



# Canadian Journal of Development Studies / Revue canadienne d'études du développement

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/rcjd20>

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To cite this article: Gonzalo Lizarralde, Lisa Bornstein, Benjamin Herazo, Roberto Burdiles, Claudio Araneda, Holmes Páez Martínez, Julia Helena Diaz, Gabriel Fauveaud, Andrés Olivera, Gonzalo Gonzalez, Oswaldo López, Adriana López & Tapan Dhar (2022): The problem of doing more: success and paradoxes in scaling up informal initiatives for disaster risk reduction and climate action, *Canadian Journal of Development Studies / Revue canadienne d'études du développement*, DOI: [10.1080/02255189.2021.2019574](https://doi.org/10.1080/02255189.2021.2019574)

To link to this article: <https://doi.org/10.1080/02255189.2021.2019574>



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Published online: 21 Feb 2022.



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## The problem of doing more: success and paradoxes in scaling up informal initiatives for disaster risk reduction and climate action

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### ABSTRACT

Development studies highlight the importance of scaling good practices and their replicability and transferability to face global warming. But what happens when practices originate in informal urban contexts? Should they be replicated, amplified and formalized? We explore the opportunities and contradictions that emerge in scaling disaster risk reduction in informal settings. For four years, we documented 24 local initiatives and the work of leaders in Latin America. Results show that impact depends on intermediaries, trust, dialogue and a delicate balance between conflicting objectives and different levels of involvement by externals. To succeed, initiatives must address “the problem of doing more.”

### RÉSUMÉ

Les études en développement international soulignent souvent l'importance d'augmenter l'impact des bonnes pratiques en réponse aux changements climatiques, ainsi que de considérer leur reproductibilité et leur transférabilité. Mais qu'arrive-t-il lorsque ces pratiques trouvent leurs origines dans des contextes urbains informels? Doivent-elles être reproduites, amplifiées, et formalisées? Nous explorons les opportunités, ainsi que les contradictions qui émergent lorsque l'on essaie d'augmenter l'impact des stratégies de réduction du risque dans des contextes informels. Pendant quatre ans, nous avons documenté 24 initiatives locales et le travail de plusieurs leaders locaux en Amérique Latine. Nos résultats indiquent que leur impact dépend des intermédiaires impliqués, de la confiance existante entre les acteurs, des dialogues entre eux, de l'équilibre

### ARTICLE HISTORY

Received 4 June 2021

Accepted 15 November 2021

### KEYWORDS

Climate change; risk reduction; scaling up; transferability; climate action; informality

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(souvent fragile) entre des objectifs parfois contradictoires et des degrés d'investissement variables de la part des parties prenantes externes. Pour atteindre leur but, ces initiatives doivent résoudre le « problème d'en faire toujours plus ».

## Introduction: the paradox of scaling informality

Climate change action is based on the principle that we need to do more. The climate problem is so enormous that more action is required in terms of adaptation and disaster risk reduction (DRR) in almost every sector globally, and particularly in the Global South. Impact requires scaling good practices so more people, buildings, businesses, and services can be safe. Successful DRR initiatives that fail to be scaled up might become mere anecdotes, and perhaps forgotten, which is a missed opportunity to produce the desired impact.

Pressure to scale up climate response often comes from three different sources. First, international policy, which encourages governments to adopt national climate regulations and plans (Anguelovski et al. 2016). Examples of this include the New urban agenda promoted by United Nations agencies and their partners (Caprotti et al. 2017) and the World Bank programme aimed at improving national codes and regulations to achieve resilience (World Bank 2015). Noticing the impact of such pressures, Ciplet, Roberts, and Khan (2013) conclude that “finance for developing countries to adapt to the adverse impacts of climate change now tops the international climate negotiation agenda” (49). The second source of pressure comes from government and public agencies that find it difficult to cope with the financial burden of destruction and disruption in economic activities. Writing on the financial pressure caused by climate-related events, Kousky (2014) argues that “estimates of the average annual cost of weather-related extreme events since 2000 range between \$94 billion and over \$130 billion” (590). There is consensus that inaction has a cost when it comes to climate change. “Doing nothing will cost more than acting,” concludes the OCDE in a recent report (OCDE 2021). The final source of pressure comes from citizens, charities and the civil society, which demand action to prevent damages and provide security to citizens and businesses (Kelman, Mercer, and Gaillard 2017; Schipper and Pelling 2006; United Nations Office for Disaster Risk Reduction 2019).

But a great deal of climate change action in the Global South happens in informal settings; that is, places such as slums, squatter settlements, shanty towns, *barrios*, *favelas*, *tugurios*, *cités*, *comunas* and other neighbourhoods of informal origin. If bottom-up practices are deeply rooted in conditions of informality, how can they be successfully scaled up? Should they be “formalized” in a way that can be replicated? What are the main challenges and opportunities in scaling up informal bottom-up initiatives? This paper seeks to answer these questions and uses them as a starting point to reflect on implementation challenges in the field of climate response in Latin America and the Caribbean.

We use the term “informal settings” to refer to spaces and circumstances wherein individuals, households, or communities develop mechanisms of response to hostile conditions (marginalization, exclusion, racism, poverty, etc.) to secure access to food, water, sanitation, shelter, income, livelihoods, infrastructure and services. Informality is here both an attribute and a way of doing things within urban contexts (Hansen

2001; Hernández-García 2013; Hussmanns 2004; Lizarralde and Root 2008; Werna 2001). We do not adopt here a normative view of informality. If anything, we see it as a consequence of both environmental and social injustices and acknowledge its strengths and how it overlaps with formal and institutionalized standards and practices (Doherty and Silva 2011; Durand-Lasserve and Selod 2009). Our premise, however, is that urban informality, where unregulated construction, urban development and economic activities abound, and where there is little trust between government and citizens, creates a particular context for scaling DRR action. There are several reasons for this. First, informal activities often exist beyond the margins of government oversight and are sometimes considered illegitimate and unplanned. In informal settings, public initiatives and policy often hide dubious social and political agendas, such as the desire to categorize these spaces as illegal so as not to normalize a situation some consider abnormal. Second, people living and working in informal conditions are often the most affected by climate change, natural hazards and other threats such as crime, pandemics and food insecurity. Third, in informal settings, local leaders (and not public institutions) are recurrent initiators of positive change. This is not fully surprising considering that there are difficulties in implementing state initiatives in areas where public institutions are often perceived as corrupt. Fourth, even though climate action requires adequate policy, change “on the ground” does not always follow the principles declared in regulations, law and policy documents. Finally, several bottom-up DRR solutions not only happen in informal settlements, but they also deploy informal forms of production, management and governance. Very often, they concern activities that are part of the informal economy (such as home-based unregulated food production), employ unregistered workers (such as informal builders) and consume products found in informal markets (recovered construction materials, for example). Quite frequently, they are also conducted without construction permits, and do not necessarily follow regulations—standards for food production and distribution, for instance.

While recognizing the importance of producing positive impact for as many people as possible, this study ultimately adopts a critical view of the objective of maximizing solutions in conditions of informality. It scrutinizes the advantages and difficulties of trying to produce wide impact in DRR. In doing so, we challenge the feasibility of scaling informal solutions, and wonder: if the nature of a local initiative is its informal origin, does it make sense to scale it up?

