

Responses to Risk and Climate Change in Informal Settings in Latin America and the Caribbean

The Importance of Bottom-up Initiatives and Structured Dialogue

The final technical report of IDRC's action-research project 108501





Eight Key Messages and Recommendations

Reconsidering explanations and narratives to risk, disasters, and to the impacts of climate change

1. Multiplicity of threats: From an atmospheric problem to daily struggles and social and environmental injustices

Governments, agencies, and climate experts should make policy and devise programs and projects built on diverse perspectives and ways of understanding risk. They should incorporate perspectives of risk and daily challenges expressed by community members and explore less common solutions that will more effectively target the needs and desires of those exposed to natural hazards. The climate agenda must not be dissociated from a social and political agenda aimed at redressing social and environmental injustices.

2. Who knows best? The importance of doing away with abstract buzzwords and grounding initiatives in local ideas and practices as well as emotional responses to risk and climate action

Policy- and decision-makers, experts, and researchers targeting disaster risk reduction in informal settings must sometimes avoid abstract buzzwords (resilience, sustainability, adaptation, adaptive capacities, etc.) and embrace exploratory framings that better engage and mobilize the depth of local residents' knowledge, their emotional responses to risk, as well as climate and environmental injustices.

Building foundations for positive change in informal settings

3. Good policy is not enough: The challenge of infrastructure deficiencies and regulatory contradictions

Writing good policy is not enough. In order to reduce risks related to climate change in informal settings in the region, it is crucial for government at various levels (local, regional and national) to address implementation problems in services and infrastructure. Governments must also revise policy and regulations to identify contradictions and eliminate red tape and other barriers to positive transformation in informal settings.

4. Soccer, dancing, and gardening are climate actions too: The importance of anchoring climate change action in common local practices and making novel connections

A disaster risk reduction and climate agenda built to produce positive transformation in informal settings in Latin America and the Caribbean must allow creative projects to emerge rather than pre-determine what might seem like an obvious solution. In areas that are often riddled with violence, poverty, exclusion, and marginalization, the support of socially and culturally relevant spaces, networks, activities, and events is key to addressing climate risk.

Climate change action is political

5. The importance of trust: Overcoming barriers and establishing common ground between citizens, government, and academia

State institutions and policy makers hold a core responsibility in creating safe decision-making spaces where engaged, transparent, and respectful dialogue with residents in informal settings is possible. Local universities can act as intermediaries and facilitators to create common ground and establish trust between government, citizens, and other heterogeneous stakeholders.

6. The gender paradox: Dealing with gender-based inequality and the importance of leadership by women

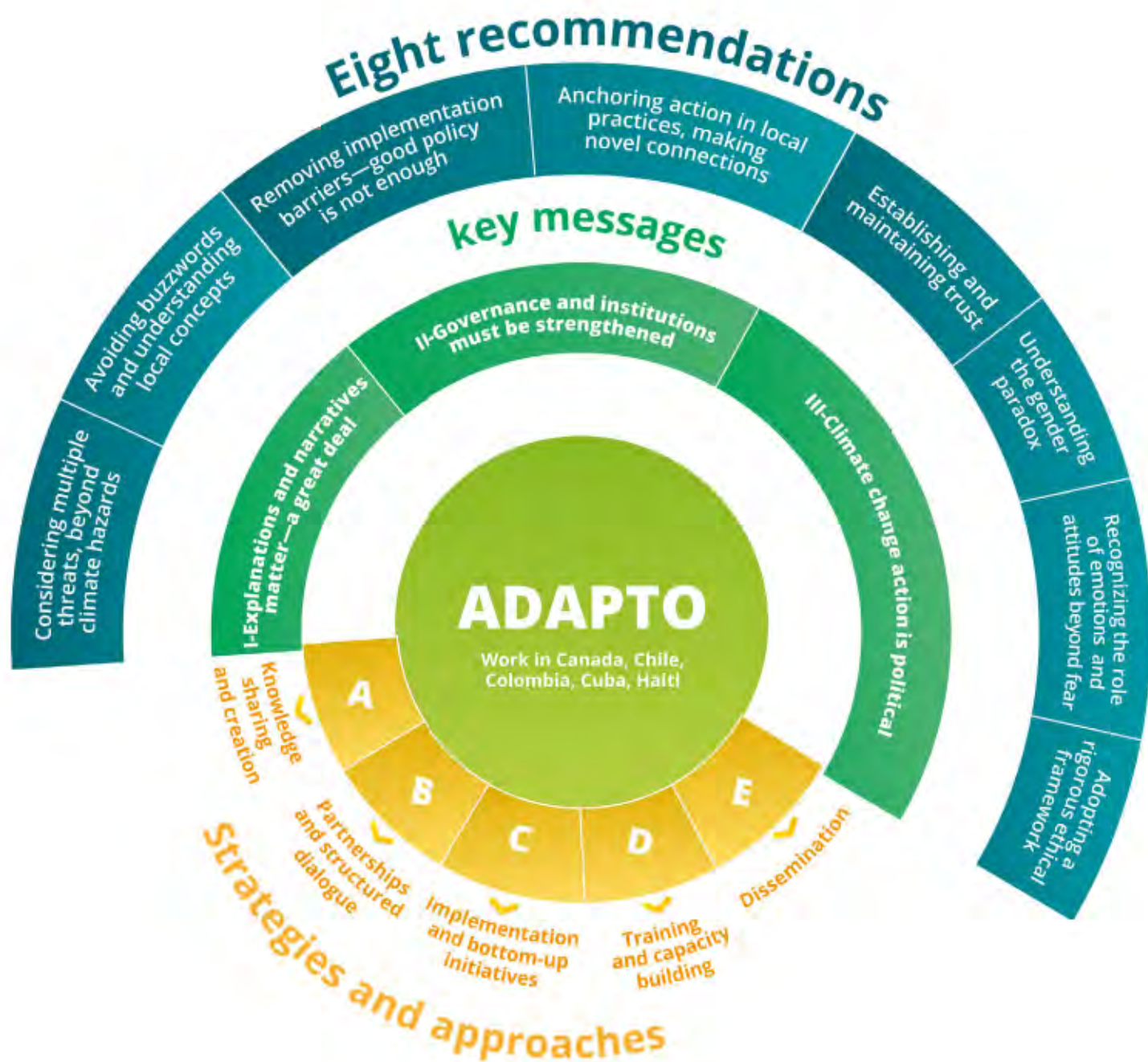
Dealing with climate change and social inequalities should not be two different things. Climate action requires support for community leaders, especially women, many of whom can benefit from safety nets, psychosocial support, training, organizational assistance, and social protection. The climate agenda must not be dissociated from initiatives aimed at increasing women's safety and living conditions and from other programs aimed at removing patriarchal structures that perpetuate gender inequalities in Latin America and the Caribbean.

7. Beyond fear: The role of emotions and attitudes in disaster risk reduction and climate action

Emotions of pride, awe, anger, and attachment to place play key roles in motivating others to act, establishing trust, and generating conditions for change. Officers in government, international agencies, and NGOs can benefit from understanding the role of emotions in disaster risk reduction and climate action. Policy and programs should not be based exclusively on the notion that people are, or should be, afraid of certain hazards. They should be designed to recognize that other emotions play a major part in people's reactions to risk and motivate responses such as attachment to place, reluctance to relocate, acceptance of danger, and emphasis on redressing social and environmental injustices.

8. Forward, sideways, and upward: The importance of an ethical framework

Government, agency, and NGO officers must frame scaling impact within ethical principles that respect issues of legitimacy, trust, attention to detail and local characteristics, as well as residents' and local leaders' notions of transferability and replicability. Scaling informal practices requires challenging traditional notions used in formal interventions in order to make a greater impact.



Model of the strategies deployed, the results obtained, and key messages resulting from the work conducted by ADAPTO



"Being an agent of change in Carahatas with the ADAPTO project is an excellent opportunity to share and learn about how to adapt to the effects of climate change."

Community leader in Carahatas, Cuba



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Œuvre Durable (OD), the Disaster Resilience and Sustainable Reconstruction Research Alliance, is a multi-university research team created by a partnership between the Faculty of the Built Environment at Université de Montréal, the School of Urban Planning at McGill University, and the Department of Geography, Planning and Environment at Concordia University.

The team is dedicated to the study of vulnerability, resilience, and sustainable reconstruction. It analyzes living environments through theoretical and empirical approaches to vulnerability and resilience in the context of major disruptions, such as natural disasters, climate change, socio-political conflicts, and threats to economic stability.



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1. Executive summary

By virtue of its impact, budget, and number of participants, ADAPTO is one of the most ambitious recent research and implementation initiatives in the area of disaster risk reduction (DRR) and climate response in informal urban settings in Latin America and the Caribbean.

The project (also known as “Climate Change Adaptation in Informal Settings: Understanding and Reinforcing Bottom-Up Initiatives in Latin America and the Caribbean”) was conducted from 2017 to 2021 by a multidisciplinary group of researchers from five universities and one NGO. It was funded by the International Development Research Centre of Canada and coordinated by the Canadian Disaster Resilience and Sustainable Reconstruction Research Alliance (L’Observatoire universitaire de la vulnérabilité, de la résilience et de la reconstruction durable, or *Œuvre Durable*, in French). The researchers explored responses to climate change and variability in informal settings in Colombia, Chile, Haiti, and Cuba (see example in Fig. 1). The project was organized into five components:

Knowledge sharing and creation that encompasses five detailed longitudinal case studies, and includes the identification of patterns between them, in addition to support and funding for student research, exchanges, and internships;

A partnership plan that brought together more than 50 academic and non-academic partners through international workshops, public presentations, and other activities aimed at facilitating networking;

Local Initiatives that focused on action research with local leaders and set the stage for a series of further local actions targeting disaster-risk reduction linked to climate change;

Training activities that were held with local leader to develop capacity within communities to face climate risks, identify priorities, and instigate creative work; and,

A dissemination plan that concentrated on sharing the knowledge created and the learning generated throughout the project by way of public presentations, media events, conferences, and academic publications.

