Editorial Note – *Nota Editorial*

DISASTER GOVERNANCE AND COLLECTIVE INTELLIGENCES OF CONSTRUCTION AND DESIGN IN CITIES OF THE GLOBAL SOUTH: IDEAS AND QUESTIONS FOR FURTHER RESEARCH

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ABSTRACT

This note explores some relationships between disaster governance and collective intelligences linked to the construction and design of products in cities of the Global South, while it offers some reflections for future research. The ideas presented in this work are the result of a series of round tables that took place in 2021 among a group of specialists in the area of disaster studies and collective intelligence. The methodology was based on previously discussed topics and guiding questions to explore such linkages: Do collective intelligences have the power to transform higher social structures in the field of construction and risk management?; How can (formal) disaster and urban governance deal with collective intelligences? The results were systematised and summarised in this work. Some results point out to the need to connect urban development, disaster governance, collective intelligences, and architectural production for future research and practice. Timely and contextualised urban solutions that maximise the (re)use of scarce community resources could be a good alternative to meet the growing demand for housing and new products that solve basic problems and at the same time strengthen resilience to disasters.

KEYWORDS

Collective intelligences; Urban governance; Disaster governance; Risk governance; Global south; Urban informality

GOBERNANZA DE DESASTRES E INTELIGENCIAS COLECTIVAS RELACIONADAS A LA CONSTRUCCIÓN Y DISEÑO EN CIUDADES DEL SUR GLOBAL: IDEAS Y PREGUNTAS PARA FUTURAS INVESTIGACIONES

RESUMEN

Esta nota explora algunos vínculos entre la gobernanza de desastres y las inteligencias colectivas vinculadas a la construcción y diseño de productos en ciudades del Sur Global, al tiempo que ofrece algunas reflexiones para futuras investigaciones. Las ideas presentadas en este trabajo son el resultado de una serie de mesas redondas ocurridas el 2021 entre un grupo de especialistas en el área de estudios sobre desastres e inteligencias colectivas. La metodología se basó en temas discutidos previamente y preguntas orientadoras para explorar tales vínculos: ¿Tienen las inteligencias colectivas el poder de transformar estructuras sociales superiores en el ámbito de la construcción y la gestión del riesgo?; ¿cómo puede la gobernanza (formal) de los desastres y la urbana tratar con las inteligencias colectivas? Los resultados fueron sistematizados y resumidos en este trabajo. Algunos resultados señalan la necesidad de conectar el desarrollo urbano, la gobernanza de desastres, las inteligencias colectivas y la producción arquitectónica para futuras investigaciones y prácticas. Soluciones urbanas oportunas y contextualizadas que maximicen la (re)utilización de los escasos recursos comunitarios podrían ser una buena alternativa para atender la creciente demanda de vivienda y nuevos productos que resuelvan problemas básicos y al mismo tiempo fortalezcan la resiliencia ante desastres.

PALABRAS CLAVES

Inteligencias colectivas; Gobernanza urbana; Gobernanza de desastres; Gobernanza del riesgo; Sur global; Informalidad urbana

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DOI:
http://doi.org/10.55467/reder.v6i2.99

RECEIVED
15 February 2022

PUBLISHED
1 July 2022

Recommended citation (APA style):
Sandoval, V., González-Muzzio, C., Valdivia Steel, L., Jódar, R., Durant Vidal, M., Rodríguez Barrera, N., Voss, M. & van Rijs, J. (2022). Disaster Governance and Collective Intelligences of Construction and Design in Cities of the Global South: Ideas and Questions for Further Research. *Revista de Estudios Latinoamericanos sobre Reducción del Riesgo de Desastres REDER*, 6(2), 115-124. http://doi.org/10.55467/reder.v6i2.99

Journal of Latin American Studies on Disaster Risk Reduction (REDER)

Revista de Estudios Latinoamericanos sobre Reducción del Riesgo de Desastres (REDER)

Design: Lupe Bezzina

INTRODUCTION

A group of specialists (the authors) met in a series of roundtables during 2021 to share experiences and discuss around disaster governance and collective intelligences of construction and design solutions in cities of the Global South. Then, this paper summaries the discussion, follow up exchange, and delineates ideas and questions that seek informing further investigations and research agendas at the interplay between these two fields. The roundtables were intentionally designed with the idea of finding common grounds between researchers and practitioners working in disaster studies and collective intelligences and sought to examine potential crossroads. The roundtables initiated with an introduction to urban disaster risk governance in the Latin American and the Caribbean (LAC) region, with emphasis on informal settlements and precariousness, and continued with the experiences of the initiators of the social database of urban techniques called Inteligencias Colectivas (collective intelligences, in Spanish). Predesigned questions aimed to guide the discussion: Do collective intelligences have the power to transform upper, larger, or dominant societal structures? (i.e., in building and design, emergency housing, and in disaster risk reduction) and; How (formal) disaster and urban governance may deal with collective intelligences? Are they reinforced or diminish by powerful actors? The meetings were recorded, and the discussion and follow up exchange of ideas systematised and summarised in this work.