Our approach was based on active research, where our team not only documented activities in informal settlements, but also became an actor in stimulating positive change. In the first section of this paper, we explore the idea of scaling impact, summarizing the main contributions in this field. Second, we explain the empirical methods adopted to answer the research questions, notably in our action research in Colombia, Chile and Cuba. Third, we describe the main results obtained, focusing on the areas of success and failure in initiatives aimed at scaling impact. Fourth, we analyse these results in the form of three tensions and paradoxes. Finally, we discuss the theoretical and practical implications of the study, highlighting key elements that need to be considered in a climate agenda suited to areas of informality in the Global South. We conclude that impact in DRR requires an ethical framework. This said, what conditions must be included in that framework? We will eventually conclude that an appropriate scaling

approach must consider issues of trust, integrity, equity, governance, attachment to place and social and environmental justice.

### **The problem of maximizing impact**

Scaling up is typically seen as a desirable outcome in agriculture, development, business and other fields (Tall et al. 2014). Increasing impact has become so central to development studies that some authors advocate for the recognition of a “scaling science” (Hayley, van Haeren, and McLean 2020, 2). There is a recognition that scaling is a complex objective that requires a systems approach at several levels of implementation. Impact in food security, for instance, requires multi-scalar action within several elements of the food system (Shaw et al. 2018).

Most authors recognize that there are two common types of impact: horizontal and vertical scaling-up. The former corresponds to “geographical spread to cover more people and communities [...] and involves expansion within the same sector or stakeholder group.” The latter is “institutional in nature and involves other sectors or stakeholder groups” (Menter et al. 2004, 15). Alternative ways of increasing impact include “scaling out,” where the impact can remain at the same level of decision-making but occurs in new communities or social groups (see, for instance: Bunn et al. 2019), and “scaling in,” where an initiative is reinforced without necessarily increasing impact among other stakeholders (for instance, by empowering a group of leaders without increasing the number of them).

Menter et al. consider that scaling up is “a management issue.” For them, “it is about how to manage projects to ensure that positive impact is maximized” (9). The benefits and value of maximizing impact, however, are often a matter of debate. Several advantages, but also challenges, of scaling have been found in the following areas related to climate response: agriculture (Westermann et al. 2018); urban retrofitting (Dixon and Eames 2013); adaptation (Ouma et al. 2018), community-based activities (Schipper et al. 2014), watershed management (Darghouth et al. 2008), education (Amri et al. 2017); and private-sector actions (Hart 2013). One of the most common problems is the time it takes to scale up an initiative. Having enough time to mainstream or scale an initiative is important. A study in Bangladesh, for instance, shows that it can take up to seven years to go through the whole implementation process (Ayers et al. 2014). Another problem concerns how to be sure that the obtained (or desired) impact is positive. Successful scaling, it is often found, requires rigorous monitoring and evaluation (Saito 2013).

Other authors have raised concerns about issues of equity, pertinence and governance in scaling action. According to Westereman et al. (2015), for instance, “scale refers to the benefits brought about through the intervention not only in terms of the number of people and the geographical area but also in terms of time and equity scales” (14). Other studies have argued that scaling is a matter of social responsibility towards results (Gargani and McLean 2017). These authors argue that the principle cannot be to “scale what works,” but to scale impact that serves the public good (McLean, Gargani, and Lomofsky 2020). For these authors, the main objective is not to “maximize” impact, but to guarantee that effects correspond to the needs and expectations of a larger scope of stakeholders (McLean and Gargani 2019). In this approach, scaling impact is “a

coordinated effort to achieve a collection of impacts at optimal scale that occurs if it is both morally justified and warranted by the dynamic evaluation of evidence.” These authors focus on the governance aspects of impact. This means that maximization is not virtuous if the impacts fail to respond to the values and requirements of stakeholders. This approach considers that innovation does not have intrinsic value, and the pertinence of change depends on the qualities stakeholders can perceive (see, for instance: Lizarralde et al. 2014).

We adopt the framework proposed by McLean and Gargani and contend that scaling is not primarily a management issue, but an ethical one. Later on, we will see that, broadly speaking, this ethical approach focuses on issues of equity, appropriate governance, cultural relevance, place attachment and social and environmental justice. Adopting a critical stance of our own work, we also echo arguments by Westoby et al. (2020), who call “for the urgent sharing of failures as a source of critical learning” in climate adaptation.

### **The dangers of replicability and transferability**

In architecture, geography and urban planning, replicability, transferability and other scaling strategies are sometimes seen with scepticism—perhaps more than in other areas such as management, agriculture, telecoms and infrastructure. Architects and urban planners argue that buildings and urban solutions are decisively contextual (Bachelard 2014; Rapoport 2005). Solutions in architecture, for instance, do not have intrinsic value; their pertinence and meaning depend on the alignment between the idea and the cultural, social, historic and geographic context of implementation (Moore 2019; Rapoport 1982). In this phenomenological approach, the term “genius loci” refers to the spirit of a place, which encompasses its history, political characteristics, social context, cultural traditions, landscape features and geographical conditions (Norberg-Schulz 1997, 2019). Solutions in contexts of risk and even post-disaster reconstruction must respect this *genius loci* to (re)create meaning for people and respect local values (Alexander 2004).

The common response to this argument is that it is not technical solutions per se that can or must be scaled up, but the concepts or ideas behind them. In this way, it is not the local builder’s technical solution to the roof that must be generalized, but the idea of building a safe roof. Institutions can adopt the concept of building safer roofs without necessarily adopting a specific construction technique. But this approach raises the question: At what level is replicability required? The “safe roof” approach implies a level of abstraction that may or may not be fully loyal to the objective, spirit and value found by the local builder in her own solution. What aspects of the *genius loci* is lost at higher levels of abstraction or generalization?

The objective of taking ideas to higher levels of abstraction is particularly problematic when it comes to risk and the built environment. Architects, geographers and urban planners have long recognized that there is a danger in taking a local idea to higher levels of abstraction for wider implementation. In *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*, Scott (1998) shows examples in which authorities adopt a concept or idea, institutionalize it and apply it (sometimes indiscriminately) in other contexts. Scott shows how in this process, authorities often seek legibility, abstraction and standardization to exercise power and dominate others

seen as “subalterns.” By implementing abstract ideas, those in power manage to erase local practices, replacing them with those that are seen as more rational, effective or efficient.

Abstraction is also problematic in the field of DRR, where several authors have condemned the transfer of ideas as a form of control (Gallard 2018). They deplore how foreign ideas about risk management are often introduced in vulnerable communities and social groups (Aragón-Duran et al. 2020), often deploying new language and abstract notions (Lizarralde et al. 2020). Abstract concepts such as “resilience,” “panarchy,” and “adaptive capacity”—many of which are even hard to translate to local languages (Chmutina et al. 2020)—are systematically introduced in communities, sometimes obscuring and masking valuable local notions. Abstract ideas about security, safety, “building back better,” or sustainability are also used to implement new standards and planning principles that make little sense in local contexts (Muñoz et al. 2019; Petter et al. 2020).

The problem of abstraction of solutions is also relevant in global warming. Several authors have explored the challenges of mainstreaming ideas (Scoville-Simonds, Jamali, and Hufty 2020). Some have pointed to the problem of maladaptation (Rauken, Mydske, and Winsvold 2015) to refer to cases in which ideas or initiatives are adopted without proper contextualization. Maladaptation often occurs when there is over-confidence in seeing an idea as inherently positive. In most cases, there are assumptions about the benefits and moral worth of an abstract idea, such as sustainability or adaptation (Anguelovski et al. 2016, 2018, 2019)—as if those ideas lead to inherently positive outcomes (Magnan et al. 2016; Moloney, Fünfgeld, and Granberg 2017).

Given this context, we developed a series of activities to explore the advantages and risks associated with scaling DRR bottom-up initiatives that emerge in informal settings. The following section presents a summary of them.