Over the course of the four-year project, the team (see Fig. 2) supported and followed, through structured dialogue, ethnography, narrative analysis, and design workshops, the actions of 17 local leaders, most of whom were women, and

¹A definition of “informal settings” is provided in the following section





Fig. 1. The Panorama neighbourhood in Yumbo, Colombia

22 bottom-up disaster-risk reduction initiatives in informal settings. This work was unique owing to its emphasis on urban informality, the relationships between urban transformation and socio-political dynamics, and gender conditions in relation to risk. It focused on integrating, scaling, expanding, and disseminating local knowledge and practices, notably those embraced by women leaders. The originality of the methods used, combined with the fact that this work was based on engaged dialogue, sustained engagement with local leaders, and creative work, was instrumental in establishing trust between public entities and communities in informal settings, in breaking down knowledge barriers, and in creating common understandings so stakeholders could join forces in disaster-risk reduction.

By listening to the often ignored voices of vulnerable citizens living in conditions of informality, the researchers were able to challenge common epistemologies of risk and disasters. They questioned conceptualizations and strategies for dealing with climate change risks that are common in the Global North and frequently applied in the Global South. The ADAPTO researchers demonstrated that to reduce climate risk in the Global South, it is necessary to understand the social and cultural dynamics and the vulnerabilities that exist in conditions of informality. One key conclusion is that to be successful, the climate agenda cannot be dissociated from a political one aimed at redressing environmental and social injustices and dealing with slum dwellers' most pressing needs.

Our message in a nutshell

Dealing with climate change requires much more than technical solutions. Climate change action in Latin America and the Caribbean must be based on sustained dialogue and cannot be dissociated from a political agenda aimed at redressing social and environmental injustices.

The project created favorable conditions for women and local leaders in informal settings to work in disaster-risk reduction and climate action. More specifically, it achieved the following goals for sustainable change:

Knowledge sharing and creation

- Increased awareness among **1250 community members and local authorities** about the risks associated with water, particularly those exacerbated by climate change such as droughts, floods, sea level rise, and lack of potable water.
- Increased awareness among **90 officers and representatives** of local authorities about the significant role women play in risk reduction and climate response in informal settings.
- **New knowledge** about explanations of risk, disasters, and climate change in informal settings in the region.
- **Innovative knowledge** about the role of legitimacy, trust, and partnerships in governance, as well as the relevance of considering people's emotions in climate change action and bottom-up activism.
- **Original methods** based on structured dialogue, ethnography, narrative analysis and design workshops to establish trust and develop empathy among stakeholders interested in disaster-risk reduction in informal settings.
- Better understanding of the factors that influence governance and stakeholders' legitimacy in climate action in informal settings.

Implementation and bottom-up initiatives

- Strengthening of collaboration agreements and partnerships between **5 academic institutions, 4 non-governmental organizations (NGOs), and 7 municipalities.**
- **Support provided to 33 female community leaders and close partnerships** formed with them.
- **Technical, administrative, and financial support to 22 bottom-up initiatives** of disaster risk reduction in informal settings.
- **Impact** through bottom-up initiatives among more than **3,000 residents** in informal settings.
- **Additional resources and contributions** obtained for a total of **CAN\$ 848,354.**



Fig. 2. ADAPTO core research team in Santa Clara, Cuba in 2019.

Training, capacity building and education

Training of more than **300 undergraduate students** on issues related to climate adaptation in informal settings and more than **110 graduate students** on research methods and tools to improve current understanding of climate disaster and risk.

Incorporation of **climate response into the curriculum** of **12 architecture** and urban planning **studios** and **15 university courses**.

Creating multidisciplinary academic teams capable of supporting cutting-edge research in the selected countries.

Support provided to **150** leading students who are likely to become leaders of change, through **engaged mentoring**, **49 student scholarships**, and **102 travel scholarships**.

Dissemination and Influence

A **unique online platform** that contains **22 reports of implementation initiatives** and an **essay** that reflects on the results obtained.

13 scientific articles in top-tier journals, **1 op-ed article**, and **2 book chapters**.

Results presented in **2 new books**.

18 academic presentations, **15 presentations to non-academic partners**, **11 press articles**, **4 radio interviews**, and participation in several **podcasts**.

11 policy briefs, **3 construction guidelines**, and **20 videos**.

Strengthening networks in disaster-risk reduction through social media, events, and meetings with local communities, as well as one virtual international seminar that brought together approximately **50** participants.

Influence in **15 policy and strategic documents** on disaster-risk reduction, environmental action, and climate change response in **4 countries**.

Adjustments were required during the project. The project's epistemological approach evolved to respond to dynamic realities on the ground. We recognized the importance of revising the language and theoretical frameworks that were first proposed. Grounded in empirical results, we shifted our emphasis from adaptation to disaster-risk reduction and the importance of redressing social and environmental injustices. Research methods evolved, focusing on narrative analysis to inform design activities. Researchers in certain countries added research questions in response to issues related to violence in Haiti and Colombia and the social movement that emerged in Haiti, Chile, Colombia, and other countries in the region.

The project required adjustments in implementation and management. For instance, project managers modified their approach in Haiti and Cuba in order to address administrative constraints, opportunities, and potential risks. In Cuba, working with the Swiss Cooperation-funded project Habitat II helped to overcome administrative barriers. Because of the COVID-19 pandemic, we made changes to meetings and workshop, relocated interns, and supported new initiatives such as Voces de Carahatas. All modifications to the original plan were made in consultation with, and reported to, our IDRC PO, who provided unwavering support during the entire process.

An international network of fellows and leaders remains active and continues to share information, research, practices, and events. New funding opportunities have emerged, not only for academics, but also for local leaders and communities. ADAPTO created the foundation for new academic programs, better policy making, and on-the-ground transformation in informal settings. Through the combination of multidisciplinary research, effective strategic alliances, locally led initiatives, sustained training, and knowledge dissemination, the ADAPTO research team played a leading role in the creation of new knowledge in Latin America and the Caribbean. The project outcomes and stakeholders have become key in climate research and disaster-risk reduction policy and action in the region.

2. The Research Problem

“Canaan emerges not as an administrative unit, but as a space of dreams, attachment, and aspirations, and as a place of divergent representations and meanings shaped by marginalization, elitism, corruption, and catastrophes.”

Anne-Marie Petter et al., (2020). Open access [here](#).

The links between the climate crisis and informality

Coupled with rapid urbanization, climate change is exacerbating the effects of weather- and water-related hazards in many cities around the world. Among other effects, climate change increases the intensity (and sometimes the frequency) of cyclones and tropical storms, floods, droughts, and land-slides, while also causing increased erosion, loss of flora and fauna, and rising sea-levels.

As the need to adapt to climate change now seems inevitable, a significant challenge looms. Changes in water cycles and water-related risks are particularly devastating for the urban poor, especially those living in so-called informal settings, where survival largely depends on now fragile environments, local water sources (sometimes “illegally” obtained), local food production, non-industrialized agriculture and manufacturing, and home-based income-generation activities [1]. This set of climate changes is in addition to pre-existing vulnerability factors affecting much of the population living in informal urban settings, such as limited access to credit and services, weak political influence, and greater insecurity with regard to food, water, and home and land tenure [2-5].

* While recognizing the importance of ongoing conceptual debates about the “informal,” the notion of “informal settings” (or “*condiciones de informalidad*”) adopted in this project refers to the time, places, and circumstances wherein people (at the individual, household, or community scale) develop intertwined mechanisms of response to local conditions and/or sets of adaptive measures to secure access to water, sanitation, shelter, income, livelihoods and services, and to improve their general wellbeing in the face of hostile conditions.

In this sense, “informality” is an attribute, and a way of doing things within a given system that encompasses a wide range of economic activities, governance structures and built environment production processes [6-10]. The notion typically refers to bottom-up activities that are developed outside or in parallel with institutionalized procedures and standards while often overlapping or co-existing with formal





and institutionalized plans and programs, thus blurring the “formal/informal” divide [11, 12]. The term “informal settings” has, of course, subjective and fuzzy boundaries, overlapping with ideas of the “vernacular,” “indigenous” or “crafts(wo)manship.” It is also highly context-specific: informal housing conditions and economic activities in Cuba, for instance, differ from those in Colombia, Chile, and Haiti.

We also recognize that the risk that the term “informal settings” might convey misconceptions about illicitness, or illegality. However, we emphasize here the fact that the term does not refer to a legal status but to housing and economic conditions that emerge from local agency in parallel with government action or in the absence of it.

In informal settings, people live in poor housing conditions, governance is typically fragile, and there is insufficient trust between stakeholders [13, 14]. Governance fragility is often linked to absence of the State, but it can also be caused by authoritarian power, partisan conflicts, political polarization, corruption, and political deadlocks [15-17]. Very often, government institutions oscillate between exercising little or too much influence over living conditions in informal settings, adopting positions that range from “laissez-faire” (ignoring local action) to imposing authoritarian measures such as evictions, relocation, and radical physical transformation [18]. Finally, in many cases, urban upgrading programs funded by the State and aimed at increasing resilience or sustainability are used to evict low-income residents and gentrify key urban areas [19-21].

People living in low-income settlements are often victims of exclusion, racism, and marginalization [22]. Many have suffered displacement and the majority generally resent the fact that the government is largely absent or too oppressive, and that it fails to provide adequate services and infrastructure [23, 24]. Residents often fill in these gaps by building their own homes and creating their own infrastructure and providing informal solutions to basic services [25-27]. But too little is known to date about how these bottom-up and informal solutions are planned, designed, managed, and executed [28, 29].