The series of roundtables occurred between December 2020 and August 2021 organised by the research-action project *International Network for Collective Intelligences in Latin America and the Caribbean (INCI)*, initiated by Rubén Jódar and Lorena Valdivia, researcher at Chair FGVANR, TU-Berlin and Vicente Sandoval, researcher at Disaster Research Unit, FU-Berlin, in partnership with the social platform Zoohaus, the database of urban techniques InteligenciasColectivas.org, the Technological University of Havana José Antonio Echeverría (CUJAE), and the Fábrica de Arte Cubano, Cuba. The project was funded by the Berlin Center for Global Engagement, Berlin University Alliance. The INCI project is an inter-institutional research network and implementation project in the field of design and building science with the objective to improve innovation in sustainability by the identification, formulation and divulgation of small-scale, climate-positive design and construction methods that contribute to the sustainable development of tomorrow's urban and rural structures, and disaster risk reduction, especially in line with traditional building methods.

DISASTER GOVERNANCE, INFORMAL SETTLEMENTS, AND COLLECTIVE INTELLIGENCES IN ARCHITECTURE

According to Tierney (2012), the concept of (disaster risk) governance recognises that functions that may formerly have been carried out by public entities are now frequently dispersed among a multiplicity of actors that include not only governmental institutions but also private-sector and civil society entities. In certain way, the governance of disaster risks is the *software* that enables the urban *hardware* to function in relation to safety from natural hazards, that is, the cultural, socio-economic, and political relationships that influence decision-making in relation to disaster risk: from its creation to its reduction. Then, disaster governance encompasses actors and mechanisms, formally and informally established, that participate in creating, managing, and reducing disaster risks. These relationships are vividly expressed in many cities of the Global South, where underlying and complex processes of rapid urbanisations and social exclusion (Sassen, 2014), have relegated millions of people to live in precarious and unsafe conditions.

Around 80 percent of people in Latin American and the Caribbean (LAC) live in urban areas (about 500 million in total), while 21.1 percent of this urban population resides in precarious neighbourhoods (Cárdenas & Guzmán Ayala, 2020), sometimes called informal settlements or slums. According to UN-Habitat (2016), slums dwellers usually have no security of tenure vis-à-vis the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing. Likewise, informal settlements generally lack, or are cut off from, basic services and city infrastructure. Moreover, housing units often do not comply with current planning and building regulations and is often situated in geographically and environmentally hazardous areas. This is the reality for about 106 million people in the LAC region (Sandoval & Sarmiento, 2020), where urban precariousness and exposure to natural hazards could be a dangerous cocktail for disaster: LAC is the second most disaster-prone region in the world with 152 million people affected by 1,205 disasters between 2000 and 2019 (UN-OCHA, 2020). Additionally, ECLAC (2020) estimated

that due to the COVID-19 pandemic the number of people living in extreme poverty has increased by 28.5 million, from 67.7 million in 2019 to 96.2 million in 2020, equivalent to 15.5% of the total population. Hence, COVID-19 impacts will also translate into greater pressures to cities and its governance.

In the Global South, and particularly in the LAC region, rapid economic development and demographic changes are exerting pressure over cities, increasing dramatically the demand for new spaces for living. Since potentially up to 3 billion people will live in slums by 2050 – over 160 million in Latin America and the Caribbean –, new, rapidly deployable solutions for do-it-yourself construction are urgently needed. These solutions must be socially acceptable and at the same time address the Sustainable Development Goals (SDGs) in a meaningful way. Traditional craft and crossbreed techniques, modified machines and self-made devices but also tacit citizenship agreements for public togetherness are pure open-source collective intelligences, taught by imitation, developed over generations and perfected through appropriation, imitation and self-experimentation. This knowledge is becoming invisible, has fallen into discredit and/or gradually being discarded under globalised standardisation of processes and a conception of progress.

The belief that all critical problems in our cities, from climate change adaptation to informal settlements and disaster risk reduction, could only be solved through *technical* and *engineering* points of views, contributed to a shift in construction methods in the middle of the twentieth century. Massive construction techniques of traditional Latin American architecture were replaced by an often minimal, reinforced concrete skeleton construction, loosely filled with perforated bricks or concrete blocks. This construction method was intended to be more resistant to *disasters* but tended to neglect climatic and ecological aspects as well as of urban public spaces. In architectural terms, the growing- or '*expanding-house*' described by Ribbeck in 2002 is the result from this self-construction development in the Latin American metropolises. The self-constructed expanding-house is adaptable to any change in life, allowing for a minimal existence and accommodating shifting family circumstances (Ribbeck, 2002). Thus, it is a survival practice of the urban masses, tested for decades, that insistently conquers not only a piece of living space but also a piece of the city and makes it habitable. Due to a widespread lack of urban infrastructure in most of Latin American cities, self-construction practices have also served as 'self-help urban development' (Ribbeck, 2002).