### **Methods: action research in DRR**

This study was designed as an action-research initiative in three countries: Colombia, Cuba and Chile. The study was funded by an international development agency and conducted between 2016 and 2021 by an international research group, in partnership with five local research teams. We worked in four small and medium-size cities: Yumbo and Salgar (Colombia), Carahatas (Cuba) and Concepción (Chile). The total team included 20 researchers from the disciplines of architecture, urban planning, engineering, social work and social geography. It also included two key officers from *Corporación Antioquia Presente*, a Colombian NGO with activities in the region and focused on disaster response. Our work focused on four locations with significant levels of informality, notably in terms of informal land appropriation and unregulated construction and economic activities. We prioritized neighbourhoods and informal settlements at risk of climate effects such as sea-level rise, floods, landslides and droughts, and which were affected by a recent disaster. We conducted qualitative research before and after natural hazards occurred, which allowed us to understand changes sparked by destruction as well as opportunities for and barriers to change.

We are well aware that policy without implementation is an empty shell. Therefore, we decided to engage with local actors on the ground. This means that we were not passive observers of the phenomena under investigation, but active agents in the process.



Engaging in close work with local leaders was key to be able to follow their activities, gain trust and understand, from within, the dynamics of implementation. However, this approach requires that we disclose three potential conflicts of interest that might have influenced our results.

First, although our team did not have any commercial or economic interest in implementation, we wanted to create spaces for teaching and learning for undergraduate and graduate students, as part of our academic work. We wanted to expose students to real DRR action, and therefore aligned research and implementation activities with workshops, seminars, design studios and other pedagogical exercises. This objective was explicitly disclosed to all leaders and partners involved in the study. Second, our work had two components: research and implementation. To be clear, the implementation component aimed at having as much impact as possible, but we had no direct benefit from scaling action. Third, we were closely engaged with local leaders and after months of working together, friendships were established between them and researchers on the ground. We all felt empathy for their struggle and cause. In that sense, we wanted leaders to succeed in their endeavours. But from a scientific point of view, we were as much interested in identifying the factors of success in scaling and implementation as in documenting the barriers, difficulties and challenges they faced. We agree with Westoby et al. (2020) who argue that learning from adaptation failures and mistakes requires encouraging failure reporting, avoiding a shaming culture and resisting an obsession with success. This includes assessing both success and failures in grassroots initiatives aimed at climate adaptation in the Global South (Westoby et al. 2021).

This paper reflects on the relationship between implementation and impact. Given our emotional involvement with the cause of local leaders, we tried to report our experience as objectively as possible. Here we attempt to assume neither a defensive nor a self-promoting tone and to explain the leaders' experiences in terms as faithful as possible to the empirical data we gathered. Although we got involved in scaling activities, we made efforts to adopt a self-evaluation approach and invited an external researcher (and co-author) to help us find and correct potential biases in the results. The paper focuses on our empirical results regarding the work of local leaders, their DRR initiatives and changes in institutions and policy.

### ***Documenting DRR agency***

We interviewed fourteen community leaders and followed their activities for four years, exploring their climate activism and DRR initiatives. Members of local research teams followed their states of mind, examined their struggles, and observed their project management activities. Local teams met with leaders at least five times per year and participated in several activities, including presentations of DRR initiatives, town-hall meetings and community and social gatherings. Researchers also followed their activities on social media, and documented urban planning initiatives and urban changes in the four locations through drawings, photographs and plans.

Local teams interviewed a total of 31 community members and 20 government officers. In each location, we held at least one semi-structured focus group with about ten locals, and one on-site workshop with local and international students in architecture, urban planning and engineering (see [Table 1](#)). During these workshops,



**Table 1.** Empirical activities conducted in the four locations.

	Visits conducted by local team (by int. team)	Interviews with residents (with officers)	Focus groups	DRR initiatives documented	Hours of interviews	Meetings with community leaders
Yumbo, Colombia	7 (3)	6 (3)	4	9	11	10
Salgar, Colombia	3 (1)	10 (2)	1	2	9	2
Carahatas, Cuba	8 (2)	10 (10)	4	4	10	6
Concepción, Chile	4 (0)	5 (5)	4	9	9	6

local and foreign researchers and students held meetings with leaders and citizens, and visited the neighbourhoods and the DRR initiatives (see Table 2). Graduate students were invited to explore design solutions that could support the leaders' initiatives. Researchers and students adopted a reflective approach to understand DRR agency and identify ways of creating more positive impact in each location. Local leaders participated in the presentation of student's projects and commented on their strengths and weaknesses, pointing to possible opportunities and challenges for further implementation.

Our approach to action research was decisively ethnographic, in the sense that we wanted to obtain an "explicit interpretation of the meanings and functions of human actions" (248) (Hammersley and Atkinson 1994). Following Hammersley's (2015) approach, we engaged in both *doing* ethnography and *using* ethnographic tools to understand social dynamics linked to implementation activities. This allowed us to explore risk within its complex socio-political context (Oliver-Smith 1996) and to observe the interaction of local leaders with authorities, students, professors and residents.

### **Documenting DRR activities**

We wanted to understand not only how leaders conduct activism, but also to what extent they effectively impact their neighbourhoods and settlements and how much this impact can be scaled. To do so, we designed a research strategy to support their

**Table 2.** Summary of workshops held with community leaders.

	Yumbo	Salgar	Carahatas	Concepción
Leaders participating	Six local	Three local	Four local leaders + two from Colombia, and one from Chile	Four local
Researchers/professors participating	20 from four countries	18 from four countries	20 from four countries	Four local professors
Students participating	14 local, 16 from other participating countries	Two from other participating countries	12 local, 18 from other participating countries	20 local
Hours of meetings with leaders	16 over six days	6 over three days	24 over six days	20 over several days
Hours of presentation by community leaders	3	3	6	3

local DRR initiatives with funds coming from the international development agency. The idea was to be able to follow implementation activities for a period of three to four years and identify opportunities and challenges in their efforts to produce impact. We focused on initiatives that were not led by municipal authorities or government agencies. But then we followed the interaction between these stakeholders and citizens and community leaders.

One of the first steps was to set up a scientific committee to select the most pertinent DRR initiatives that emerged in informal contexts in the four locations. The committee prioritized initiatives led by women, but also funded initiatives with mixed or male leadership. Each local leader received USD 2600 that could be used for implementation or scaling up the initiative. Terms of reference were given to local academics (to determine, for instance, issues of research ethics). But local leaders had sufficient freedom to use the resources as they wanted. At some point, we realized we would need to investigate two different types of interventions. In type A initiatives, local research teams played a strong supporting role. Professors and students helped leaders and communities in design, planning, building and management activities. These were the interventions that most benefited from action research, but also the ones that were most “contaminated” by the influence of researchers. Type B initiatives attempted to reduce the level of “contamination.” They were fully led and coordinated by local leaders, with very little involvement from academics, who assumed a more passive role to monitor the initiative’s development.

Our research method explored how impact is achieved and what hinders or enhances it in informal settings. The development of each initiative was recorded in videos, reports, transcripts, diaries and a 6-page report. These reports were then analysed by one or two researchers not involved in the initiative, providing an internal process of validation, triangulation and review. [Table 3](#) summarizes the DRR initiatives that were funded in the study, showing the type of hazard that was considered and the type of response envisaged by the agents of change.