Previous studies [13, 30-32] and our early results showed that there are several disconnects in the work aimed at disaster-risk reduction in Latin America and the Caribbean. These disconnects are notably between:

Government and citizens. There is lack of trust, as well as insufficient information sharing, a lack of connection or communication, across different languages and narratives;

Theory and practice. In particular, there are different perceptions and explanations of risk and climate change between academics, politicians, and citizens;

Policy and implementation. In some cases, there is good policy but insufficient implementation and regulations are rarely enforced; and,

Intentions and reality. For instance, it is difficult to do away with patriarchal structures, racism, corruption, and elitism, and to transform governance mechanisms, and rooted practices and institutions.

Therefore, the negative effects of climate change are—and will most likely continue to be—felt most strongly by historically marginalized populations living in those places that are variously known as slums, favelas, barrios, bidonvilles, bustees or shantytowns and/or those depending on informal means of production and informal economic activities [33, 34].





The double paradox of disaster-risk reduction

In Latin America and the Caribbean, climate change adaptation is characterized by a double paradox. First, while informal settings in the region are typically highly vulnerable to water-related risks associated with climate change, they are also effective incubators of bottom-up, informally driven mechanisms of adaptation. Second, these strategies are very often initiated and led by women, who constitute a particularly vulnerable group but also play a crucial role in building the social fabric that make such adaptation possible.

Extensive research exists on the causes of vulnerabilities [31, 35, 36] and the conditions for resilience enhancement [37-39]. That said, empirical research, as well as on-the-ground implementation and validation, are needed to understand and support the specific role of informal strategies in disaster-risk reduction (DRR). In response to this challenge, this project is centred on women-led adaptation strategies initiated within informal settings in response to the fragile relationships between human settlements and water.

ADAPTO focused on women-led adaptation strategies initiated within informal settings in response to the fragile relationships between human settlements and water. It explored how, in small and mid-sized Latin America and Caribbean cities, local leaders in informal settings implement adaptation strategies to reduce vulnerabilities and enhance resilience, and how these strategies could be: (a) scaled up to increase their impact; (b) transferred between contexts to enhance innovation and learning; and (c) integrated into policy to guarantee sustained change. In addition, the project examined how best to foster relevant new strategies through improved conditions in governance. We focused on adaptive strategies in:

- Water preservation, including environmental protection, water accessibility and security, and changes in the relationships between water and its related ecosystems;

- Water use for consumption, sanitary systems, and waste management, among others;

- Development of infrastructure (such as drains, reservoirs, water treatment and safe water collection systems) to guarantee access to clean/potable water;

- Protection of people and the built environment from water-related hazards (such as floods, draughts, cyclones, tsunamis, and sea-level rise), with mechanisms (informal regulations and conventions) and physical interventions, such as levies, water barriers, canals, and vernacular housing typologies; and,

- Income-generation activities to ensure food security while maintaining stable relationships with water accessibility and consumption.

Disasters do not affect us all in the same way

Women are particularly vulnerable to climate-related risks [40]. They are less likely than men to have influence on policy or to be formal decision makers themselves [41]. They are also less likely to own property and have access to welfare, credit or formal employment [42]. Additional family responsibilities (caring for children and the elderly) limit women's flexibility to move and find better jobs as well as housing in other places. Women and their businesses often lack access to credit [43] (or only have access to loans at prohibitive interest rates), which make them less likely to rebound after a crisis [44]. In many places, they have higher unemployment rates (which make it more difficult for them to recover) and are more frequent victims of male-infllicted violence and aggressions [45], which undermine their psychological health and well-being [40]. Moreover, little attention is paid to women's and girls' needs, after disasters occur. Insufficient efforts are often made to protect them against sexual and domestic violence, including femicide [46].

Nonetheless, low-income women are especially active in home-based income-generation activities, production and informal businesses and they often play key roles as community leaders and as agents of change in the face of global warming.



The expressions “agent of change” or “leader” in this context refer to individuals (with an emphasis on women) who display various forms of guidance (e.g., charismatic, communicational, and organizational) within their own social groups, such as families, communities, cities, and organizations.

Many of the bottom-up strategies that emerge in informal settings are initiated or led by women, who play a crucial role in building the social networks and fabric that make disaster-risk reduction possible [47, 48]. In fact, women are central to climate and environmental action in informal settlements because of their significant roles in planning and executing informal and semi-formal strategies related to water management (such as access, collection, and treatment), sanitation, urban agriculture, environmental protection, caregiving, credit, business development, and street security [49-51].

Project objectives

ADAPTO is the result of many years of work with local communities, organizations and non-academic partners in Latin America and the Caribbean.

The objectives, conceptual framework, and methodology were defined with them and were tested and validated in smaller projects conducted between 2010 and 2016. In accordance with IDRC's strategic plan, this project:

- Invested in knowledge and in innovation for large-scale positive change;
- Identified, empowered, and prepared the leaders for today and tomorrow; and,
- Consolidated effective partnerships for great impact in Latin America and the Caribbean.

The general objective was to create the conditions for scaling up and transferring informally driven strategies of adaptation to climate change, in particular those strategies or initiatives led by women, in small and medium-sized cities in Latin America and the Caribbean, and for integrating bottom-up disaster-risk reduction initiatives into policy.

The main research question was: What actions are (and can be) implemented by agents of change in informal settings in small and mid-sized Latin America and Caribbean cities in the face of climate change and variability?

Specific questions

In terms of knowledge creation:

- How is adaptation achieved through different mechanisms, strategies, and plans (bottom-up and top-down), and what role do women play in these processes?
- How do informal strategies respond to changes in the relationships between society, human settlements, and water?
- How are adaptive measures related to issues of identity and to cultural and historic relationships with water?

In terms of implementation:

- What are the main challenges and opportunities for integrating successful practices into formal governance instruments and plans, and for scaling up the implementation of these practices?

In terms of dissemination:

- Which of these practices have the potential to be transferred to other geographic settings? Under what conditions, and how, is this possible?

3. Approach, Methods, and Strategies

“It is tempting to translate “resistir” (to resist) as a capacity. But in conversations with locals, we noticed that the term was referring not so much to a capacity, but to an attitude. In local narratives, women who resist a traumatic event, certainly have capacities to deal with destruction; but they also have a certain attitude to confront the event; this includes positivity, faith in a better future, and a determination to get over the event and “move to something else.”

Aragón-Duran et al., (2020). Open access [here](#)

The model in Fig. 4 shows the interaction between stakeholders as articulated in the ADAPTO project.

Our work was organized into five areas of influence: (A) a Knowledge Plan aimed at developing innovative empirical research; (B) a Partnership Plan aimed at bringing together heterogeneous stakeholders; (C) an Implementation Plan focused on action research and implementation; (D) a Training Plan aimed at developing local capacity to face climate risks; and (E) a Dissemination Plan focused on knowledge and expertise sharing among stakeholders. Below we synthesize the main activities we conducted in each plan.

A. Knowledge Sharing and Creation

- A1. Detailed case studies
- A2. Scholarships for student research projects
- A3. Internships with partner organizations
- A4. International design workshops

B. Partnership and Structured Dialogue

- B1. Project kick-off meeting and methodology workshop in Salgar in 2017
- B2. The 1st Adaptation to Climate Change - Agents of Change Meeting in Yumbo in 2018
- B3. The 2nd Adaptation to Climate Change Meeting (online in 2020)

C. Implementation and Bottom-up Initiatives

- C1. Implementation workshops
- C2. Monitoring workshops
- C3. Micro-Projects grants
- C4. Implementation videos
- C5. Partner's evaluation meeting in Santa Clara in 2019

D. Training and Capacity Building

- D1. Training workshops for local agents of change

E. Dissemination and Influence

- E1. General communications
- E2. Project website and dissemination in social media
- E3. Policy briefs
- E4. Participation in international academic conferences





Fig. 3. Students engaging in dialogue with residents in Carahatas, Cuba.

