a devastating blast at the port of Beirut that caused deaths, injuries and damage throughout the city. The relevance of research on prosperity in this context warrants some consideration. On the one hand, discussions about prosperity at the present moment can seem disconnected from people's lived reality of hardship, frustration, and grief. At the same time, however, a rethinking of the concept, in line with recent academic and policy debates (e.g. Jackson 2014, Moore 2015, Moore & Woodcraft 2019) can make prosperity a useful lens for conceptualising economic and urban recovery, even at a time of severe crisis. The concept of prosperity, as we understand it, does not mean economic wealth and opulence as is often assumed; rather, it represents the things that people need in order to live the lives they want to live in the kinds of environments that they want to live in. Prosperity, understood in this way, is about provisions that lead to improved quality of life, from clean and affordable public services such as electricity and water, to affordable education and jobs with a living wage. In the context of post-crisis recovery, the aim of research about prosperity is to bring into focus local challenges to quality of life which are often left unaddressed by large-scale economic initiatives and infrastructural projects. As Lebanon's history of post-war reconstruction suggests, the large-scale projects that have stood at the centre of the country's recovery efforts since the 1990s have focused on high-end investment which has not been particularly successful in improving life for most of the country's residents (e.g. Krijnen and Fawaz 2010, Sakr-Tierney 2017, Sawalha 2010).

Prosperity, furthermore, is a multifaceted concept that entails different things depending on the context in which it is defined and operationalised. A diversity of social, economic, political and cultural experiences across space and time means that people hold different visions of what it means to live a decent and good life. This conceptual plurality, together with the concomitant need to develop a context-specific operational model of prosperity, highlights the importance of co-designed and participatory approaches. Analytical models of prosperity must reflect people's experiences and aspirations. To achieve this, such models must be co-designed by networks of local residents and other stakeholders, rather than created by somebody else on a community's behalf. The same argument applies to programmes of action, whether at the level of policy and governance, or urban interventions and community projects: change must be defined and driven on the basis of experiences and capabilities that are already embedded in, and adapted to, local contexts.

The RELIEF Centre's work on prosperity in Hamra is a multi-dimensional collaboration between a number of actors. Academics, entrepreneurs, NGOs, local businesses and members of the public all play key roles in supporting the research, translating its findings into action, and collaborating with RELIEF staff on various activities such as policy roundtables and citizens' assemblies (Institute for Global Prosperity and Chatham House 2019, Institute for Global Prosperity et al. 2019, Shehabi 2020). Citizen science is only one element of this broader collaboration, but it is a crucial element which is at the centre of the project. Citizen scientists are researchers but they are not constrained by the academic silos, patterns of specialization, and ways of thinking and talking that define traditional academic institutions. This means that research teams with citizen scientists bring together a wide range of knowledges and perspectives – including expertise that are developed through professional and personal experiences outside of the university – in order to adapt academic concepts for context-specific use and break down the distinction between research and impact.

Citizen scientists are not professional researchers and they are not expected to be fully committed to the research. Becoming a citizen scientist on our team does not require any prior training or qualification, nor does it require a fixed and inflexible time commitment. In fact, our team in Hamra includes people with all levels of educational attainment, as well as people of different ages, genders, nationalities and religious and socio-economic backgrounds. What is more, many citizen scientists hold full-time day jobs which limits the amount of time they are able to commit to the project, while others are able to take on larger workloads. What all citizen scientists have in common, however, is a shared commitment to making a positive change to Hamra and its residents, and a belief that this positive change can be achieved through research and evidence on the one hand, and collaboration with local residents and community organizations on the other.

The high level of engagement among the team depends on the character of the citizen scientists as individuals, as well as the nature of activities that are involved in the work. In Hamra, citizen scientists were recruited using the online jobs platform 'Dalil Madani' as well as through contacts of the Neighborhood Initiative at the AUB. At a later stage we also put out an open call advertised on the Neighborhood Initiative's Facebook page, as well as through interested acquaintances of already involved citizen scientists. During the recruitment process it was made clear that this is a research project with rigorous data collection and research components, as well as a need for a strong commitment to making a difference to the area. However, it was only when the research commenced that the team became progressively more engaged through a kind of self-selecting process. Some people left as a result of losing interest in the work or feeling that it was not worthwhile. In a few cases the work simply did not align with people's expectations. Citizen scientists with little or no previous knowledge of research sometimes found the process more difficult and demanding than they anticipated. They also learned that data collection can involve frequent rejection from people not wishing to respond

and this can feel demoralising and diminishing. Social skills and patience were needed in the interaction with interviewees and survey respondents, as well as with colleagues and team members, who sometimes did not get along with one another. Other citizen scientists – including some of the most skilled and engaged members of the group – left for different reasons such as moving to study abroad and not having sufficient time as a result of other personal and professional commitments.