On the other hand, if this generally preferred construction methods in Latin America rapidly shift to integrate new insulation materials and use a large amount of concrete, as in the European model, it may represent a step backward against efforts to reduce climate change and its impacts. The cement –the key ingredient in concrete– has shaped much of our built environment, but it also has a massive carbon footprint. In 2014, an IPCC report found that the cement production is responsible alone for up to 7.2 percent of global CO2 emissions (Fischedick et al., 2014). Then, only the use of renewable raw materials in combination with *intelligent* building concepts can make an effective contribution to reducing greenhouse gas emissions in the construction sector while helping to solve the ever-growing housing demand in the LAC region.

Although the appropriateness of a north-south transfer of a particular building method must be discussed from the point of view of sustainability, this must also be done without prejudice and with new analytical approaches. This is important considering that are not the poor but the rich cities which are the ones that more land and energy consume in the planet: after all, informal settlements of the Global South are like 'thrift areas' (Ribbeck, 2002) where basic livelihoods are somehow *ensured* for millions with very few resources and low emissions, albeit laboriously and under precarious conditions.

As described by the creators of the Inteligencias Colectivas (2021) platform, every region of the world has its own repertoire of construction and design techniques. The coexistence of different degrees of industrialisation and development allows for the mixing of semi-industrial products with old and enduring techniques. This type of community tacit knowledge is defined here as *collective intelligence in architecture*, based on practical construction and design solutions that tend to only be considered valid in informal environments. While many of these solutions lack proper design planning, they generate a wide range of procedures through popular and generational wisdom.

While the concepts of (community or social) tacit knowledge and collective intelligences encompass similar foci, literature is vast and diverse. In a way of making clearer our conversation,

here we offer some distinctions. Boder (2006) considers that tacit knowledge refers more to *built-in* knowledge within individuals and organisations, where knowledge interactions tend to be coherent within that system. On the other hand, collective intelligence is more problem-oriented knowledge in constant evolution and development, and for that reason, tend to be less coherent within systems. In the field of architecture and design, collective intelligences have recently been studied to interpret the generation of explicit knowledge through internet-based communities that use computational tools, construction techniques, and design methods (Hight & Perry, 2006). In the field of disaster, debates have circulated more about explicit and tacit knowledge, as well as collective intelligences, in the areas of emergency response and disaster management – i.e., post-disaster – (Büscher et al., 2014; Vivacqua & Borges, 2010). This has also included debates about indigenous knowledge (Kelman et al., 2012) and tacit knowledge in disaster risk reduction research and policy – i.e., pre-disaster – (Weichselgartner & Pigeon, 2015). Nevertheless, we have not found concrete or exploratory reflections in the academic literature on how disaster governance (actors and mechanisms) could help to support collective intelligences of construction and design solutions in a way that potentiate people's and communities' capacities for reducing disaster risks in urban areas, especially in formal settlements. Although this working document does not pretend to be an exhaustive examination on the matter, it aims to bring ideas and questions from recent experiences that may help to explore further interrelated issues of urbanisation and disaster risk occurring in several cities of the Global South.

CHALLENGING DOMINANT GOVERNANCE STRUCTURES

We initiate the conversation asking if collective intelligences, in any form, may have the potential to transform, or challenge, dominant societal structures under which they are being restrained or ignored. This first question seeks to explore potential relationships between collective intelligences in architecture and disaster governance structures in urban areas.

According to the participants, collective intelligences in construction and design of practical solutions have the potential to transform dominant governance structures. Larger, upper, and dominant governance structures are initially the ones that generally does not recognise alternative ways of organising and decision-making (i.e., governance), creating an *obscure* space outside the *normal* or *formal*. But informality is not the absence of governance, ordering, decision-making, rules, and so on and forth, but the existence of an alternative – often organic – mode of organisation, sometimes called *emergent responses*, *collective intelligences*, and *informal settlements*. Collective intelligences during disasters may trigger or support *emergent responses* not only to cope with disaster impacts and needs but also to challenge dominant governance structure and to imagine alternative and more inclusive resilient cities. An example recaps about the experiences from the 2010 Maule earthquake in Chile, an 8.8 magnitude (Mw) event that caused about US$ 30 billion in losses and 525 deaths, including about 2 million affected people. Many *emergent* groups, as defined by Quarantelli (1994) and Twigg and Mosel (2017), arose across the country after the disaster in response to the multiple unattended necessities such as shelter, clothing, food, and the like. Some of these organisations then crystallised in foundations, NGOs, and cooperatives over the time until today. Some examples are Procultura (Fundación Procultura, 2021) and Proyecta Memoria (Fundación Proyecta Memoria, 2021). They finally *formalised* their actions, procedures, and mechanisms in political ways aiming to influence public policies related to disaster prevention and resilient neighbourhoods (Gonzalez-Muzzio & Sandoval, 2016).