### ***Documenting institutional and policy change***

We recognized that scaling would require changes in policy and plans. Local research teams therefore participated in several meetings and presentations with officers of local municipalities, DRR agencies, private donors and other stakeholders. They documented efforts to implement local results in municipal and regional policy documents (such as the *Planes de ordenamiento territorial*) and environmental plans. They followed changes in policy and strategic plans, and documented how authorities perceived local DRR initiatives. Our team examined how strategic documents evolved during the four years of the study, trying to identify factors that would show scaling effects. Researchers were attentive, for instance, to the emergence of new DRR units within municipalities, and new reports or white papers that could be considered the result of better understanding of climate effects and risks. We also paid attention to influences between local teams. In this sense, our impact was produced locally as well as internationally. We reported how ideas from one country influenced stakeholders in other countries.

This paper reports the results of this empirical work after several exercises in data triangulation.

**Table 3.** Summary of DRR activities, including type of risk addressed and response deployed.

Micro-projet number and name	Location	Type	Type of risk							Type of response					
			Flood	Sea-level rise	Landslides	Droughts	Pollution Air/Soil/ Water	Food insecurity	Deforestation	Crime and violence	Urban agriculture	Sports and recreational activities	Art and cultural events	Education and training activities	Infrastructure/ urban
1 Vertical Community Garden	Concepción, Chile	A							•			•			
2 Pottery Workshop	Concepción, Chile	A	•										•		•
3 Natural Mitigation and Irrigation Barrier	Concepción, Chile	B			•										
4 Urban Edge - Sustainable Urban Drainage System	Yumbo, Colombia	A	•		•					•			•		•
5 Water Management System	Yumbo, Colombia	A	•		•								•		•
6 Community Gardens	Yumbo, Colombia	A							•						•
7 Reforesting Yumbo	Yumbo, Colombia	A			•	•									•
8 Resilient Housing	Carahatas, Cuba	A		•											•
9 Community Group <i>Mujeres del Mar</i>	Carahatas, Cuba	A		•									•	•	•
10 Circle of interest <i>Yo me adapto</i>	Carahatas, Cuba	A		•						•			•	•	
11 Botanical Illustration	Concepción, Chile	B								•			•	•	
12 Classrooms Natural Environments	Concepción, Chile	B						•					•	•	
13 Forest Therapy	Concepción, Chile	B								•			•	•	
14 Plaza Nonguen	Concepción, Chile	A/B											•	•	•



## Results: from local initiatives to policy impact

Local DRR initiatives in the four locations emerged as response to a combination of several climate-related risks, such as floods, sea-level rise, landslides, erosion, pollution, heat waves, droughts and deforestation. But they also attempted to deal with risks not commonly related to global warming, such as crime, violence against women, food insecurity and unemployment. They were decidedly rooted in local practices and rituals. In this sense, they were deeply connected with traditions and activities that have social and cultural value within communities. These initiatives required local knowledge in several areas, such as carpentry, construction, management, accounting, agriculture, fishing, water management, waste management and cooking. They also required leaders to have a deep knowledge of the territory, local meanings and culturally rooted customs. We found surprising connections between DRR objectives and other activities that appear unrelated at first glance. In fact, several local initiatives involved culturally relevant activities in public and collective space, including urban agriculture, sports, recreational activities, art, cultural events, education and training.

We notice that the work of local leaders was not so much focused on the final result but on the process, dialogue and political implications of change. Yet the bottom-up initiatives contributed to connect people, meanings and agency in a given space. In all places, leaders sought a local impact, but were also interested in building a larger narrative that reflected intentions of a wider impact. In Carahatas, they saw an opportunity to understand the deep connections between people, housing and the ocean. In Concepción, they manifested a desire to establish a new social contract and better relationships with nature. In Yumbo, leaders were concerned with the cascading effects of multiple threats, ranging from drug-related crime to domestic violence. Finally, in Salgar, they sought to make sense of present and future climate-related risks after a major tragedy.

We identified five forms of transfer that existed in the four locations: 1. scaling-in, 2. horizontal scaling-up, 3. horizontal scaling-out, 4. vertical scaling-up among organizations and 5. vertical scaling-up within planning tools. [Table 4](#) shows how some initiatives were connected to these five forms of impact. Here three examples of local initiatives, their relations to local practices and stakeholders' intentions to scale them up:

Soccer is used by local leaders in Yumbo, Colombia, as a tool in the fight against climate change effects. Local soccer teams are popular among slum dwellers, and sport competitions create opportunities to engage community members and reduce social tension, facilitating in this way collective action. Leaders recognize that sport activities are useful to attract youngsters, deter them from joining criminal activities and engage them in environmental action. They see that building sport and recreational infrastructure also helps to reduce risk, notably if focused on providing solutions to deal with water runoffs, heat waves, floods and landslides. For more than ten years, therefore, local leaders have lobbied for the construction of a soccer field in the slum. They want this project to be not only a place for healthy social encounter, but also an infrastructure that can reduce climate risk in the neighbourhood. With support from our project and donations by local companies, the community recently succeeded in building some basic infrastructure for a soccer pitch, including drainage, retaining walls and stands (a form of scaling in). But locals still need support from the city to finish the project. It is necessary to install grass and frames, provide lighting and guarantee security,

**Table 4.** Summary of impacts produced by bottom-up DRR initiatives.

Initiative (name)	Type of impact				
	Scaling in	Horizontal scaling up	Horizontal scaling out	Vertical scaling up in organizations	Vertical scaling up in planning
1 Vertical Community Garden	■	■	■	■	□
2 Pottery Workshop	■	■	■	■	□
3 Natural Mitigation and Irrigation Barrier	■	□			
4 Sustainable Urban Drainage System	■	■	■	■	■
5 Water Management System	■	■	■		
6 Community Gardens	■	■		■	■
7 Reforesting Yumbo	■	■	■		
8 Resilient Housing	■	■	■	■	■
9 Community Group <i>Mujeres del Mar</i>	■	■		■	■
10 Circle of interest <i>Yo me adapto</i>	■	■		■	■
11 Botanical Illustration	■	■	■	■	□
12 Classrooms Natural Environments	■	■	■	■	□
13 Forest Therapy	■	■	■	■	□
14 Plaza Nonguen	■	□			
15 Estuary Dome	■	■	■	□	□
16 Recovering water	■	□			
17 Family Garden	■	■		■	■
18 Creek Reforesting	■	■		■	■
19 Coastal Festival	■	□	■	■	
20 Ecosystem Adaptation	■	■	■	■	
21 Managing the Risk	■	□		■	
22 Urban Edge (II)	■	■	■	■	■
23 Family Garden (II)	■	■		■	■
24 Creek Reforesting (II)	■	■		■	■

■ Fully completed  
 ■ Partially completed  
 □ Started/potential

among other needs. Leaders would also like to include other partners and potential donors (horizontal scaling up) and replicate the initiative in other areas (scaling out). Finally, they would like the city to adopt a more systematic and rigorous approach to sport infrastructure in low-income settlements. They don't want that sport and recreational projects be anecdotic experiences obtained after long struggles, but the result of institutionalized policy (a form of vertical scaling).

A sea festival led by women acts as an environmental awareness method in Carahatas, Cuba. The coastal village of Carahatas is at risk of flooding due to sea-level rise. In response to this risk, the government has plans to relocate the village to a safer area, a solution that many locals refuse. For many years, this fishing community has organized an annual festival to celebrate the ocean and the lifestyle of living in proximity to it. With support of our project, local leaders have conducted educational activities to create risk awareness among community members and children. They want the festival to be an opportunity to reflect not only on the beauty of nature, but also on the damage humans cause to it. They have developed, therefore, several initiatives that combine risk awareness, environmental education and cultural events. But these activities are still fragile and have limited resources. Local leaders would like to reinforce these activities (scaling in), reach more impact on the region (horizontal scaling up) and influence people and stakeholders beyond their community (scaling out). They eventually want the government to consider alternatives to the village relocation plan and allow them to stay in proximity to the ocean.