The structure of team management and the process of training, supervision, and collaboration were also a key factor in strengthening levels of engagement. Citizen scientists received training, guidance and supervision from us (the authors), from other RELIEF staff, and from the AUB Neighbourhood Initiative and UN Habitat Lebanon, which were key partners in this programme. One of us in particular, Mayssa, took on the role of Citizen Science Coordinator, offering continuous support with training, co-ordination of surveys, resolution of personal conflicts within the team, data collection in the field, intellectual input in the development of the programme, and anything else that was needed for the management of the team. Full team gatherings such as training sessions, workshops, or simply social events such as dinners or coffee catch-ups were also organized regularly (once every few weeks), first in person, prior to the pandemic, and then virtually once the pandemic started.

The training process covered multiple themes and skills that the citizen scientists needed to conduct social research – from research ethics and risk management, to structured and semi-structured interviews, infrastructure and household surveys, and GIS mapping. In addition to set training sessions, support on the ground was available as well, and citizen scientists were paired with project staff until they gained the experience and confidence to collect data on their own. Crucially, research training in this context, plays a very different role from standard professional academic training. Given the diversity of professional backgrounds and life experiences that the citizen scientists already possessed, training was not intended to

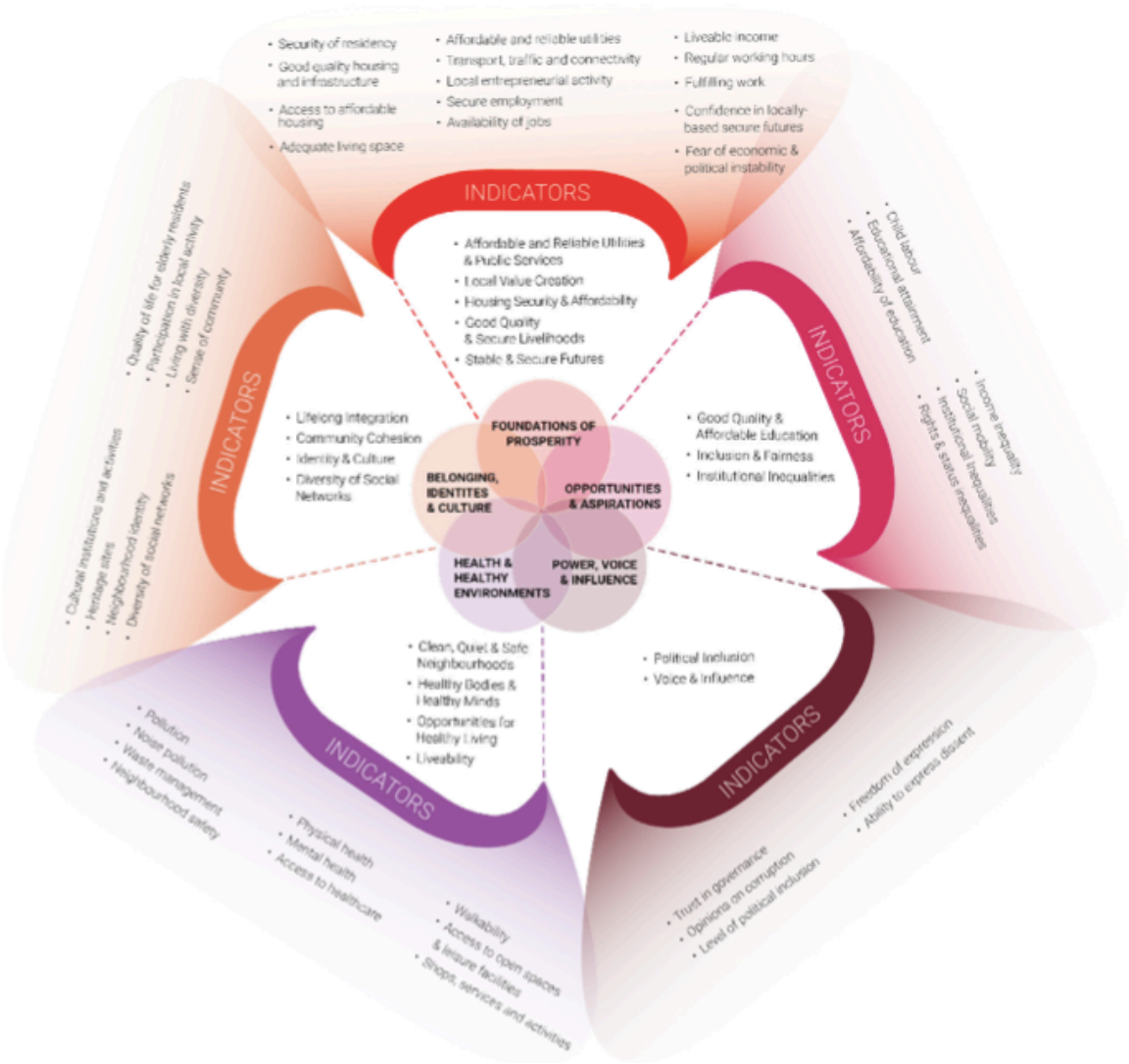
produce professional academics, but rather to offer people a set of skills that would enhance collaboration and allow members of the community to work together as part of a shared programme for prosperity. The primary knowledges and skills that people needed to make a positive contribution were already present within the team, and this was not because of the training that we offered. For a citizen scientist who is a teacher or an engineer, or someone who has lived in the area for much of their life, the primary function of the training was not to create expertise and knowledges, but rather to strengthen the possibilities to coordinate with others in a way that allows team members to use what they already know to deliver positive outcomes for their area. This view resonates with our understanding of prosperity as an assemblage (Moore and Mintchev 2021), in which diverse actors come together to form communities of practice and coordinate with one another to produce innovative solutions to existing local problems.