Collective intelligences have developed too after the Chilean social uprising in October 2019. The 2019-2020 Social Outbreak (*Estallido Social*) was a series of massive demonstrations and severe riots originated in Santiago and spread to all regions of the country. As described by Garcés (2020), the social uprising was a rage accumulated by masses who have lived the daily social precariousness and structural inequality that neoliberal policies configured, materialised, and naturalised in Chilean society – from the Pinochet dictatorship until today. One example is the formation of *piquetes sanitarios*, groups of healthcare workers and students that demonstrated against the government's violence by providing in-situ healthcare to injured and affected protesters (see Figure 1). They made an intensive use of social media and information technologies (i.e., radio transceivers, SMS, etc.) for organisation and action. They also designed artefacts that became very popular among the protesters such as homemade shields from discarded satellite dish antennas

(see Figure 2), which aimed to reduce protesters' injuries from the use of water cannon and rubber bullets by the police (Arias-Loyola, 2021). This and other types of solutions widely spread across social media and internet, being used until today.

Figure 1. Healthcare workers and students join protests in Chile
Source: Cristóbal Saavedra Vogel, Agencia Anadolu, 2019.

Based on experiences from the Inteligencias Colectivas platform on urban resilience in Africa and Latin America (Rubio et al., 2018), its founders assert that different forms of collective intelligences should be always considered in *formal* governance levels, that is, be part of decision making processes. This should be especially considered in urban areas where the lack of (material and economic) resources, social tensions, and development pressures are more evident, such as in informal settlements. A mixture of different intelligences – formal and informal ones – may benefit not only the public administration but communities, private sector, and civil society. Hence, it is important to give value to all different people's needs and to city commons, putting *the life of people* at the centre of all spheres that are related to urban planning, building design, and disaster risk reduction. For that to occur, more opportunities of interactions and to experiment – i.e., 'the right to make mistakes' (Bouvier, 1987) – are urgently needed.

Figure 2. Tutorials of homemade shields from discarded satellite dish antennas in Chile
Source: (left) Paulo Slachevsky, 2020, (centre and right) Philippe Delteil, 2019.
Note: Tutorial is available at https://link.medium.com/PQ7loAjnOgb

Questioning global standardisation to rediscover and integrate collective intelligences – as informal and collaborative solutions to urgent common needs – into dominant views of urban and disaster governance in all stages of urban projects, from design to construction and maintenance, will make solutions more effective and sustainable.

Integrating alternative knowledges and intelligences into formal governance structures can also be seen as a form of community participation that promotes *transdisciplinarity*. For instance, the platform Inteligencias Colectivas has been for more than 10 years experimenting with a variety of urban agents and knowledges, integrating different type of possible solutions and learning to value all different knowledges that people, and communities have (Rubio et al., 2018). This also could make efforts for disaster risk reduction more effective and sustainable, as Sarmiento et al. (2018) recently discovered: the more participation of people at different stages of urban interventions, more community ownership for such interventions.

All in all, Cuba (as part of the INCI project) shows signs of change that may trigger greater opportunities for collective intelligences in urban processes. Cuba's vertical governance structure has historically limited local participation in many different aspects (Irazábal, 2021; Milanés Batista et al., 2020). Nevertheless, the 2019 new constitution has shifted to more participation of local governments on urban development which is creating a totally new situation for change. In the past, prior to 2019, local governments used to receive only 1 percent of the local domestic product, as incomes went directly to the central government. Later, this decided how to territorialise it nationally, regionally, and locally. Hence, local government, and especially local communities, had little opportunities or power over urban future. This has changed with the new constitution, as entrepreneurs, activists, and other agents have now the opportunity to participate and create urban projects, and perhaps to share different knowledges. For example, self-construction of housing and design of products are characteristic processes of the Havana city, turning it into a rich and diverse source of collective intelligences that could benefit urban future.

GOVERNMENTS: DEALING WITH COLLECTIVE INTELLIGENCES

Thinking in a opposite direction, this work delineates open questions on how formal governance structures – i.e., governments, other formal organisations such companies, unions, and the like – deals with collective intelligences in housing construction and design.

In the case of Cuba, with its unique politico-economic and cultural framing, it seems that decision makers at the urban and even national levels directly decide to *ignore* any kind of community knowledge and collective intelligences – according to some specialists' views. Unlike other societies in the region, Cuban decision makers most align any important urban decision to the only one political party – the Communist Party –, thus limiting the opportunity for people to incorporate ideas and knowledges outside this vertical governance (Coyula & Hamberg, 2004). The question that follows is how create new spaces for dialogue between different type of practical knowledges beyond the formal structures of governance, especially when these are vertical and centralised. By inviting decision makers, and other key actors of urban life, to dialogue around cross-cutting urban issues, it would be possible to create the opportunity for them to *value* all kind of knowledge. They will have the chance of at least knowing what is going on with these collective intelligences.