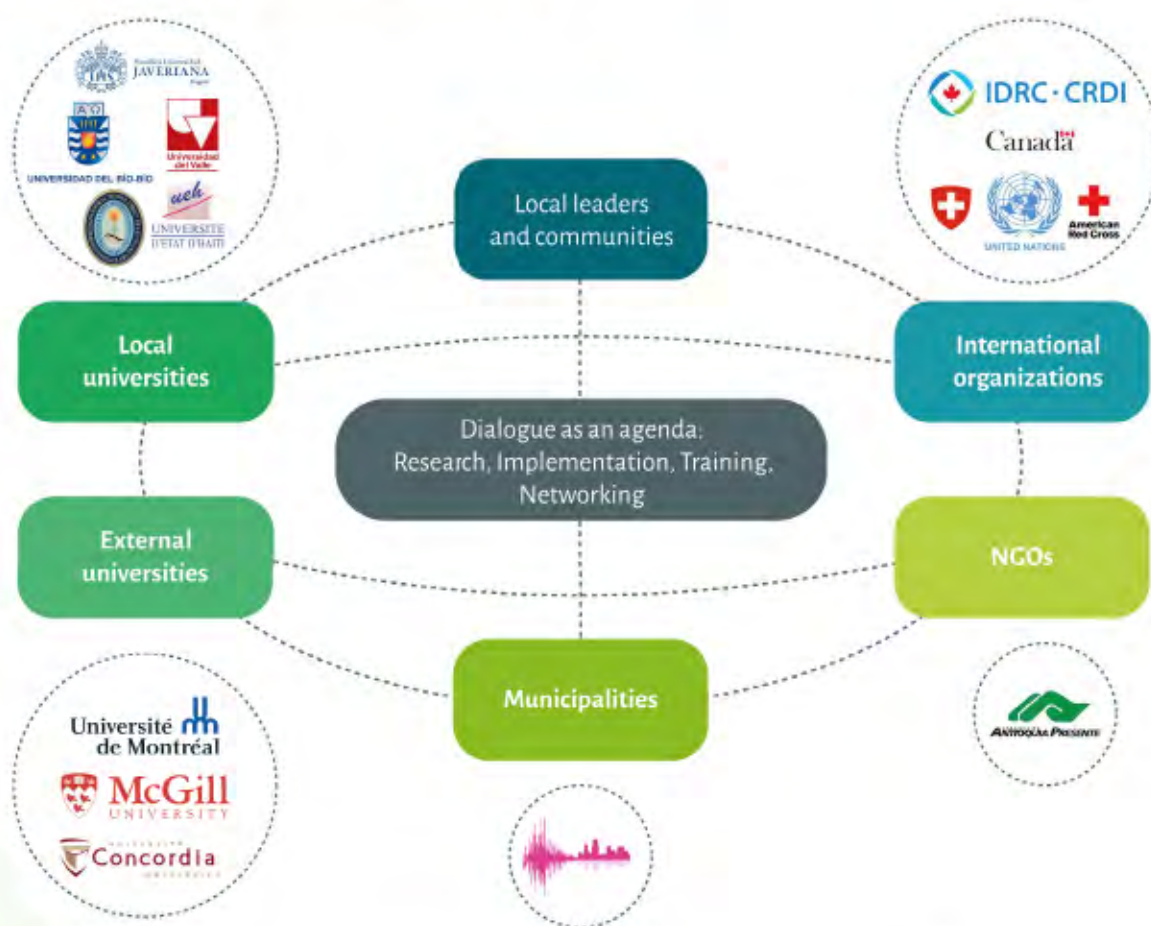


Fig. 4. Model of the interaction between stakeholders in the ADAPTO project

In all these activities, we engaged with local actors on the ground. Rather than being passive observers of the phenomena under investigation, we became active agents in the process. This type of engagement with citizens and local leaders was necessary to follow their actions, gain trust, and understand from within the local dynamics in informal settings. This also meant that local leaders and citizens were not our "objects" of study but rather agents and protagonists of change. ADAPTO deployed seven main methodological strategies.

Table 1 shows the relationship between sub-objectives and each project plan. Table 2 below shows how each of these strategies contributed to each plan. In the following sections we describe and analyze each strategy.

Table 1. Relationships between sub-objectives and main activities and tools in each project plan



Table 2. Methods and strategies

Strategies	A. Knowledge Sharing and Creation	B. Partnerships and Structured Dialogue	C. Implementation and Bottom-up Initiatives	D. Training and Capacity Building	E. Dissemination and Influence
1. Structured dialogue	•	•	•	•	•
2. Longitudinal case studies	•				•
Ethnographic work	•		•		
Policy analysis	•				
Multi-scalar analyzes and perspectives	•		•		
3. International and collaborative design workshops	•	•	•	•	•
Charettes	•		•		
Studios	•		•		
Field courses	•		•		•
4. Narrative analysis	•				
5. Training			•	•	•



Fig. 5. Project members and leaders engaged in structured dialogue in Santa Clara, Cuba.

1. Structured dialogue: Recognizing emotions and building trust

Early on, we found that one of the most significant barriers to change in informal settings is a lack of trust between stakeholders. Residents in informal settlements often distrust politicians and government representatives; they tend to see them as corrupt and inefficient. Elected officials and technocrats often stigmatize slum dwellers and tend to see them as uneducated, illegal occupants of land, as opportunists, and as people who are quick to violate law and regulations. Residents in one neighbourhood might also disregard those in a near-by area, creating rivalry and social tension. Established residents in informal settlements tend to see newcomers as invaders and profiteers (even when, paradoxically, they also occupied land in an “irregular” fashion in the first place). Foreigners, refugees, and migrants are seen with skepticism, and wealthier citizens and residents of posh neighbourhoods are often perceived as arrogant and insensitive. Rural migrants who recently settled in informal settlements often believe that urban citizens are individualistic, impolite, and stiff. In many cases, local academics are viewed as theorists disconnected from the realities on the ground and foreign scholars are linked to forms of scientific colonialism. Scholars also tend to distrust politicians and technocrats, whom they often consider to be inefficient and unethical.

Different language also makes communication difficult. Scholars use scientific terms and abstract concepts that are not always easily understood by residents. Government officials and politicians often adopt an “official” (abstract and unengaged) narrative that does not resonate among those experiencing hardships on a daily basis. The language used by common citizens in low-income settlements is often seen as rudimentary and unpolished by more educated professionals.

Naturally, social cohesion often exists within kinship, social groups, communities of practice, and neighbourhoods.

However, communication challenges, stigmatization of other groups, lack of mutual trust, and fear of the unknown often create social tension and make it difficult for government and citizens to work together.

Our methods had to respond to this context and dialogue proved to be key (see Figs. 4, 5 and 6). It eventually became an overarching method in all our activities. The Chilean team now calls this method “structured dialogue” (*conversación disciplinada*), an approach that seeks to establish trust and consolidate alliances. Structured dialogue is not only about exchanging information and communicating ideas; it is about creating spaces for expressing emotions, helping to heal trauma, trying to understand psychological distress, and co-creating meaning between heterogeneous stakeholders. In this method, sustained and honest engagement with residents and local leaders (at the most “human” level) is crucial. It is also a space to “translate” terms and notions between stakeholders and to deconstruct ideas, claims, and expectations and reconstruct them again after considering what is important for others.

Structured dialogue is more than a means of communication. It is a place of encounter, where stakeholders actively listen to the struggles of others, and empathy is developed. In this method, emotions are recognized, understood, and seen as key components of change. Such dialogue recognizes the researchers’ intention to be part of the emotional process of people who experienced trauma and live at risk or face the effects of climate change. This method recognizes that emotions are key engines of change. Emotions are also culturally specific and therefore must not be detached from local values, rituals, and social representations.

In this process, we recognize that research subjects unavoidably transfer emotions to investigators and vice-versa. Feelings can “cue the researcher into what they think is occurring between them and their objects of study” (p. 172). Feelings in this context are not only inevitable but also useful to understand claims and ideas expressed by others. Quite often, emotions influence the conversation and transform other people’s feelings by, for

instance, transforming ordinary ideas into a shared vision of change.

Structured dialogue assumes an observational and reflective attitude. It builds on the idea of “contagion” as used by Bailliot et al. to describe how the narratives of those who have suffered fear, trauma or violence might “provoke emotional responses, not only in the narrator but also in those to whom the account is relayed” [52]. This method is not so much an activity in itself, but an attitude for conducting the activities described below.

Structured dialogue was also adopted in the work between scholars and between organisations and junior researchers. In this sense, ADAPTO’s international student internships and professor exchanges constituted a key element of our South-South knowledge transfer plan and our structured conversation approach. These internships and exchanges became an original way of co-creating knowledge and comparing patterns found in each location. Internships were spaces for knowledge pollination and for mentoring of junior students by senior staff. The method also builds on Schön’s concepts of knowledge in action, reflection in action, and reflection on action [53, 54]. Local teams organized mentoring exercises in which interns practised communication and design, and worked on building their capacities for analysis and synthesis. For interns, these processes made it easier to acquire professional knowledge and skills through learning by doing.

By the end of the project, 10 graduate students were trained and worked in a foreign location, exchanging data and information between groups. There were also visits by four professors to other research teams.

2. Longitudinal case studies: Understanding socio-political dynamics in conditions of informality

For four years, we conducted longitudinal case studies in Salgar, Yumbo, Concepción, Canaan, and Carahatas. We adopted a reflective approach to understand DRR agency and climate activism and to identify ways of producing positive impact in each informal setting. Our objective was to explore climate-related risks within a complex socio-political context of informality [55]. We aimed to obtain an in-depth understanding of the interaction between local leaders, citizens, urban space, housing conditions, and governance conditions.

Ethnographic work: Our empirical approach was ethnographic. To accomplish this, local teams spent significant time in place in direct contact with residents, understanding their daily activities and social interactions. Following Hammersley’s [56] approach, we engaged in both doing ethnography and using ethnographic tools to examine local dynamics in DRR and climate action. We wanted to obtain an “explicit interpretation of the meanings and functions of human actions” (p. 248) [57].

We interviewed 14 local leaders and, over a period of four years, followed their activities and activism within their communities. We followed their states of mind, daily struggles,

and project management decisions and met with them at least five times per year. Additionally, we participated in several events, including public presentations, town-hall meetings, and community gatherings. We also interviewed a total of 31 community members and 20 government representatives (notably at the municipal level).

Following the work by Roper, we saw interviews not simply as “a narrative, but rather, a relationship in which there are two subjectivities in play” [58]. Early on, we realized that local leaders conducted part of their activism on social media platforms and electronic media proved to be very important during the COVID-19 lockdowns. In response, we followed their activities on Facebook, LinkedIn, Instagram, and WhatsApp.

We also documented their influence on urban landscapes through drawings, photographs, and architectural sketches and plans. Finally, local leaders participated in international design workshops as well as in the presentation of students’ projects (see next sub-heading) and discussions following preliminary research results. They commented on the projects’ strengths and weaknesses, pointing to possible opportunities and challenges for further implementation.



Fig. 6. Jaime Osma, local leader, participating in structured dialogue in 2019.



Policy analysis: In each location, we also analyzed changes in policy and plans. To achieve this, we attended several meetings and presentations with officers of local municipalities, DRR agencies, private donors, and other stakeholders. We also analyzed efforts to implement changes in municipal and regional policy documents related to urban planning, risk, and environmental protection such as the *Planes de ordenamiento territorial*, *Planes de gestion de riesgos*, *Planes de atención de desastres*, and *Planes de gestión ambiental*. We documented how authorities perceived both climate action and local initiatives and documented how strategic documents evolved over the past four years, identifying scaling effects in each location. We documented, for instance, the emergence of new DRR units within municipalities and regional governments and the publication of reports or white papers that could be considered the result of bottom-up activities.