Methodology and research activities

Our research programme on prosperity in Hamra consisted of three parts or stages: (1) consultation and concept-definition, (2) data collection, and (3) intervention design. Each of these stages was carried out in collaboration with citizen scientists. Data analysis, presentation of findings, and writing and publication were integrated into the activities of the team at different points throughout the research process.

The first stage – consultation and concept-definition – aimed to develop an operational model of prosperity for Hamra based on qualitative data collection about the things that local residents saw as essential for a decent and good quality of life in Hamra. This included positive aspects of life in the neighbourhood as well as challenges that the neighbourhood and its residents face. This stage consisted of a series of data collection activities with a range of stakeholders – street interviews with local residents (n=23) carried out by one of the authors

and two research assistants, two workshops at the American University of Beirut with academics and NGOs who have done research in Hamra, three workshop discussions on the views of the citizen scientists about the meaning of prosperity, and a second round of interviews with Hamra residents (n=20) conducted by the citizen scientists. By the time of the second round of interviews, our data had reached a point of saturation where no new themes and issues were brought up by interviewees and participants. The qualitative data from these activities – together with a review of the academic literature about the area – provided the material for the Hamra Prosperity Model. The model included 18 headline themes and 44 sub-themes (see Figure 1). The themes were then organized and visualised in relation to the IGP's five domains of prosperity: (1) 'belonging, identities & culture', (2) 'health & healthy environments', (3) 'foundations of prosperity' (referring to key aspects of material security that support the possibility of a good life and strengthen other elements of prosperity) (4) 'opportunities & aspirations', and (5) 'power, voice & influence'. The five domains, which were developed by IGP, have been used to organize and visualise the issues that define prosperity in IGP research sites in London (UK), Dar es Salaam (Tanzania), and Elgeyo Marakwet (Kenya) (see, Moore and Woodcraft 2019, Woodcraft et al 2020). As such they provide a basis for comparative analysis of prosperity in a diverse range of contexts. The Hamra Prosperity Model uses this five-domain structure as an organising framework, but it draws on context-specific data to define what each of the five domains looks like in Hamra. The context-specific data is summarized in the indicators, which are an integral part of the design and visualization of the Hamra Prosperity Model. Figure 1 presents a visualisation which was co-designed with the citizen scientists to best represent how they envisaged the character of the Hamra neighbourhood.



[Figure 1: Hamra prosperity model with indicators]

The second stage – data collection – involved a series of surveys and interviews. The main part of this stage was a household survey on prosperity in Hamra, which was designed to reflect the prosperity model developed in Stage 1. A total of 231 household survey questions were created on the basis of the indicators that were developed in the first phase of qualitative research. The household survey on prosperity covered themes including but not limited to

livelihoods, housing, health, education, socio-political activism and confidence in governance. The citizen scientists in the team were specifically consulted on the formulation of the questions for the survey at two workshops, providing input about the relevance of the survey questions, as well as the most appropriate phrasing and use of language in the questionnaire.