In the region of Concepción, Chile, a group of 15 women living in the barrio Bellavista (in the city of Tomé) focused on building vertical gardens for agriculture production. They see urban agriculture as an opportunity to deploy local knowledge while also responding to food insecurity, a problem increasingly exacerbated by global warming effects. Scaling this activity demanded that the municipality provide running water to the new garden. University partners and leaders managed to convince authorities to provide the required infrastructure. They also succeeded in convincing authorities of including this initiative in a larger urban upgrading programme called “Quiero mi barrio” run by government institutions. Based on the prospect of water availability, leaders and community members worked on the construction of a wood structure for gardening activities. But once the project was finished, due to a variety of reasons that remained unclear, authorities eventually backtracked and the water infrastructure project was abandoned. The programme “Quiero mi barrio” ended and thus withdrew from Bellavista. This drawback eroded the trust that locals had in government, but also launched a series of discussions about what to do with the agriculture structures that were already built. Meanwhile, appropriation of the structure by what some locals called “urban tribes” provoked tension among leaders and community members. The structure was eventually dismantled. However, partners considered that there were several social benefits obtained by the project. For many, the process was as important as the result.

These are, of course, three different cases when it comes to urban and housing typologies. Carahatas is a coastal village in a remote location, the project in Tomé was conducted in a low-density peri-urban area, and the slum in Yumbo is densely populated and built near the formal city. Informality has similarities but also some differences. Carahatas is mostly built through self-help artisan construction, whereas informal settings in Yumbo and the Concepción area (that includes Tomé) are built by informal construction companies and labour. Neither Carahatas nor the neighbourhoods in Yumbo and the Concepción area are illegal settlements *per se*. But construction in Yumbo and Concepción without permit and housing reconstruction in Carahatas are all considered illicit or irregular.

These cases emerged also in very different political conditions. Cuba has a socialist government, where the State plays a fundamental role in the provision of housing, subsidies



and services. Colombia and Chile have a capitalist economy, where neoliberal policy has favoured decentralization and transfer of responsibilities for housing and services to the private sector. Competition between political parties is common in Yumbo and Concepción, whereas, inexistent in the Cuban government system. This means that political affiliations in Yumbo and Concepción create a form of social tension that rarely exists in Cuban villages. As an industrial city, Yumbo has a handsome budget and relative autonomy. Tomé is part of the Concepción region, but as a port and tourist city (and its status as independent municipality) it has adequate financial and managerial resources. On the other hand, Carahatas depends on resources that are distributed among different levels of government. In all cases, there are local citizen institutions: *Juntas de acción comunal* in Yumbo, citizen and political *comités* in Carahatas and committees and non-profit organizations in Tomé. But whereas Carahatas is under the jurisdiction of a larger town, in Yumbo and Tomé, informal settlements are under the city administration. Services in Yumbo and Tomé are provided by formal regional companies (public and private ones). In Carahatas they are provided by the State and are largely standardized at the national level. In Carahatas, the local government serves as a vehicle to voice people's concerns to higher instances of government. In Yumbo and Tomé, the political party in office is supposed to represent local interests in political action, but must also negotiate solutions with competing parties. Planning documents in Colombia, for instance, are routinely blocked by the opposition in city councils and political stalemates are common. It is estimated that 75% of city plans in the country are obsolete; in many cases, due to lack of concertation between parties (Instituto de estudios urbanos 2020; Leal Acosta 2019).

Despite all these differences, we found some common traits. In all cases, the local economy is fragile and largely depends on decisions that are made at high levels of government. Citizens find that externals (notably politicians and decision makers) know very little about their territory and the specific conditions in their settlements. Because of this, they believe that they must lobby to influence policy and ought to be active in defending their interests. However, in all cases, their message is often ignored or diluted among several other interests and claims that reach higher levels of government. We shall see that this context eventually leads to two strategies adopted by local stakeholders in all cases: structured dialogue and the search for intermediaries.

### **Scaling in**

*Success:* All local initiatives achieved scaling-in impact. In all cases, they benefitted from: (1) training for community leaders; (2) financial support; (3) access to data and knowledge provided by local universities; (4) facilitation to link local leaders with municipal officers and other stakeholders; (5) increased visibility thanks to the project communication platforms. Local universities played a crucial role in scaling impact. They connected local leaders with authorities, students, NGOs and private donors, and were key in organizing activities aimed at influencing technocrats, NGO representatives and elected officers.

*Challenges and limitations:* Some local leaders changed during the process, and participation by local leaders and community members was different in all locations. In Yumbo, for instance, community members were less engaged in participatory activities,

**Table 5.** Progression of impact during the four years of the study (totals per year).

	Year 1	Year 2	Year 3	Year 4
Cities targeted for implementation activities	3	4	4	4
Neighbourhoods impacted	3	7	8	8
Residents potentially impacted (approx.)	500	700	1000	1100
NGOs participating in implementation activities	1	2	4	4
Stakeholders (institutions) involved	9	13	10	14
Researchers (professors) involved	12	18	22	27

compared to other locations. They also assumed a more passive participation style wherein they expected the university to propose new ideas. In Chile, Salgar and Cuba, community members showed more stable engagement and were more proactive in meetings and workshops.

### **Horizontal scaling up**

*Success:* In collaboration with local universities, local teams were able to mobilize additional leaders. While we started working with only six leaders, four years later, there were more than 30 of them involved in DRR initiatives in the different locations. Local teams also managed to increase the geographic influence of the initiatives. Whereas in the beginning, local leaders and their partners were mostly working at a neighbourhood scale, years later, they had activities that covered a wider geographical zone, incorporating the idea of impacting territories (or watersheds) rather than simply neighbourhoods. Research activities also generated trust among partners in new areas, and therefore it was possible to include the city of Salgar—a location that was not originally identified but became viable for implementation. We eventually funded two local initiatives in Salgar. One of them included training activities that eventually went beyond the city and had impact at a regional scale. See [Tables 5 and 6](#) for details on the impact reached in horizontal scaling-up.

All initiatives leveraged additional resources and funding from local partners. In many cases, the funding we provided corresponded to less than 25% of the resources required to complete the initiatives. Additional resources came from private companies, donations, government support and in-kind contributions by local partners.

*Challenges and limitations:* Early on, it became evident that adding additional leaders and partners could erode the trust of those already engaged. Local leaders were sometimes suspicious of newcomers. In Yumbo, for instance, some local leaders and government officials engaged in environmental protection resented new squatters who built their houses on green areas (this was ironic, as early settlers had also originally squatted on vacant lots and green zones in the city). In considering adding new stakeholders, we noticed that there was a constant danger of alienating or losing the engagement of initial leaders and public and private partners. There was also a risk of alienating consolidated partners by incorporating others that could be associated with different political stances. Finally, university partners in each location also did not want to dilute their influential capacity over too many geographic zones.