Multi-scalar analyses and perspectives: We adopted a mixed-methods approach to incorporate “both quantitative and qualitative analyses” and multi-scalar perspectives [59]. Information obtained from interviews and testimonies was completed with other primary sources, such as reports by project interns, Masters and PhD theses, videos of student experiences, videos of agent of change experiences, mapping

techniques, GIS data, commented visits to each location, and focus groups with about 10 local residents. In addition, we held one on-site design workshop in most locations (see next sub-heading and Tables 2 and 3).

Preliminary patterns were then triangulated with secondary sources, including policy documents, stakeholders’ websites, international seminar proceedings, press releases, reports, documents and project plans, and policy documents and regulations. These empirical patterns were then compared to those found in literature and similar previous studies. We applied the four levels of triangulation as identified by Love, Peter, Gary Holt [60]: (a) data triangulation, or the comparison of sources of information; (b) interdisciplinary triangulation, where we compared perspectives coming from architecture, construction, geography, engineering, sociology, project management, and urban planning; (c) methodological triangulation, where multiple methods of data collection and analysis were used; and (d) investigator triangulation, by having different researchers (locally and in Canada) independently analyze data on the same phenomenon and later compare their findings to validate results.

Table 3. Empirical activities conducted in the four locations

	Visits conducted by local team (by int. team)	Interviews with residents (interviews 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	3
Carahatas, Cuba	8 (2)	10 (10)	4	4	10	6
Concepción, Chile	4 (0)	5 (5)	4	9	9	6
Canaan, Haiti	3 (3)	15 (6)	5	2	40	17

Finally, we identified patterns within each case study and looked for patterns between them. We reported differences in perceptions, processes, procedures, and actions in each case study and how ideas from one country influenced stakeholders in other countries.

Using the methods described above, we were able to understand how leaders engage in activism. But we also wanted to analyze to what extent the leaders effectively impact their neighbourhoods and settlements and how much this impact can be amplified and replicated. We therefore designed a research strategy to support leaders' bottom-up initiatives with project funds. In this way, we were able to follow implementation activities for a period of three to four years, and identify for amplifying, consolidating, or replicating impact, as well as any related challenges.

One of the first steps was to set up a scientific committee to select the most pertinent disaster-risk reduction initiatives that emerged in informal contexts in the four locations. The committee design selection criteria prioritized initiatives led by women but also funded initiatives with mixed or male leadership. Terms of reference were given to local academics to determine management requirements and issues of research ethics. But local leaders had freedom to use the resources as they wanted. Each local leader received CAN\$4,000 that could be used for implementation, consolidation, or scaling-up the initiative (see Table 4).

Table 4. Summary of local initiatives, including type of risk addressed and response deployed.

	Code	Bottom-up initiative	Location	Type	Flood	Sea-level rise	Landslides	Droughts	Pollution Air/Water	Food insecurity	Deforestation	Crime and violence	Urban agriculture	Sports and recreation	Art and culture	Education and training	Infrastructure	Anthropocentric	Anthrop. and environment	Environmental
Cuba, U. Central	MP-CU-01	Resilient housing through community self-management	Carahatas, Cuba	A		●											●	●		
	MP-CU-02	Community group Mujeres del Mar (Women of the Sea)	Carahatas, Cuba	A		●										●	●	●		
	MP-CU-03	Circle of interest Yo me adapto	Carahatas, Cuba	A		●						●				●	●	●		●
	MP-CU-04	Coastal marine festival	Carahatas, Cuba	A		●										●	●	●		●
	MP-CU-05	Community social networking group Voces de Carahatas	Carahatas, Cuba	A	●	●		●									●			●
Concepción, Chile U Bar-Bio	MP-CH-01	Vertical community garden	Concepción, Chile	A						●		●	●				●		●	●
	MP-CH-02	Pottery workshop	Concepción, Chile	A	●					●		●				●	●		●	●
	MP-CH-03	Natural mitigation and irrigation barrier	Concepción, Chile	A		●		●											●	●
	MP-CH-04	Botanical illustration workshop	Concepción, Chile	A							●					●	●			●
	MP-CH-05	Classrooms in natural environments	Concepción, Chile	B					●		●					●	●			●
	MP-CH-06	Forest therapy	Concepción, Chile	B							●	●				●	●			●
	MP-CH-07	Plaza Nonguen	Concepción, Chile	A							●	●				●	●	●	●	●
	MP-CH-08	Estuary dome	Concepción, Chile	A					●		●	●	●	●		●	●	●		●
	MP-CH-09	Water recovery demonstrations	Concepción, Chile	B	●			●	●		●		●	●			●	●		●
Cali, Colombia, U Valle	MP-CO-01	Sustainable urban drainage system (SUDS) (I and II)	Yumbo, Colombia	A	●		●				●	●		●			●		●	●
	MP-CO-02	Water management system	Yumbo, Colombia	A	●		●							●	●			●		●
	MP-CO-03	Community gardens	Yumbo, Colombia	A			●			●	●			●					●	●
	MP-CO-04	Reforestation Yumbo	Yumbo, Colombia	A			●	●			●						●			●
	MP-CO-05	Family garden (I and II)	Yumbo, Colombia	B						●				●					●	●
	MP-CO-06	Reforestation Guanabitas (I and II)	Yumbo, Colombia	B			●				●						●	●		●
Salgar	MP-CO-07	Ecosystem adaptation	Salgar, Colombia	B			●				●				●	●				●
	MP-CO-08	Managing the risk	Salgar, Colombia	A					●		●					●	●		●	●

With our implementation strategy, we anticipated the opportunity to enhance three types of actions:

- Design-based DRR and Climate change adaptation (CCA) solutions, where creative work—based on design activities and charrettes—contribute to develop innovative solutions that have a cultural and social pertinence;
- Community-based DRR and CCA, where social groups lead actions with limited or no technical support by professionals, and;
- Ecosystem-based and Nature-based DRR and CCA solutions, focused on environmental protection and/or the use of green infrastructure to reduce risk.

Our research method explored how impact is achieved and what factors hinder or enhance it in informal settings. The action arising from the initiatives was recorded in videos, reports, transcripts, diaries, and a six-page report written by local professors. These reports were then analyzed by two researchers not involved in the initiative, providing an internal process of validation, triangulation, and peer review. All micro-projects are documented in the publication *Artefacts of Disaster-Risk Reduction*, edited by David Smith, Benjamin Herazo, Gonzalo Lizarralde, and Lisa Bornstein (see [here](#)).



Fig. 7. Canadian and Cuban students working together with a community leader during the design workshop in Cuba in 2019.

3. International and collaborative design workshops: Fostering empathy and recognizing emotions

One of the main problems in informal settlements in LAC is that there are not enough physical improvement projects. When improvements are planned, they are often conducted from the bottom-up and formal master plans are abandoned before completion. There are multiple bottom up interventions, but they often remain isolated, are ignored by decision makers, lack support, and become anecdotal.

ADAPTO aimed at filling this gap. Our approach combined empirical research with implementation and pedagogy (see Table 5). We engaged in project-based creative work in which

students in architecture, geography, engineering, and urban planning explored agency to transform informal settlements. Empirical research fed creative work in design studios, while design activities informed implementation and helped devise prospective scenarios for change. Design proved to be fundamental for improving Type A micro-projects.

Fieldwork included analysis of photography, video-recorded walks, and field observations; dialogue with residents, team members, and diverse experts; journals and debriefing discussion; and design charrettes. In these intensive charrettes, students conceptualized, sketched, elaborated, and eventually presented proposed site interventions through plans, diagrams, renderings, and architectural models.

Table 5. Summary of workshops held in each location

	Yumbo (2018)	Salgar (2018)	Carahatas (2017)	Santa Clara (2019)	Caibarién (virtual in 2020)	Concepción (2018 and 2019)
Leaders participating	6 local	4 local	Chile 2 local	4 local leaders +2 from Colombia and 1 from Chile		4 local
Researchers/ professors participating	20 from 4 countries	18 from 4 countries	6 from 2 countries	20 from 4 countries	6 from 2 countries	4 local professors
Students participating	14 local, 16 from other participating countries	2 from other participating countries	12 local, 18 from other participating countries	10 local, 16 from Canada	14 from Canada	20 local
Hours of meetings with leaders	16 over 6 days	6 over 3 days	6 over 3 days	24 over 6 days		20 over several days
Hours of presentation by community leaders	3	3	3	6		3

We combined traditional qualitative research activities with field workshops, charettes, short courses, and studios (see Fig. 7). These activities were meant to help foster empathetic approaches to design outside of university classrooms. In some cases (Yumbo and Concepción) there was hands-on work, with students participating in the construction of micro-projects. In design workshops, students from different countries engaged in dialogue with residents and local leaders, and by listening and discussing with them, developed an understanding of local conditions, as well as people's needs and aspirations. Through visits, discussions, and observations of housing conditions, students and professors were invited to learn about local rituals, practices, and values.



Fig. 8. Project conducted by Masters students for Carahatas, Cuba (Students: Jade Lachapelle, Ariane Paradis, Patrick Padneault).

The goal was to help students to deepen their capacity for empathetic and ethical design practice. Through reflection, the students were invited to challenge their own preconceptions and confront their own feelings. During feedback sessions, and a final dialogue with residents, students and other stakeholders were challenged and invited to reframe problems. Their designs had to respond not only to technical needs but also to social, physical, and cultural contextual characteristics. See the table below for details on each design workshop.

In all cases, we focused on bottom-up climate change responses and the hardships faced by those living in informal settings. We also explored limits on stakeholders' capacity to respond to common challenges and included issues of equity/inequality and privilege/exclusion in our analysis. In all design workshops, we looked at three levels of empathy: standing in another's shoes, connecting with others, and designing alongside others involved in change. Each workshop included four main phases which echo the four stages of design action adopted by Kouprie and Visser [61]: discovery, immersion, connection, and detachment:

1. Empirical research prior to the workshop (see previous section): normally at least six months of prior research and data collection.
2. On-site sessions of creative work that brought together students from different countries and disciplines, inviting them to interact with local communities, institutional actors, professionals, and other stakeholders and challenge them to respond—via design—to a specific

context. We conducted intensive charettes, which are a “common practice in engineering, architecture, interior design, industrial design, community development, and municipal planning.” Charettes provide “opportunities for individual or collaborative problem solving relative to complex, contemporary issues” [59].