In addition to a household survey for which we collected data for a representative sample of 688 households, our team conducted a number of other surveys which we adapted from the methodology that our partners UN Habitat and UNICEF Lebanon have used for their 'neigbhourhood profiles' of vulnerable neighbourhoods across the country (e.g. UN Habitat 2017). Additional data collection activities included the following:

- a building survey recording the size, age, and condition of every building in the neighbourhood (n=634)
- a population count of all the residents who inhabit each building (usually provided by the *natour* or one of the building's residents)
- 'key informant' interviews' (n=17) with representatives of NGOs, Mokhtars (government-employed administrative officials), representatives of religious institutions, and a representative of a locally prominent political party
- an interview with the mayor of Beirut and an interview with a municipal engineer
- an infrastructure and open spaces survey, providing assessment of street-level infrastructure including domestic water network, wastewater network, storm water drainage network, electrical network, open spaces, and roads and sidewalks
- an enterprise survey of 300 local businesses on their age, tenure type (owned versus rented), customer catchment area, and gender and nationality of owner and employees.

- semi-structured interviews with enterprise owners (n=19), officials from local schools (n=3), and officials from local health clinics (n=2)
- focus group discussions with members of different demographic groups based on age, gender and nationality (n=9)

A detailed report of the key findings from this research has been published elsewhere (RELIEF Centre and UN Habitat 2020), so we do not present any findings here. What we focus on, instead, is the way in which a citizen science approach to data collection and analysis contributes to the larger ethos of co-design and the re-envisaging of the purpose of research.

Data collection is a gruelling process, especially when it is as comprehensive as the programme that our team completed. The fact that data is collected by citizen scientists – rather than 'data collectors' or 'enumerators' – does not make the work any less demanding. In fact, citizen science requires additional training and supervision, especially if the majority of team members have no prior experience with surveys and interviews. Data analysis also requires additional training sessions in spatial (GIS) and statistical analysis.

[Image 1: Citizen scientist training session at the Lebanese American University]

However, the key difference between citizen science and data collection by specialist enumerators, is not in the types of activities or skills that are needed to complete the process; rather, the key difference is that citizen science broadens the horizon of engagement and purpose in the practice of data collection. Citizen scientists are already familiar with the neighbourhoods where they work, and their involvement is often driven by a deep commitment to making a difference to the communities that they know and care about. Such commitment strengthens the human side of data collection – the fact that surveys and interviews are not just an exercise in capturing numbers and narratives, but also experiences of encounter with real places and people. Although this point is well-known with respect to qualitative methods (especially ethnography), it is rarely, if ever, discussed with regard to quantitative survey methods. Data collection in social research – whether qualitative or quantitative – is an

affective experience that can make researchers attuned to the vulnerabilities, strengths, struggles and aspirations that people live with (see Jallad and Mintchev 2019, Shourbaji 2020). Data analysis can too have a powerful affective dimension, although unlike fieldwork on the ground, it does not involve live encounters with people and places. Analysing data and producing data outputs is also a form of engagement in which citizen scientists learn about their neighbourhood while simultaneously producing knowledge about it, including findings they did not previously known about, even as locals.

One of the central assumptions of our approach to citizen science is that a deep understanding of the site of research – both in terms of lived experience and knowledge of the data – makes the people involved particularly well-positioned to make informed decisions about future initiatives deriving from the research. This assumption forms the basis of the third stage of our work, which is the design of small-scale interventions led by the citizen scientists. Working on data collection and first phases of analysis strengthened our team's commitment to the research and motivated team members to identify possible areas of intervention and explore ways of investing the knowledge that they gained into practical solutions to existing challenges. In response to this, we convened a workshop to brainstorm intervention ideas. Team members were asked to identify one challenge from the data that they had collected and worked on, and to present an idea for a possible intervention. The workshop was a success. It gave everyone on the team a clear indication that the research process had catalysed a range of original ideas about interventions that were both viable and relevant to the current context. Team members with similar ideas then formed three teams of two to three people and began working on more detailed intervention designs and proposals.