Local leaders and partners were also careful to respect geographic boundaries. Local leaders knew, for instance, that other leaders were working in certain locations and that it would be inappropriate to extend their influence to those areas. In

**Table 6.** Type of impact achieved through each DRR local initiative.

Initiative (name)	Leaders involved*	Cities targeted for implementation activities	Neighbourhoods impacted **	Residents potentially impacted	NGOs participating in implementation activities	Stakeholders (institutions) involved	Researchers (professors) involved	Students involved
1 Vertical Community Garden	7	1	1	90	4	4	8	15
2 Pottery Workshop	3	1	1	45	1	4	6	2
3 Natural Mitigation and Irrigation Barrier	0	1	1	0	1	2	4	0
4 Sustainable Urban Drainage System	8	1	1	350	1	3	2	9
5 Water Management System	8	1	1	150	2	3	3	9
6 Community Gardens	9	1	1	450	4	3	2	8
7 Reforesting Yumbo	7	1	1	300	4	3	2	9
8 Resilient Housing	1	1	1	215	2	3	3	2
9 Community Group <i>Mujeres del Mar</i>	6	1	1	130	2	2	3	1
10 Circle of interest <i>Yo me adapto</i>	4	1	1	200	2	2	3	2
11 Botanical Illustration	2	1	1	35	2	2	2	3
12 Classrooms Natural Environments	3	1	1	40	2	2	3	0
13 Forest Therapy	4	1	1	80	1	3	4	20
14 Plaza Nonguen	0	1	1	0	1	1	2	2
15 Estuary Dome	3	1	1	60	1	2	3	2
16 Recovering water	5	1	1	250	3	2	2	0
17 Family Garden	2	1	1	175	2	3	2	3
18 Creek Reforesting	2	1	1	75	3	2	2	3
19 Coastal Festival	3	1	1	0	1	1	3	0
20 Ecosystem Adaptation	8	1	1	160	8	4	2	1
21 Managing the Risk	5	1	1	400	6	4	2	1
22 Urban Edge (II)	8	1	1	350	1	3	2	9
23 Family Garden (II)	2	1	1	175	2	3	2	3
24 Creek Reforesting (II)	2	1	1	75	3	2	2	3
<b>TOTAL *</b>	<b>102</b>	<b>N/A</b>	<b>N/A</b>	<b>3805</b>	<b>59</b>	<b>63</b>	<b>N/A</b>	<b>107</b>

Note: \*These total figures must be taken with prudence, because some leaders, students, residents, and stakeholders participated in more than one initiative. Therefore, they might be counted more than once.

Yumbo, where gang and drug trafficking-related violence is common, there are “invisible barriers” that must not be breached. Gangs and criminal groups control certain territories with violence and coercion. We noticed, therefore, that more impact in all areas or sectors was not necessarily better. It was necessary to concentrate efforts in geographic zones where we could have more control of variables and maintain trust.

Another common problem was related to leadership. Some women leaders in Yumbo were interested in initiating DRR activities and mobilizing actors to begin transformative processes. But they were less interested in politics and, when the initiatives entered the implementation phase, they found it difficult to maintain a leadership role. When the local initiatives attracted the attention of politicians and became publicly known, two women leaders withdrew from the process. As well, when the initiatives required project management skills and detailed budgets and timelines, some women preferred to delegate leadership to other (often male) leaders. This led us to implement workshops to develop managerial skills among local women leaders.

### **Horizontal scaling out**

*Success:* The framework and empirical methodology used for the study proved to be useful and therefore was later applied to a new location not originally covered by our research: the Colombian archipelago of San Andrés. Even though we did not fund local initiatives in San Andrés, the Colombian team’s research work there proved to be useful when, in 2020, Hurricane Iota hit the island causing massive destruction (Redacción Vivir 2020). In Cuba, the framework was later applied to 18 additional municipalities, creating partnerships and collaboration with a Swiss-funded project focused on low-cost housing. This led to the implementation of at least four additional initiatives in other Cuban municipalities, funded by the Swiss cooperation project. See Table 7 for details on the impact reached in horizontal scaling out.

*Challenges and limitations:* One of the main challenges in reproducing the original results in other locations was logistical capacity. In the case of Cuba, the partnership with the Swiss-funded project was key, as it acted as an intermediary to facilitate administrative processes and logistics. But the implementation of DRR activities was more difficult in municipalities that were not part of the Swiss project or lacked a similar intermediary. Another common challenge was the time required to establish trust. Our study lasted four years, and we found that creating solid relationships with partners often took at least two years. When team members later wanted to scale ideas to new locations, they realized there was not enough time to establish the appropriate conditions for successful implementation.

Corruption was another barrier in Colombia. We had trusted partners with whom we had worked in the past. But when we wanted to incorporate new areas of influence, we

**Table 7.** Progression of impact during the four years of the study (totals per year).

	Year 1	Year 2	Year 3	Year 4
Areas where the framework was applied in Colombia	2	2	3	3
Areas where the framework was applied in Cuba	1	4	6	18
Areas where the framework was applied in Chile	3	1	1	1

noticed that there were corrupt politicians and bureaucrats at higher levels of government. We decided to be careful with the expansion of our initiatives to guarantee that the study would not become muddled in unethical practices.

Finally, for many researchers, local leaders and partners, there was always a danger of seeing the research project as a market product that needed large-scale “commercialization.” Many participants were reluctant to see the study as a “product” to which they were supposed to apply market logic for its expansion. Many saw the work of the team, instead, as a piece of craftsmanship that required attention to detail, slow action and finesse, and therefore should not include the aim of substantial expansion.

### **Vertical scaling up in organizations**

*Success:* In the beginning, our influence was mostly at the level of municipalities and local planning offices. But, as the local initiatives gained visibility and legitimacy, they produced influence at higher levels of government: from local to regional and even national institutions. Researchers from all locations started to be involved in committees and decision-making bodies at higher levels of the administration. They became active in climate action and DRR units, and in activities, committees and initiatives led by environmental and planning agencies.

In Colombia, team members were invited to conduct training activities among officers at the *Comité Interinstitucional de Educación Ambiental* (CIDEA), a government unit that brings together local, regional and national institutions to promote environmental education and awareness (including the Regional Risk Unit in the Salgar region). In Salgar, team members and partners had influence in the *Corporación Autónoma Regional* (a unit in charge of environmental matters at the regional level), and the local CIDEA. In Cuba, team members participated in committees and several meetings organized by CITMA, the Ministry of the Environment, Technology and Science. See [Table 8](#) for details on the impact reached in vertical scaling up.

*Challenges and limitations:* One of the main challenges of vertical scaling in Colombia was corruption. Local academics and partners feared that technocrats and politicians at

**Table 8.** Progression of impact during the four years of the study (totals per year).

	Year 1	Year 2	Year 3	Year 4
Institutions impacted in Yumbo, Colombia	Municipality	Municipality	Municipality; CIDEA	Municipality; CIDEA; CAR
Institutions impacted in Salgar, Colombia	Municipality	Municipality	Municipality; Regional Risk Unit	Municipality; Regional Risk Unit; CORANTIOQUIA
Institutions impacted in Cuba	Municipality	Municipality	Municipality; CITMA	Municipality; CITMA
Institutions impacted in Chile	Municipality; National Programme <i>Quiero mi Barrio</i>	Municipality; National Programme <i>Quiero mi Barrio</i>	Municipality; National Programme <i>Quiero mi Barrio</i>	Municipality; National Programme <i>Quiero mi Barrio</i> ; Housing and Urban Development Service (SERVIU)
Leaders trained		10 (Colombia)	12 (Cuba)	8 (Chile)

higher levels of government would ask for bribes and attempt to manipulate the project for partisan purposes. In some cases, including Salgar, politicians did not see a political value in the local initiatives, and ignored them, often postponing meetings with local leaders. They seemed to have short-term interests that did not correspond to the length of the initiatives.

Academics also knew it was important that partners and universities not be associated with government. The political independence of the university, its ideological “neutrality,” as well as the scientific independence of the study (not linked to economic interest) were all key to guaranteeing trust among local leaders and communities. In Chile and Colombia social unrest and strikes in 2018, 2019 and 2021 disrupted several project activities and made scaling difficult. Several officers in government and municipalities were busy dealing with the social movement, and it was difficult to involve them in DRR initiatives on the ground.