On the other hand, the relationship that local governments may have with all types of collective intelligences is contingent to different contexts. It will depend on the planning foci that each local authority has for each different urban challenge. However, it is important to acknowledge that at the core of urban development, especially if we want *human* cities, collective intelligences – as a valuable source of practical solutions to common urban problems – must be taken into account. In certain way, considering collective intelligences into urban planning can be framed within the Sherry Arnstein's (1969) 'A Ladder of Citizen Participation' as an involvement of the have-not communities and their realities into urban future, as well as a redistribution of power. When local governments face barriers or limits to their capacities for generating participatory mechanisms, collective intelligences for housing and disaster risk reduction (DRR) may need to be considered strategically, both as a *trigger* and *outcome* of participation.

In other places of the LAC region, governments would value more tools and mechanisms to integrate local knowledge and collective intelligences in urban processes and governance, and with this, placing *life of people* at the centre of any urban intervention. Likewise, not only human actors or institutions play a role in urban governance but also narrative and ideas. For instance, Actor-Network Theory (Callon et al., 1986) conceptualises the notion of 'actant' to point out that non-human actors can play structural roles in urban narratives. In this regard, it seems that there are still-unknown narratives that could be acting against local participation and collective intelligences in the Global South, which would require more (social) research and analysis.

Another important issue for collective intelligences within urban processes could emerge when communities seek to participate in governance, as they need to be *formal* to be considered by the government. Although this can be seen as another form of exclusion, a *justified* way for ignoring alternatives to the *status quo*, some experiences from Chile reflect that strong community organisation and sedimented collective intelligences can create their own power to the point of influencing *governance outside the government*. In Chile, environmentalist and volunteering groups organised to influence a policy change in 2020 on the way urban wetlands were considered by existing laws, and to protect them from exploitation and destruction (Jaque Castillo et al., 2020). Another example is the case of Ollas Comunes – soup kitchens known in Chile as *collective pots* –, an emergent response to the lack of support by the government during the COVID-19 in Chile (Cuffe, 2020). This type of responses involves important logistic and organisational (practical) solutions that include an intensive use of digital tools and material innovations with available (free) resources in each locality: for cooking, packing, transport, and communications (Jiménez & Mora, 2020; LFI 2021). In Chile, Peru, and Uruguay, collective-pots groups help people in need of food and delivering to homeless people and people with disabilities. Most of these groups are characterised by a strong use of social media networks (see Figure 3). In the case of Chile, many of these mutual aid initiatives are extensions of neighbourhood organisations that arose alongside the 2019 Social Outbreak – the explosion of social unrest.

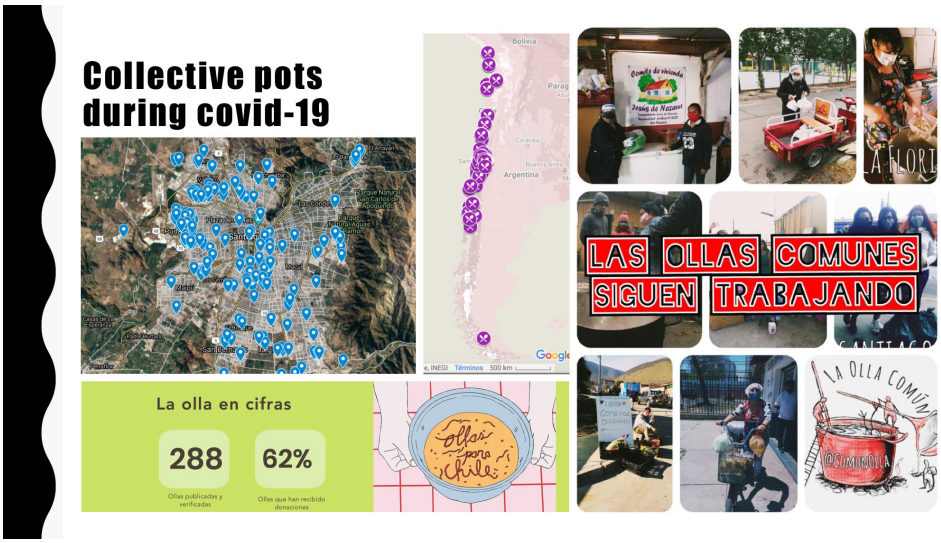

Figura 3. Ollas Comunes in Chile, emergent response to COVID-19
Source: Claudia Gonzalez-Muzzio, 2021.