3. Presentations of creative work: Students presented their initial reading of the situation and design proposals to local stakeholders—representatives from municipalities, planning agencies, NGOs, and local leaders—for critique and validation. They received feedback and there was space for discussion.
4. Adjusted proposals: In the final stage, after debriefing sessions, students incorporated the recommendations of local stakeholders and considered local regulations, pertinent standards, and applicable laws. We also shared the design solutions with municipal and planning officers, local leaders, academics, and NGO officers.

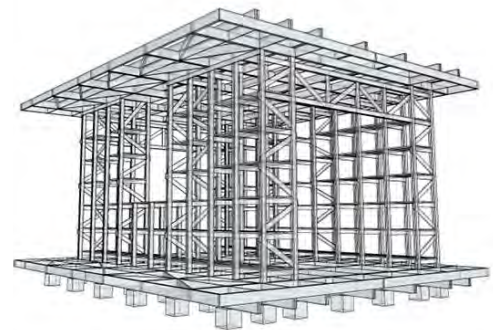


Fig. 9. The Vertical Community Garden in barrio Bellavista, Tomé, Chile, and drawing by Chilean students.



Fig. 10. Example of a project conducted by a Chilean student.

4. Narrative analysis: The stakeholders and their stories

As we will see in the following sections that we found significant differences in the way residents in informal settings, academics, and government officials explain risk and disasters. These variations were not anticipated at the beginning of the project. But, given this reality, we turned our attention to analyzing the narratives adopted by local people. We saw narratives as communication tools that people use to express claims, obtain access to resources, or conduct interventions aimed at disaster-risk reduction [63, 64]. Building on the work of Moezzi, Mithra, Kathryn B. Janda [65], we used narratives as data objects to gather, analyze, and critique ongoing phenomena.

According to Paschen, Jana-Axinja and Ray Ison [66], "Narrative research offers an innovative, holistic approach to a better understanding of socio-ecological systems and the improved, participatory design of local adaptation policies." We saw people's stories as "ideological work," deeply connected to history, values and social conditions [67] (see Fig. 11). Through this work, we wanted to identify multiple "ways of knowing" (Pinnegar & Daynes, 2007). Following the method of Empathy-Based Stories [68], we reflected on narratives expressed by citizens and those adopted by authorities in their discourse, policy documents, and regulations. Then we compared them with the narratives adopted by scholars in academic papers and grey literature.

During the international workshops we spent a significant amount of time ensuring that foreigners understood the deeper meanings of local practices, rituals, and values. For each case study, we reviewed about 20 press releases, official documents about DRR, and climate change reports. We analyzed meanings, representations, and values as expressed in Latin American Spanish and Haitian Créole. We conducted word counts in policy documents and reports in an effort to

identify recurring terms (seen as categories of analysis), such as: resilience, adaptation, adaptive capacity/ies, defence, security, social change, vulnerability, poverty, exclusion, marginalization, and protection.

Our objective was not to judge the legitimacy of claims but to understand the tensions that different narratives might engender. In order to analyze the data, it was necessary to constantly revise fieldwork notes, re-analyze transcripts, and re-visualize or listen recorded meetings with focus groups again. We then identified concept categories, and recurrent ideas and connections between concepts. Local teams in each location worked with Canadian researchers in critical discourse analysis [69]. Data was analyzed independently by the local and Canadian groups of researchers. First, local teams identified categories and compared them. Then, we exchanged researchers between locations (see next sub-heading regarding exchanges). We organized four meetings of researchers to facilitate data exchange and analysis. Four local leaders from Colombia, Chile, and Cuba participated in a meeting in Cuba in 2019 to review and validate early results. Transcripts of interviews, meetings, and focus groups were then analyzed through subject categories in English. Finally, Canadian researchers conducted several hours of conversations (via telephone, WhatsApp, and in Zoom meetings) with local leaders and researchers to validate terms, adjust arguments, and find and evaluate nuances.

These stories eventually helped us reveal: (a) local perceptions of risk and social transformation [70]; (b) how local residents wish to improve their living conditions [63]; (c) tensions in governance structures [66]; and (d) claims by local leaders and citizens in informal settlements [71]. We eventually brought all the results together and compared them with empirical data obtained from other activities in order to identify patterns and draw generalizations [72].



5. Training: Reinforcing local capacities

With the help of Corporación Antioquia Presente, we developed a training program for local leaders in Yumbo, Salgar, Concepción, and Carahatas. The methodology harnessed the existing knowledge of leaders and members of civil society, based on their challenges, experiences, and socio-cultural particularities, and using creative tools for reflection and analysis. In each training session, participants assumed an active role in building knowledge and capacities through which social transformations can be achieved. The approach also included “learning by doing” activities, where new knowledge is attained through experimentation, creativity, and critical thinking. This approach allowed participants to build from personal experiences, exploration, trial and error, and other techniques that promote understanding, retention, and appropriation of new knowledge and skills.

Training sessions typically lasted two days and included site visits; they were structured around customized content from five modules aimed at local empowerment. Themes included: (a) personal competence development: empathy, communication, creative thinking, and conflict resolution; (b) facing common challenges, which included aggression, abuse, marginalization, poverty, and violence; (c) community organization, which included leadership, delegation, committee organization, participation, and citizenship; (d) adaptation to change, which included housing conditions, and domestic and collective settings; and (e) livelihoods,

which included income generation, financial support, business development, and project initiation. Certificates were given to all trainees and Corporación Antioquia Presente presented a report for each training initiative, highlighting success factors and challenges.

Figure 12 summarizes the process we adopted to build stronger theory, more powerful and reliable methods, better policy, and more appropriate teaching activities, as well as to build leaders' capacity to deal with risk. The figure has two main components: case studies and micro-projects. The graph is also divided into five main stages that were conducted in various iterations: Theoretical framework, Empirical work, Implementation, Design, and Evaluation and Adjustments.



Fig. 11. Students practising architecture and urban planning (and soccer) in Yumbo, Colombia

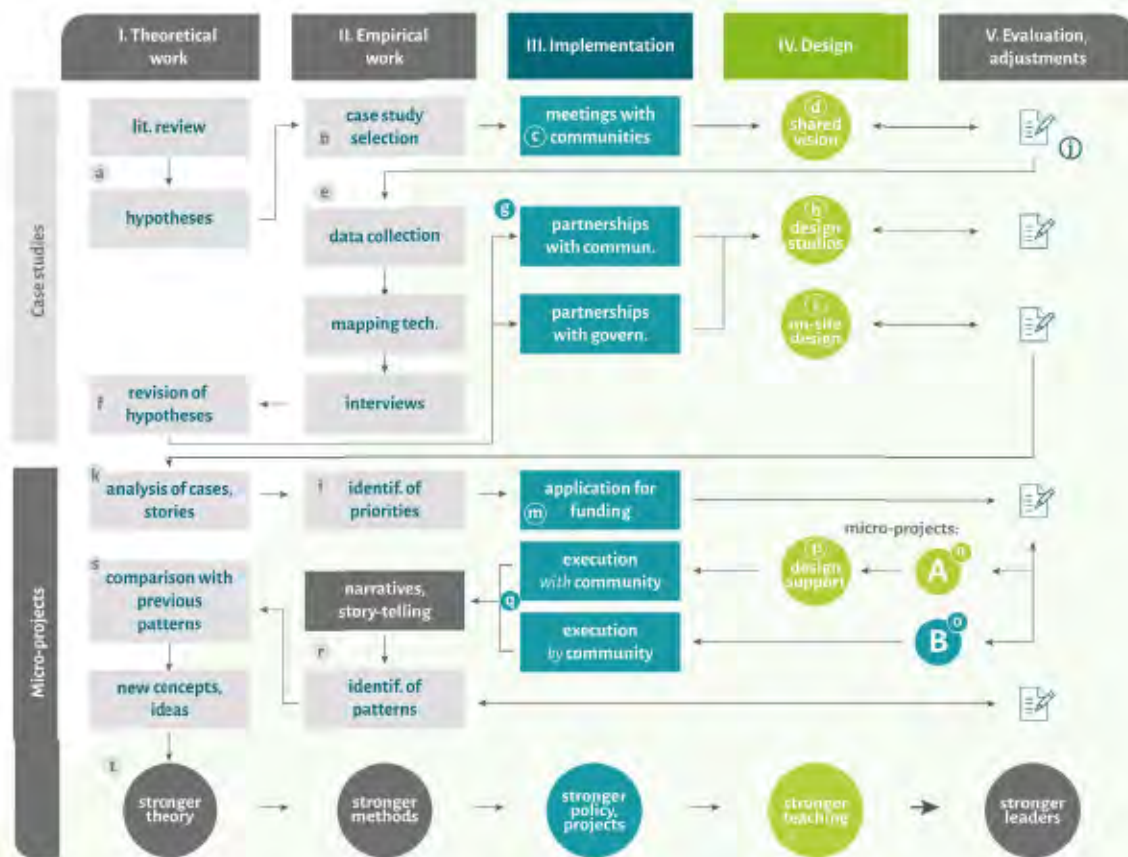


Fig. 12. Synthesis of the Research Methods adopted for the ADAPTO project

4. Results

“Narratives of social change, aspirations and social status are increasingly masked in disaster-risk explanations. Tensions are also concealed, including those regarding the winners and losers of interventions and the responsibilities for disaster risk reduction.”

Gonzalo Lizarralde et al., 2020. Open acces [here](#)



Table 6. Main results obtained in each project plan.