Finally, there was the issue of bureaucracy. Small- and medium-sized cities often have small structures and simplified procedures (Lizarralde 2008; Páez et al. 2019; UN-Habitat 2006). In places like Carahatas, Yumbo and Salgar, residents might know politicians and bureaucrats by their first names, and they might even know them personally. In large cities such as Havana, Bogotá and Santiago, municipalities and planning offices have complex structures and additional procedures and protocols. Politicians and officers at higher levels are less accessible and work through several bureaucratic intermediaries. Transferring practices and methods from small and medium-size cities to larger ones proved difficult. The same approaches—based on personal trust, direct communication, constant information sharing and alignment with local values—did not work well when trying to influence larger administrations.

### **Vertical scaling-up within planning**

We realized that some bottom-up initiatives created a form of influence that is sometimes overlooked in scaling literature. This concerns a form of vertical scaling-up not necessarily linked to the bureaucratic or administrative ladder, but to the type of planning documents. In this sense, local initiatives influenced not only higher spheres of government but more strategic planning tools, reaching increased geographic influence and larger timeframes and decision-making power.

*Success:* In some cases, the team managed to transfer ideas from a tactical level to a more strategic one. In Yumbo, Carahatas, Salgar and Concepción, principles of climate response in informal settings were adopted in strategic plans such as the *planes de ordenamiento territorial*, *planes ambientales* and *planes de gestión de riesgo*. The notion of local response to climate threats started to appear in policy reports and became a main subject in conferences and events sponsored by public institutions. In some cases, risk policy was better articulated with environmental policy (Corporación Antioquia Presente 2019; Ministerio de Ciencia Tecnología y Medio Ambiente – CITMA 2020). In Salgar, for instance, local initiatives contributed to pass regulations that banned single-use plastic products and to integrate environmental studies within risk-management activities. Besides, local initiatives influenced the PROCEDAS (*Proyectos ciudadanos de educación ambiental*, or Citizen-led projects for environmental education), which began to include issues of climate change.

**Table 9.** Results of scaling up DRR initiatives in planning documents.

	Year 1	Year 2	Year 3	Year 4
Planning documents influenced in Yumbo, Colombia	NA	Municipal plan	Risk plan	Environmental plan
Planning documents influenced in Salgar, Colombia	NA	Environmental plan	Municipal plan	Risk management Plan
Planning documents influenced in Carahatas, Cuba	Municipal plan	Environmental plan	Risk plan	Educational plan
Planning documents influenced in Concepción, Chile	NA	NA	Risk plan	Municipal plan

When we started the study, the Colombian NGO *Corporación Antioquia Presente* had 30 years of experience in disaster risk reduction, mostly based on reconstruction activities. Two years later, the organization adopted a new strategic plan where risk reduction, climate response and responses to climate effects in informal contexts were considered core activities. There was an explicit strategic move from reconstruction activities to more preventive climate action.

A similar trend occurred with university partners. Work on climate change action went from a local objective in research units and departments to a more strategic objective within departments and faculties. The study consolidated universities' position in the field of climate action, suggesting to stakeholders that climate responses needed to include scientific knowledge, academic actors and rigorous methods. There has been an increased recognition that climate response requires specific knowledge and responses that go beyond technocrats' intuitions and pre-conceived ideas about informality (Aragón-Duran et al. 2020; Lizarralde et al. 2021, 2020; Muñoz et al. 2019; Páez et al. 2019). See Table 9 for details on the impact reached in planning documents.

*Challenges and limitations:* Before starting the study, we assumed it was necessary to include best practices in urban, environmental and disaster risk-reduction policy documents. We assumed, for instance, that it was necessary to include gender sensitivity in some climate policy documents, or to include participation best practices in planning tools. It is true that some policy documents in the region can still be improved, but during the study we found that several policy documents in each location already included some of these best practices. There is policy and legislation in all locations to guarantee public participation (Stone 2018; Valladares 2013), urban agriculture (Leitgeb, Schneider, and Vogl 2016; Moreno Lorenzo, Rodríguez Rico, and San Marful Orbis 2015; Posada, Muñoz-Duque, and Jaramillo 2019) women's empowerment and involvement (Otagri, Morales, and Ayala 2008), environmental protection (Ministerio de Ciencia Tecnología y Medio Ambiente – CITMA 2016), urban resilience (Información comercial 2016) and other noble objectives. Planning documents already include risk reduction measures, and there are guidelines to include climate action in almost all areas of intervention—a good example is the comprehensive climate policy in Cuba (Ministerio de Ciencia Tecnología y Medio Ambiente – CITMA 2020). The main problem we found was not that policy documents were incomplete but that the good principles written in them were rarely implemented. Environmental policy is strong in Colombia (Navas 2010), but it is largely ignored in Yumbo and other places. Regulations and policy that protect women's rights are also rarely enforced or applied in Colombia and Chile (García 2015). Principles that seek food security and sovereignty in Cuba



have hardly materialized in a more resilient food systems (Alvarez 2004; Leitgeb, Schneider, and Vogl 2016). In Chile, frustration with the way policy and regulations are often bypassed (Budds 2004; Musset 2010; Sanchez Bustos 2019) has fuelled a social movement to transform the constitution; but whether the new constitution will lead to stricter enforcement and implementation remains to be seen.

Impact on policy had its share of difficulties too. For some participants, the study required local attention and there were fears that by elevating the level of abstraction and generalization, we could erode trust and disconnect the message from the level of influence locals wanted to achieve. Our success was based on the principle that climate change was not an abstract notion of atmospheric changes, but something with a tangible effect on peoples' daily lives. However, strategic documents often required more generalized ideas about, for instance, adaptation and resilience. There was always the risk that the message about specific social and economic realities on the ground would get diluted in more general statements about urban resilience, climate adaptation and sustainability.

Another problem concerned exposing local leaders to unnecessary visibility. In Colombia, there has been significant violence against social leaders during the past few years (Llanes and Vélez n.d.; Roza López et al. 2021). We therefore worried that by scaling solutions, we could expose leaders to violence. In other places, there was also the risk of misrepresenting leaders as anti-government activists. It was important that leaders received recognition for their actions and took advantage of platforms that provided visibility, so they could spread their message. But leaders were not necessarily public figures (they did not sign up for careers in politics or public service), and they of course wanted to preserve their private lives. Scaling activities always involved the risk of exposing them to stigmatization and unnecessary attacks by political forces.

## Discussion: the paradoxes of scaling

These results show that scaling activities require a delicate balance between increasing impact and maintaining the success factors that allowed local implementation in informal settings in the first place. In this sense, there were three common tensions that stakeholders confronted all the way along.

*Tension 1: Collaborating with authorities vs. denouncing politicians' hidden agendas.* Leaders in the locations we investigated had long known their governments had tolerated (or even enacted) social and environmental injustices that put them at risk of climate change effects. They based their activism on denouncing authorities' tolerance of poverty, insecurity, deforestation, pollution, lack of services and infrastructure, and other social and environmental ills. They had grown accustomed to unfulfilled promises by politicians and economic elites. Scaling their actions, however, often required some form of collaboration with authorities, which put them in an awkward situation: How could they collaborate with the stakeholders they had consistently denounced as corrupt, inefficient and negligent?

Similarly, local academics built their research platforms on issues of social and environmental injustice. In many cases, they denounced governments' inaction on poverty, and lamented neoliberal practices that contribute to risk creation in informal settlements. These researchers have also found drawbacks in authorities' approaches to urban and development problems. Neither academics nor local leaders wanted to be

associated with the stakeholders responsible for the policies they decry. They know that larger impact requires action by the administration, but fear their activism may be hijacked by politicians seeking political gains. Another problem is that the message of social and environmental injustice might be diluted or even masked in political rhetoric (for example, in empty discourse about urban sustainability or resilience).