As collective intelligences of construction and design tend to be neglected by formal, and sometimes *powerful*, governance structures, it seems understandable that such intelligences tend also to be poorly documented: this is something that the INCI project and the Inteligencias Colectivas platform try to reverse. Hence, recognising collective intelligences through documentation and dissemination could help to trigger important discussions around urgent urban and disaster risk problems, issues that otherwise would remain unattended due to the lack of resources or attention, such as it happens with many informal settlements of the Global South.

CONNECTING DOTS: URBAN DEVELOPMENT, DISASTER GOVERNANCE, AND COLLECTIVE INTELLIGENCES

For many of us, there is no doubt about the intrinsic and systemic relatedness between disaster risk and (mal)development (Chmutina & von Meding, 2019; Pelling, 2012), and urban development in particular. Today, nearly 55 percent of global population lives in cities, producing around 80 percent of global GDP (UN-Habitat, 2016). Although urbanisation is a *transformative force* that has helped millions escape poverty through increased productivity, employment opportunities, improved quality of life and large-scale investment in infrastructure and services, urban areas around the world still face enormous challenges and changes. For instance, *persistent* urban issues such as uncontrolled and unplanned urban growth, changes in family patterns, growing number of urban residents living in slums and informal settlements in addition to the challenge of providing urban services for all, have

remained critical. As a result of rapid urbanisation, *spontaneous building* in many large southern cities became a defining feature of the metropolises. However, this spontaneous building has also served as the unofficial, but well-tolerated pacesetter in housing supply and urban development.

Moreover, these and other issues linked to urban development and disaster risks will be exacerbated by the economic and social impacts of the COVID-19 pandemic. In the Latin America and the Caribbean region, about 30 million people could fall into poverty and extreme poverty in the absence of active policies to protect or substitute income flows to vulnerable groups during the pandemic (Cárdenas & Guzmán Ayala, 2020), while 83.4 million people are at risk of hunger in 2020 and 2021 (ECLAC & FAO, 2020).

Under these difficult circumstances and under the pressure of multiple necessities –i.e., housing, food, and other materials–, it is expected that informal settlements, informal employment, and other precarious forms of development will erupt all over the urban areas around the region. For these reasons, good urban governance and collective intelligences in marginalised communities are more important than ever. For instance, tacit knowledge and intelligences around resource-saving building materials and construction methods in areas of rapid (informal) urban growth are urgently needed.

Good urban governance is necessary to better articulate the benefits of urbanisation for all, not only for the (wealthy) few. Local governments of the region need to act rapidly and decisively to protect the common good over speculators and for-profit businesses in cities, which could bring more inequality and exacerbate the already existing tensions. As it was expressed effusively in the New Urban Agenda process, local governments should provide the *enabling environment* for good urban governance, promoting the participation of all social groups in decision making and with more vertical and horizontal relationships between national and regional governments, civil society, academia, and the private sector (UN-Habitat, 2015).

In this respect, collective intelligences of construction and design may result in a beneficial source of opportunities. Emergent responses such as the common pots (*ollas comunes*) in Chile, as well as the large list of cases of construction and design collected by the social platform Inteligencias Colectivas in the LAC region, are good examples of the potential of community organisation and creativity. As we have reviewed, collective intelligences may be seen also as seeds or catalysers of grassroots organisation and therefore showing their potential to challenge dominant urban governance structures. This type of *community* tacit knowledge on housing construction and product design may challenge the governmental and formal, but they are also an inexhaustible source of creativity and solutions to every-day problems, including those related to disaster risks and disaster impacts. Timely and contextualised solutions that maximise the (re)use of local resources could be a good alternative to attend the every-growing demand for housing and new products that solve basic needs while strength resilience to disaster. Nevertheless, we found that the relationship between collective intelligences of construction and design and their contribution to solve the urgent urban needs in a sustainable and secure way still demand further research.

ACKNOWLEDGMENT

This work was supported by the Berlin University Alliance [Grant Code: 831_InauCall_10] within the framework of the Excellence Strategy of the German Federal and State Governments. We thank to all friends, colleagues, and collaborators that worked around the INCI project both in Germany and Cuba.

REFERENCES

Arias-Loyola, M. (2021). Evade neoliberalism's turnstiles! Lessons from the Chilean Estallido Social. *Environment and Planning A: Economy and Space*, *53*(4), 599–606. https://doi.org/10.1177/0308518X21997832

Boder, A. (2006). Collective intelligence: A keystone in knowledge management. *Journal of Knowledge Management*, *10*(1), 81–93. https://doi.org/10.1108/13673270610650120

Bouvier, A. (1987). The Right to Make Mistakes. *For the Learning of Mathematics*, *7*(3), 17–25. https://www.jstor.org/stable/40247902

Büscher, M., Liegl, M., & Thomas, V. (2014). Collective Intelligence in Crises. In D. Miorandi, V. Maltese, M. Rovatsos, A. Nijholt, & J. Stewart (Eds.), *Social Collective Intelligence: Combining the Powers of Humans and Machines to Build a Smarter Society* (pp. 243–265). Springer. https://doi.org/10.1007/978-3-319-08681-1_12