A. Knowledge Plan	Implementation			E. Dissemination Plan
	B. Partnership Plan	C. Micro-Projects Plan	D. Training Plan	
<p>5 case studies completed;</p> <p>4 international workshops organized;</p> <p>47 student internships and scholarships assigned;</p> <p>102 travel scholarships assigned to students;</p> <p>65 mobility grants assigned to professors and researchers.</p>	<p>South-South knowledge/ experience/ expertise sharing;</p> <p>Resources originally designated for travel were reallocated to scholarships in Latin America.</p>	<p>25 grants allocated to local leaders to support their bottom-up initiatives; production and dissemination of 12 videos about bottom-up initiatives, 6 internships.</p>	<p>3 workshops focused on capacity building for local leaders; Participation of local leaders in local committees; impact on 12 undergraduate and graduate courses and studios</p>	<p>Publication of a unique online database; results published in 2 books, 13 journal articles (plus 2 more in preparation); 1 op-ed article; 29 academic presentations; 10 presentations to local partners and government; 38 interviews and participations in media; 20 videos of dissemination; influence in 15 policy documents; publication of 11 policy and practice briefs and 3 construction guidelines.</p>

Table 6 summarizes the main results obtained in each project plan.

A. Knowledge Sharing and Creation

We conducted five qualitative case studies in Yumbo, Concepción, Canaan, Salgar and Carahatas (find them [here](#)), which revealed how several socio-political conditions increase the vulnerability of citizens living in informal settings. These include stigma, gentrification, urban beautification plans, and inappropriate housing and DRR policies. Dozens of students from disciplines such as architecture, ecology, geography, graphic design, sociology, civil engineering, and social work, among others, analyzed the different adaptations to climate change in urban settlements within their own academic projects.

We awarded more than 100 mobility grants, 36 masters and undergraduate scholarships, six internship fellowships, and nine doctorate scholarships. Besides, we noticed that,

in some places, insufficient access to computers is a major barrier to successful completion of student research projects. We therefore provided eight laptops to the most promising students working in collaboration with our project. The criteria and methodology for selecting the best students were defined by the Scientific Committee. Fulfilling the planned activities A.2 and A.3 has allowed leading students to apply their skills and share knowledge from the research and practice-oriented components of the project.

Currently, climate change adaptation in informal settings has been introduced in eight architecture and engineering courses and four urban planning courses at partnering universities. It has also been introduced as a subject taught in five architecture studios and four urban planning studios. In addition, six additional design studios were held in Cuba and Chile.

We implemented a strategy that sought to bring together scholars and non-academic partners from different locations and institutions, creating multidisciplinary sub-teams where they could collaborate for periods of two to three years. These partnerships were meant not only to break down the traditional disciplinary (silo-type) production of knowledge but also to create original perspectives and put new knowledge into practice.

By creating several spaces for open dialogue and exchange, the project facilitated the development of communication skills among local leaders, officers, decision makers, and academic partners in Colombia, Cuba, Chile, and Haiti. Academic events allowed us to validate the integration of new knowledge into local strategic plans. In Colombia, for example, the Corporación Antioquia Presente held an International Symposium on Climate Change and Health Challenges on September 2019. Motivated by the tagline “Imagine a more informed and resilient world in the face of climate change,” 200 attendees from Costa Rica, Chile, Uruguay, Canada, Spain, and Colombia, among others, shared experiences and new knowledge on climate change mitigation and response. The academic event was organized in collaboration with the Universidad de Antioquia National School of Public Health, the Risk Management Direction of the Office of Health and Social Protection of Antioquia, the Environmental Health Program of the Office of Health of the Mayors Office of Medellín, and the NGO Salud sin daño. The event sought to integrate environmental public health into both public and private institutional efforts and to encourage collaborative construction and implementation of actions to address new challenges in adaptation, mitigation, and resilience to climate change. Participants discussed vulnerability and adaptation to the realities of climate change and potential mitigation measures.

ADAPTO reinforced a pedagogical and research agenda in the region, focused on the understanding of social and environmental injustices and the use of design and creativity to overcome common challenges. Our knowledge plan has set up academic and research programs that produce local knowledge on disaster-risk reduction and climate change response, reducing the necessity to adopt imported ideas, concepts, and theories. In this way, ADAPTO has been able to reveal local interpretations of risk and disasters that can constitute new epistemological frameworks, and that sometimes differ from framings and ontologies traditionally adopted in the Global North. An external evaluator noticed that ADAPTO was successful in adopting “epistemological flexibility,” to respond to local conditions and adapt research strategies to on-the-ground realities. This approach permits to explore phenomena from conceptual lenses that are grounded on local residents’ interpretations and explanations about informality, risk, danger, and development, avoiding the use of foreign concepts and ideas.

Our work has been inspired by the networking and research activities conducted by the Latin-American group La Red in the 1990s and 2000s, which also challenged traditional epistemologies of risk and disasters from knowledge obtained from case studies in Peru, Colombia, El Salvador, Ecuador, and other countries in South and Central America, see for instance: [73-77]. ADAPTO has contributed to establish a new generation of scholars who—much like those who were part of La Red—can now produce scientific knowledge that not only emerges from an in-depth understanding of local conditions but can also challenge interpretations and concepts that are developed in the Global North and are indiscriminately applied in the Global South.





B. Partnerships and Structured Dialogue

In all our activities of implementation, knowledge creation, and knowledge exchange, we included local organizations and, in some cases, regional and national authorities. This collaboration was possible through the mediation of local professors and research labs. Our results confirmed that local leaders in informal settings in the three countries share similar implementation challenges, including limited technical and economic resources, insufficient influence in policy and municipal management, and risk of stigmatization, and even persecution.

We also validated our initial implementation premise: that policy makers, decision makers and implementation agencies in Latin American and Caribbean cities often do not need prescriptions, but rather innovative platforms that foster meaningful dialogue, empower communities, and inspire change. In fact, we found that local government officials sometimes have the necessary know-how to formulate climate change adaptation plans and policies through top-down processes.

What many of them lack is tools to identify and integrate bottom-up initiatives in plans and policy and to navigate implementation barriers and challenges. In view of this reality, we worked together with both non-profit organizations and government institutions to create scenarios of structured conversation and identify ways to overcome implementation barriers. Local professors in Cuba, Chile, and Colombia were in constant communication with officers in municipal and national urban planning agencies. To be sure, sometimes these efforts were successful, while other times they were less so. Below are some examples of partnered action with local institutions:

In Chile, new alliances were created between academic partners and the *Laboratorio de Gobierno Local para la Región del Bío-Bío* and the *Departamento de Medio Ambiente* in Concepción. These alliances permitted to influence municipal policies and strategies. ADAPTO became a member of the *Círculo de innovación Pública*, *Laboratorio de Gobierno Local para la Región del Bío-Bío*. This network promotes cooperation for innovation in public management in collaboration with representatives of

the regional government, universities, municipalities, and the private sector. In addition, in 2019, a group of municipalities, universities, and private companies created the *Observatorio Territorial de Cambio Climático*. This Observatory studies social and physical conditions in the territory and how to deal with climate change by gaining understanding of land and ecosystems. Its goal is to help minimize climate change effects, mitigate potential risks, and seek social benefits for the Bío-Bío region. By involving community members, the Observatory is able to constantly monitor the social, economic, and physical effects of global warming.



In Cuba, ADAPTO helped build a stronger alliance between university partners and the Municipal Government of Quemado de Güines. This partnership has emerged against a backdrop of decentralization and enhanced independence for national authorities—both of which favour the adoption of municipal policies and actions derived from the transfer of results from ADAPTO.

Cuba's National Plan for Adaptation to Climate Change, called *Tarea Vida*, provided a valuable framework to enhance collaboration between ADAPTO team members, the Ministry of Science, Technology and Environment (CITMA), its provincial delegation in Villa Clara, and the municipality of Quemado de Güines. In 2020, the Cuban National Institute of Physical Planning, partnered with UN-HABITAT to hold a workshop in

Quemado de Güines to evaluate local strengths, challenges, and opportunities for the implementation of the New Urban Agenda in Cuba. The institutions identified ADAPTO and the Carahatas case study, as key sources of knowledge that can be applied to housing policy and environmental actions in the face of rising global temperatures (see Fig. 13).



Fig. 13. Two local researchers meet children after school to discuss the micro-project in Carahatas, Cuba.

In Colombia, particularly in Yumbo and Salgar, ADAPTO has become a platform for structured dialogue between the community, municipalities, and the private sector.



In Yumbo, this has been achieved through the establishment of alliances to design and execute interventions in public spaces in informal settings and to implement training programs financed by the local government and local companies (see Fig. 14). ADAPTO was a source of seed capital for promoting new community-led collaborative work.

Moreover, ADAPTO is now recognized as a management mechanism that—since it is facilitated by academic institutions—has neutral interests (in contrast to the high level of clientelism found in other institutions in Yumbo). ADAPTO influenced the implementation of the Municipal Climate Change Adaptation Plan, conducted in collaboration with the Secretary of Education and the Unidad municipal de asistencia técnica, UMATA.



Fig. 14. Example of a collaboration agreement signed by more than 50 participants in Yumbo in 2018.

In Salgar, our team made several presentations to the academic community and government institutions, which allowed Corporación Antioquia Presente to strengthen its legitimacy in issues related to climate change. At the Public Policy Advocacy Table of the Antioquia Federation of NGOs, Corporación Antioquia Presente presented ADAPTO as a model for the work of NGOs that work in areas of extreme vulnerability. Similarly, during the process of accreditation as an NGO by the European Union, the Corporación Antioquia Presente introduced ADAPTO as an example of culturally-sensitive international cooperation (this model allowed it to obtain points for accreditation as an NGO in Europe). Finally, the Corporación Antioquia Presente became a member of the Social Commission of the Municipal Council of Disaster Risk Management of Medellín, where it influenced the formulation and implementation of public policies for risk management.