[Image 2: Team discussion of intervention proposals at AUB Neighbourhood Initiative]

In the twelve months following the initial workshop in October 2019, we held a series of follow-up workshops in which we collectively discussed and brainstormed ways of improving each intervention, adapting it to the Covid-pandemic, and producing detailed plans, budgets and timelines for implementation. External experts were also invited to discuss the interventions and offer feedback on each intervention proposal. Following multiple rounds of revision and adaptation, each of the three teams presented their proposals at a public online event with a panel of academics and practitioners who discussed the interventions. The three presentations can be viewed online (RELIEF Centre 2020) and the details of the interventions will be published in future outputs. For this reason we will not discuss them here, other than to outline that they respectively aim to (1) improve the visibility of small workshops and enterprises that are struggling in the current economic climate, (2) build installations for urban

agriculture and greening, and (3) provide online educational support for children who are currently out of school and at risk of falling behind in their education. At the time of writing (late 2020), the RELIEF Centre has committed the funding for the citizen scientists to build and implement all three interventions in Hamra, and we are currently working with each team on carrying out the initial phases.

Conclusion: citizen social science and post-crisis recovery

The citizen science research programme described in this paper is part of the authors' longstanding effort to think in new ways about how research can be used to build pathways to prosperity in different contexts. The collaborative work that we undertook in Hamra built upon a number of experiences, networks and partnerships: previous experiences within our team of training and coordinating citizen scientists and field researchers in Lebanon, Kenya and the UK; local networks and friendships that helped us recruit a team of committed and highly capable citizen scientists; partnerships with trusted institutions such as the AUB Neighbourhood Initiative, the Centre for Lebanese Studies and UN Habitat, which helped us with generous offers of facilities where we could carry out our training sessions and workshops, in addition to providing other forms of support and guidance; and, last but not least, the learning of invaluable lessons from collaboration with organisations such as CatalyticAction who specialise in co-designed placemaking and community-led spatial interventions across Lebanon (see Dabaj et al. 2020, Mintchev et al. 2019)

Our effort to think in new ways about the impact of social science research has both preceded and followed the practical dimension of working with citizen scientists and other partners on the ground in Beirut. Our intellectual or conceptual work, on the one hand, and our practical work on the other, have developed simultaneously and informed one another throughout the course of the project. Although we planned from the outset of the project that

citizen science would play a key role in what we do, the parameters of what is possible, the kinds of activities that would take place, the kinds of outcomes that the activities would lead to, and the precise role of citizen scientists in producing these outcomes were defined and developed over time as the project progressed. This could not have been otherwise, given that each research context presents different possibilities and challenges, nor do we think that it should have been otherwise, considering that the *process* of co-developing a research programme is just as important as the outcome.

This last point has important implications for the possibilities to replicate this model of collaboration elsewhere. We acknowledge that different countries, cities and neighbourhoods present different opportunities for collaborative research depending on various cultural, economic, political and environmental factors. Yet, despite this, we hold that the principles that guide the work we present in this article are widely applicable to a diverse range of settings where social research takes place on the ground. These principles include involving members of the community in research and impact activities throughout the duration of projects (from project design, data collection and analysis to publication and intervention designs), being flexible and adaptable in the co-design of these activities, and approaching the process as a long-term partnership rather than a process of hiring researchers to complete a given task. In addition to this, we would highlight the importance of combining traditional academic research with the skills and knowledge that citizen scientists bring as a result of their unique education, expertise, career trajectories, and life experiences. A co-designed approach to research and impact foregrounds the value of diverse capabilities and links this to academic research and research-based interventions in order to coordinate solutions to existing challenges, whatever these may be in a given context. This is fundamentally different from designing a rigid scheme in which research training is devised to fulfil pre-defined outcomes that leave little or no room for decision-making by anyone other than the academic leads of research projects.

In conclusion, we return to the present moment and the challenges that the Covid-19 pandemic has posed for social science research. Partnership with citizen scientists based in the sites of inquiry can be enormously valuable for sustaining a research project in the face of Covid-related disruptions. More importantly, however, citizen science is a mechanism for making social science research and the capabilities it builds more relevant to local needs, and better adapted to contribute to recovery efforts, not only in the context of Covid, but also with regard to other kinds of crises. Citizen science is a mechanism of embedding the values that research projects generate – from multi-stakeholder partnerships, to research skills, and knowledge of data sets – within the communities where the research takes place. It is also a mechanism for co-designing interventions that resonate with what matters to people on the ground, rather than with the priorities of academics, governments, or private companies. And while we are aware that the work we have presented here is only a small initiative in the face of a major economic crisis and a global pandemic, our hope is that the difference it makes will be a small step in the right direction of contributing to Hamra's post-Covid recovery as well as the way in which we think about the impact of the social sciences.

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