Callon, M., Rip, A., & Law, J. (Eds.). (1986). *Mapping the Dynamics of Science and Technology: Sociology of Science in the Real World*. Palgrave Macmillan. http://doi.org/10.1007/978-1-349-07408-2_

Cárdenas, M., & Guzmán Ayala, J.J. (2020). Planning a Sustainable Post-Pandemic Recovery in Latin America and the Caribbean. *UNDP Latin America and the Caribbean #COVID19 Policy Documents Series, 19*(21), 1–17. https://www.latinamerica.undp.org/content/rblac/en/home/library/crisis_prevention_and_recovery/planeando-una-recuperacion-sostenible-para-la-pospandemia-en-ame.html

Chmutina, K., & von Meding, J. (2019). A Dilemma of Language: "Natural Disasters" in Academic Literature. *International Journal of Disaster Risk Science*, *10*(3), 283–292. https://doi.org/10.1007/s13753-019-00232-2

Coyula, M., & Hamberg, J. (2004). *Understanding Slums: The Case of Havana, Cuba*. David Rockefeller Center for Latin American Studies, Harvard.

Cuffe, S. (2020, November 24). *Grassroots aid and growing needs in Chile*. The New Humanitarian. https://www.thenewhumanitarian.org/news-feature/2020/11/24/chile-grassroots-aid-hunger-covid-new-needs

ECLAC. (2020). Addressing the growing impact of COVID-19 with a view to reactivation with equality: New projections. *Economic Commission for Latin America and the Caribbean (ECLAC), Spacial Report COVID-19*(5), 1–24. https://repositorio.cepal.org/handle/11362/45784

Fischedick, M., Roy, J., Abdel-Aziz, A., Acquaye, A., Allwood, J., Ceron, J. P., Geng, Y., Kheshgi, H., Lanz, A., Perczyk, D., Price, L., Santalla, E., Sheinbaum, C., & Tanaka, K. (2014). Industry. In O. Edenhofer, R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel, & J. C. Minx (Eds.), *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter10.pdf

Fundación Procultura. (2021, February 17). *Nosotros*. https://www.procultura.cl/nosotros/

Fundación Proyecta Memoria. (2021, February 17). *¿Qué hacemos?* Proyecta Memoria. http://proyectamemoria.cl/?page_id=27

Garcés, M. (2020). October 2019: Social Uprising in Neoliberal Chile. *Journal of Latin American Cultural Studies*, *28*(3), 483–491. https://doi.org/10.1080/13569325.2019.1696289

Gonzalez-Muzzio, C., & Sandoval, V. (2016). *"Resilient responses from communities and companies after the 2010 Maule earthquake in Chile". Input paper for the World Conference on Disaster Risk Reduction in 2015 in Japan, report titled The State of DRR at the Local Level – A 2015 Report on the Patterns of Disaster Risk Reduction Actions at Local Level*. UNISDR. http://www.preventionweb.net/go/48289

Hight, C., & Perry, C. (2006). Collective Intelligence in Design. *Architectural Design*, *76*(5), 5–9. https://doi.org/10.1002/ad.314

Inteligencias Colectivas IC. (2021, February 17). *About Inteligencias Colectivas*. https://inteligenciascolectivas.org/es/acerca/

Irazábal, C. (2021). Governance, Institutional Coordination, and Socio-Spatial Justice: Reflections from Latin America and the Caribbean. In O. Carracedo García-Villalba (Ed.), *Resilient Urban Regeneration in Informal Settlements in the Tropics: Upgrading Strategies in Asia and Latin America* (pp. 151–173). Springer. https://doi.org/10.1007/978-981-13-7307-7_8

Jaque Castillo, E., Ojeda-Leal, C., & Almendra, D. (2020). Use pressure of the urban commons at Metropolitan Areas. Case of "Boca Maule" wetland in Chile. *Ateliê Geográfico Journal*. *14*(3), 74–99. https://doi.org/10.5216/ag.v14i3.60518

Jiménez, B.G., & Mora, A.P. (2020). Estallido social y pandemia: De los cabildos a las ollas comunes. El caso del Norte Grande de Chile. *Espacio Abierto*, *29*(4), 106–117. https://www.redalyc.org/jatsRepo/122/12265803006/index.html

Kelman, I., Mercer, J., & Gaillard, J. (2012). Indigenous knowledge and disaster risk reduction. *Geography*, *97*(1), 12–21. https://doi.org/10.1080/00167487.2012.12094332

La Fabrica de Innovación LFI. (2021). *Innovación frente al Coronavirus: Distintas respuestas ante la falta de recursos*. La Fabrica de Innovación. http://lafabricadeinnovacion.com/2020/06/20/alimentacion/