*Tension 2. Collaborating with other stakeholders vs. maintaining a neutral political stance:* In Colombia and Chile, the legitimacy of academics and NGOs such as Corporación Antioquia Presente largely relies on their political independence. Although fighting injustice is inherently political, researchers and NGO officers are careful not to display partisan allegiances or to name a specific political party in their allegations. In places where polarization often leads to political deadlock and nasty power games, neutrality regarding political parties is key to building bridges, connecting stakeholders and finding new solutions. Collaboration with government in contexts of political fervour, however, erodes the image of neutrality and political independence that academics and NGOs often need.

*Tension 3. Getting involved in more complex systems vs. maintaining the original mission:* Local leaders in the informal settings we explored have built their activism in specific areas that are deeply connected with local conditions. These include reforestation in endangered areas, water management in response to residents' needs, and maintenance of urban space and its use for recreational or sports activities. Local NGOs also have specific sectors of action, such as food insecurity, water management, or anti-poverty measures. Similarly, research groups and academic teams build their reputation on specific expertise, such as urban design, green infrastructure, or working with children for urban change.

Scaling action in response to climate effects, however, requires a systemic approach to risk. It demands considering several simultaneous threats and responses in various fronts and sectors (construction, mobility, urban design, reforestation, waste, etc.). Cascading effects and the influence between several urban systems must be considered. This implies that stakeholders interested in scaling climate response might need to venture into new areas and sectors, and find connections with additional systems. All of this requires additional expertise and activities that might go beyond the original mission of organizations and leaders. We found that this type of impact puzzled several stakeholders in the cases we studied. Organizations interested in reforestation, for instance, were less inclined to work on housing construction; professors working on urban design were less interested in dealing with employment; and so on. All recognized that these were crucial areas of intervention, but they often found that too much involvement in them would distract them from their core mission and push the boundaries of their expertise too far.

These three tensions characterized the spaces for expanding impact, particularly in Chile and Colombia. In Cuba, spaces were created or constrained mostly by logistical capacity. There was potential to influence new locations and policy, but the effort required to solve logistical problems sometimes surpassed the benefits of additional expansion. In all cases, it was clear that a broker of implementation activities was often required.

### **Key success factors**

We found that there are five key ethical factors in scaling activities:

- (1) **Trust:** Reliability is crucial to ensure that stakeholders are willing to commit effort and resources to DRR initiatives. As in the case of the Chilean vertical gardens, this trust is fragile and breaking it has secondary effects.
- (2) **Transparency:** We found that it was crucial to be transparent with local leaders about efforts to include new stakeholders, create new alliances and open up collaboration with authorities. In one particular case in Colombia, a local leader decided to withdraw from the process when additional stakeholders were invited to collaborate. In this case, transparency ensured she did not feel betrayed.
- (3) **Timing:** It is important to take time to create new partnerships, build trust and create communication and logistical channels to assure implementation. There is, of course, the temptation to act faster to seize new opportunities. But we found the risk of eroding local leaders' trust and alienating local representatives was too great.
- (4) **Legitimacy:** NGOs and academic partners are seen as legitimate actors in climate activism largely because of their political neutrality when it comes to partisan agendas. Maintaining this legitimacy throughout is crucial for them to act as intermediaries between communities and government.
- (5) **The connection between ideas and context:** It became evident that the pertinence of some climate responses depended on their fit with historical, geographic and social conditions. We also found that some stakeholders were careful in not attributing value to a “good idea,” when it was not properly rooted in a specific response to local conditions. This led us to constantly question the value of ideas and principles of implementation, even when they seem “appropriate” or “logical” at first glance. Here we conclude that place attachment is key, notably because value is intrinsically attached to the pertinence of an idea in its geographic and social context (Cuervo Calle 2008).

We also found there was widespread over-confidence in the capacity of climate policy to produce impact. Good principles are often already included in regulations, law and policy briefs; but this does not mean that those principles are implemented or that regulations are enforced. Scaling action in the region cannot be supported by over-confident policy. Change on the ground requires much more than well-written regulations, reports and briefs. It requires careful, engaged, sustained, and—one might even say—“artisanal” implementation.

*Scaling intermediaries:* Scaling DRR action is a political stake. Some of those political stakes are attached to the very nature of the spaces and communities we engaged with. In the context of informality, where the state is largely absent, governance structures are fragile, and there is little trust between government and citizens, local leaders and community organizations are key actors in change. Local universities also played a crucial role in this particular context. They were trusted by both local leaders and authorities, who saw them as neutral partners without political affiliation. This gave them freedom to act as mediators of action. Universities also had visibility among technocrats and some politicians. When senior professors

invited politicians and government officers to meetings and project activities, they usually showed up.

Local university professors and researchers were also able to “translate” local leaders’ terms and notions for government officials—and vice versa. In this sense, dialogue proved key. The Chilean team call this method “structured dialogue” (*conversación disciplinada*), an approach that was aimed at developing trust and consolidating alliances, by means of opening and sustaining a space for expressing ideas, emotions and intentions in order to co-create meaning between heterogeneous stakeholders. For them, sustained and faithful engagement with residents and local leaders (at the most “human” level) was crucial and could never be replaced by bureaucratic approaches to implementation.

### **Conclusions: an ethical approach to scaling DRR impact**

This study proposed an action research approach to reflect on the opportunities and threats of scaling climate response in the Global South. By focusing on informal settlements, the study revealed the specific conditions in which responses to threats and climate activism are built bottom-up, and often at the margins of—or in parallel with—formal plans. The study suggests that scaling impact in informal settings requires a delicate balance between several, and sometimes conflicting, objectives. Naïve responses to “do more” can produce negative secondary effects and backfire during implementation. This does not mean that stakeholders must choose between “doing more” or “doing well.” Both are required. But it does mean that it is generally not possible to increase impact without unintended consequences, and one must always pay attention to ethical considerations, particularly issues of social justice (fair distribution of benefits and resources), environmental justice (fair opportunities to occupy the territory, and benefit from land), equity (fair treatment of all), legitimacy (recognition by others as a key actor) and governance (fair and transparent structures and mechanisms for decision-making).

The results show that climate response in informal conditions can benefit from intermediaries capable of connecting local leaders and community members with authorities, private firms and NGOs. However, this work requires a careful consideration of ethical conditions. Corruption, lack of trust and lack of legitimacy are common threats to the objective of scaling local activities to produce wider impact. Tensions must be reconciled, and transparency is crucial to achieve consensus. All of this shows that doing more without a clear ethical framework and deep engagement in implementation can be problematic in DRR and climate action. This framework must constantly reflect on the pertinence of ideas within local conditions and the respect for local struggles within their own historical and social context. This is the problem of doing more.

### **Acknowledgements**

We acknowledge the special contribution of our partners: the Universidad del Valle, the Pontificia Universidad Javeriana, the Universidad Marta Abreu de las Villas, the Universidad del Bío-Bío, McGill University, and the Corporación Antioquia Presente. Special thanks to the communities of Yumbo, Salgar, Carahatas, and Concepción.

## Funding

This project was funded by Canada's IDRC and reports on initiatives that were partially funded by this institution, Grant # 108501. Project: Climate change adaptation in informal settings: Understanding and reinforcing bottom-up initiatives in Latin America and the Caribbean. It also received support from the Social Sciences and Humanities Research Council of Canada (SSHRC) and the Fonds de recherche du Québec (FRQSC).

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