Milanés Batista, C., Planas, J. A., Pelot, R., & Núñez, J. R. (2020). A new methodology incorporating public participation within Cuba's ICZM program. *Ocean & Coastal Management*, *186*, 105101. https://doi.org/10.1016/j.ocecoaman.2020.105101

Pelling, M. (2012). Hazards, Risk and Urbanisation. In B. Wisner, J. C. Gaillard, & I. Kelman (Eds.), *The Routledge Handbook of Hazards and Disaster Risk Reduction*. Routledge. https://doi.org/10.4324/9780203844236.ch13

Quarantelli, E. L. (1994). *Emergent behaviors and groups in the crisis time periods of disasters*. http://udspace.udel.edu/handle/19716/591

Ribbeck, E. (2002). *Informal Modernism: Spontaneous Building in Mexico-City*. AWF Verlag.

Rubio, L. V., Gragera, J. C., & Fernández, M. D. (2018). Collective Intelligences: The Future is Hybrid. *Architectural Design*, *88*(5), 66–71. https://doi.org/10.1002/ad.2344

Sandoval, V., & Sarmiento, J. P. (2020). A Neglected Issue: Informal Settlements, Urban Development, and Disaster Risk Reduction in Latin America and the Caribbean. *Disaster Prevention and Management*, *29*(5), 731–745. https://doi.org/10.1108/DPM-04-2020-0115

Sarmiento, J.P., Sandoval, V., Jerath, M., Hoberman, G., Arrieta, A., Chen, W., Lidth de Jeude, M., Schütte, O., Mazariegos, E., Palacios, E., Cardona, O.D., Bernal, G., Ruiz, P., Rosales, E., & Polak, S. (2018). *Performance Evaluation in LAC Urban DRR Programming: The Neighborhood Approach* (p. 290). United States Agency for International Development (USAID). https://pdf.usaid.gov/pdf_docs/PA00T34V.pdf

Sassen, S. (2014). *Expulsions: Brutality and Complexity in the Global Economy* (Illustrated edition). Harvard University Press.

Sherry Arnstein. (1969). A Ladder of Citizen Participation. *JAIP*, *35*(4), 216–224. https://doi.org/10.1080/01944366908977225

Tierney, K. (2012). Disaster Governance: Social, Political, and Economic Dimensions. *Annual Review of Environment and Resources*, *37*, 341–363. https://doi.org/10.1146/annurev-environ-020911-095618

Twigg, J., & Mosel, I. (2017). Emergent groups and spontaneous volunteers in urban disaster response. *Environment and Urbanization*, *29*(2), 443–458. https://doi.org/10.1177/0956247817721413

UN-Habitat. (2015). *HABITAT III Issue Papers 6 – Urban Governance*. UN-Habitat.

United Nations Economic Commission for Latin America and the Caribbean ECLAC, & Food and Agriculture Organization of the United Nations FAO. (2020). *Cómo evitar que la crisis del COVID-19 se transforme en una crisis alimentaria: Acciones urgentes contra el hambre en América Latina y el Caribe.* United Nations. http://hdl.handle.net/11362/45702

United Nations Human Settlements Programme UN-Habitat. (2016). *World Cities Report 2016: Urbanization and Development—Emerging Futures*. United Nations. http://dx.doi.org/10.18356/d201a997-en

Vivacqua, A. S., & Borges, M. R. S. (2010). Collective intelligence for the design of emergency response. *The 2010 14th International Conference on Computer Supported Cooperative Work in Design*, 623–628. https://doi.org/10.1109/CSCWD.2010.5471897

Weichselgartner, J., & Pigeon, P. (2015). The Role of Knowledge in Disaster Risk Reduction. *International Journal of Disaster Risk Science*, *6*(2), 107–116. https://doi.org/10.1007/s13753-015-0052-7

FURTHER READINGS

Castellanos Abella, E., & Wisner, B. (2019). Natural Hazards Governance in Cuba. In *The Oxford Research Encyclopedia of Natural Hazard Science*. Oxford University Press. https://doi.org/10.1093/acrefore/9780199389407.013.238

Djalante, R., & Lassa, S. (2019). Governing complexities and its implication on the Sendai Framework for Disaster Risk Reduction priority 2 on governance. *Progress in Disaster Science, 2*, 100010. https://doi.org/10.1016/j.pdisas.2019.100010

Pasel, R., Sack, F., Valdivia, L. & Zix, J. (2018). *Bella Vista : Regionale Lösungen für globale Herausforderungen : Ein Deutsch-Bolivianisches Design-Build- Projekt*. Edition Detail.

Wisner, B., Brenes, A., & Marchezini, V. (2020). Non-Governmental Organizations and Natural Hazard Governance in Latin America and the Caribbean. In *The Oxford Research Encyclopedia of Natural Hazard Science.* Oxford University Press. http://doi.org/10.1093/acrefore/9780199389407.013.333