In Cuba, Colombia, and Chile, the internships and exchanges became pertinent social practices, insofar as knowledge creation and exchange was framed by cultural and social factors. They produced valuable social relationships and contributed to establish trust among partners. Internships required conscious, creative, and sometimes risky decision making, as well as the development of skills for both leadership and followership. Interns had to be prepared not only to use the theoretical and instrumental tools, but also to adopt attitudes of autonomy, team collaboration, and commitment. They were invited to learn how to navigate sudden challenges and fragmented information, and to simplify and explain scientific concepts to laypeople, contributing through collaborative work to the development of new knowledge. The challenges experienced by interns required constant reflection on action and provided a space to explore the limits of professional practice in architecture, engineering, design, and urban planning.

Work in Haiti: Understanding bottom-up agency in Canaan, a new post-disaster city

From 2015 to 2020, ADAPTO researchers worked in close collaboration with colleagues at the Université d'État d'Haïti to carry out research on the urbanization of the metropolitan area of Port-au-Prince. Three graduate students and two professors from Université de Montréal in addition to a senior professor and about 15 Masters students from the Université d'État d'Haïti participated in the study.

During that period, data collection was supported by other projects funded by the European Union, the American Red Cross, and the Université du Québec à Montréal (UQAM). The Université d'État d'Haïti, the American Red Cross, and UN-Habitat facilitated access to data and respondents. Through these institutions, ADAPTO researchers met numerous community leaders, and decision-makers in government, international agencies, and NGOs.

Unfortunately, in 2019, the security situation in Haiti became unmanageable. Local institutions were paralyzed by riots and social unrest, and international travel was blocked. Due to the complex security and logistic situation, we decided to keep Haiti only as a research case and not to engage in implementation activities on the ground. Despite social unrest, the ADAPTO team managed to maintain contact and communication with local research colleagues, but it became impossible to begin new empirical research activities. This said, the research activities that were accomplished before 2019 inspired new collaborative initiatives between local institutions and Canadian and European universities.

From 2017 to 2020 our work focused on Canaan, a settlement of nearly 300,000 inhabitants located 18 km north of the capital (see Fig. 15). Canaan was built, mostly by local residents through informal activities, after the 2010 earthquake that destroyed

Port-au-Prince. During that period, a doctoral candidate from Université de Montréal conducted empirical research, keeping close contact with local leaders in Onaville (a deputy coordinator of the Onaville District Table), Corail-Cesselesse (a member of the Table de Quartier de Corail), and the director of the Community Resources Center of Croix-des-Bouquets. In a 2020 article published in the prestigious international journal *Cities* (open access [here](#)), Anne-Marie Petter and colleagues argue that Canaan has become a relatively functional city without administrative recognition. It is also an example of creative local agency and an example of how citizens and NGOs try to fill a governance void left by the State. For these authors, Canaan is consequence of a tacit state policy that has allowed for an urban development vacuum to arise in the country and that has been both the cause and the consequence of social marginalization and vulnerability for low-income citizens. As a result, those affected by increasingly frequent disasters have no choice but to create autonomous urban solutions in a demonstration of extreme resourcefulness and creativity.

Traditional top-down approaches to urban development and planning in Haiti have exacerbated the conditions for widespread informal urbanization. They have also failed to respond to the needs and expectations of those living at risk in informal settings. Canaan is a unique case of rapid peri-urban, informal development in post-disaster contexts in Latin America and the Caribbean. It is arguably not a good case to look at in terms of replicability when it comes to ways to build housing, urban systems and solutions in other countries in the region. But it is a case that offers the possibility to learn from self-built activities and attempts to establish housing and urban systems through bottom-up collective agency in the absence of direct investment from the State. The case of Canaan shows that working within local social structures and legitimizing the action of local leaders is key to enhancing positive change in informal settings and fostering more democratic governance structures.



Example: Initiatives that succeed in reforesting Canaan—and others that fail.

By Anne-Marie Petter

A recent study shows that 73 percent of residents in Canaan see the lack of trees and greenery as the worst environmental problem they face. This concern is visible in the greening and reforestation efforts undertaken every day by Canaanites. On a household level, residents plant vegetables, edible plants, and fruit trees in their yards. On a collective level, they organize *konbits*, or collective efforts which often include meals and social activities. Through such efforts, Canaanites have not only improved public spaces but have also built several drainage channels and culverts, and have solidified water shores. Given Haiti's rampant deforestation and the water scarcity in Canaan, these initiatives are becoming increasingly relevant.

To be fair, several local endeavours serve personal interests too. Some local leaders make business out of them and it is fair to say that most of their initiatives are tactical and small-scale rather than strategic and replicable on a large scale. But in an aggregate sense, planting and greenery activities contribute to disaster-risk reduction in Canaan. They reduce heat islands and risks of drought, help retain water and soil, and transform carbon dioxide into oxygen.

In contrast to these bottom-up solutions, a recent top-down project led by NGOs in Canaan delivered mixed results. The idea—presented as a climate change adaptation goal—was to plant small forests in about 20 public spaces. NGO officers used indigenous species because of their resistance to drought and they also favoured goat repelling weeds, since Canaanites practice free breeding. The concept seemed appropriate and sustainable at first glance, but it met with significant resistance among residents. Canaanites disliked the idea of using indigenous desert-like trees for greening public spaces. They would have preferred fruit trees, “nice to look at and good to eat,” rather than what they called “ugly and useless bushes.” Residents despised the local shrubs and plants that supposedly repelled the wandering hungry goats. Moreover, the local implementation committees failed to respect the original planting specifications which required a dense and free layout, favouring a looser and more orderly arrangement of plants in rows. This caused a disequilibrium in the system and the plants eventually died.



Bottom-up planting and greening initiatives in Canaan.

Why did this climate adaptation initiative fail? Lack of appropriation by local residents surely played a role. Even if residents' visual concerns may have seemed silly to the external observer, they should not have been ignored by NGO officers. Part of the reason can be found in our upcoming PhD dissertation, which reveals that Canaanites are fighting a “slum stigma.” Our research shows that residents make substantial efforts to shield Canaan from such a negative representation in the Haitian context (open access [here](#)). Therefore, they try to adopt standards and urban solutions equivalent to those found in the “real city.” Being more attentive to local narratives and concerns—and not only to the superior virtues of the “mini-forest” concept—could have enabled this reforestation initiative to succeed.

This case reminds us that top-down initiatives can fail when they ignore local practices and residents' expectations and claims. Pre-established paradigms and foreign narratives (about sustainable reforestation, for instance) conceal local specificities, concerns, and priorities, leading well-intended and well-funded initiatives to fail. There are multiple ways of addressing climate change effects and risk, and many of them are not (and should not be) linked to the overarching paradigms of sustainability, climate adaptation, and resilience. Abstract concepts and jargon often add little value to local practices and may even obscure them. To succeed, actions must be rooted in local perceptions, needs, ideas, expectations, and local experience.

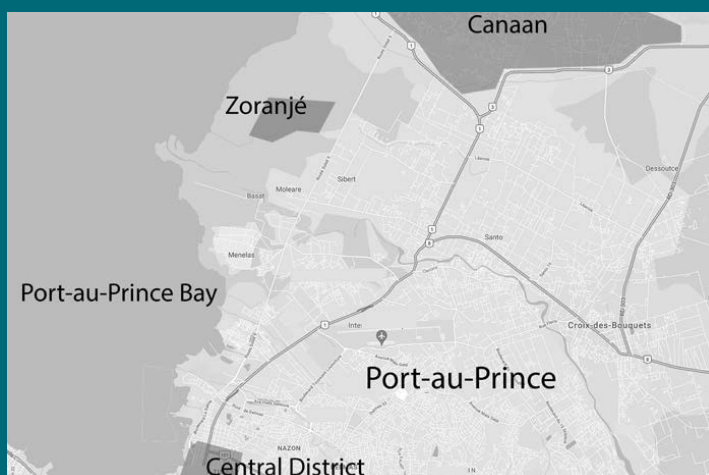


Fig 15. Map of Metropolitan Port-au-Prince, showing the location of Canaan



Fig. 16. Residents working on the micro-project Sustainable Urban Drainage System in Yumbo, Colombia

C. Implementation and Bottom-up Initiatives

Micro-projects were an essential component of our implementation plan in Colombia, Chile, and Cuba. ADAPTO adopted an original research and implementation approach to explore how different climate-related risks affect—and are affected by—“artefacts of disaster risk reduction.” We coined this term to refer to the existing (but also potentially necessary) objects, rituals, practices, events, and spaces that have social value and that, in the face of risk, help connect people, meanings, and agency in a given space. By funding micro-projects in Latin America and the Caribbean, ADAPTO is revealing the new “geographies of risk” that operate in informal settlements.

Micro-projects were a research method, a way of connecting partners and community, an implementation output, and a source of data. But more importantly, micro-projects were spaces for open dialogue and the generation of trust between stakeholders. They represent collective efforts that have meaning for local residents and produce culturally relevant value in informal settlements.

ADAPTO micro-projects were created in informal settlements where residents had acted in response to a risk or disaster, where they had reached a milestone in upgrading a neighbourhood, or where they had been affected by a tragedy. ADAPTO explored how to scale up these local solutions in order to improve disaster-risk reduction policy in the region.

By identifying and funding micro-projects, ADAPTO revealed connections between risk management strategies, objects, spaces, and activities that appear unrelated at first glance.

Through the IDRC funds, ADAPTO funded 22 micro-projects in four locations in Colombia, Chile, and Cuba. Each project received CAN\$4,000, and three of these received additional funds for a second phase. By following up these initiatives, our team could reveal which strategies of risk reduction worked best, why, and under which conditions. We were also able to identify why some local initiatives fail. Through our implementation plan (which also included training activities for local leaders and follow-up of investments in local initiatives), ADAPTO provided policy recommendations for scaling up grassroots solutions. It also drew up recommendations for better climate-change response and disaster risk reduction action in the region. Table 7 summarizes the main indicators of the implementation plan.



Table 7. Summary of participants, residents, researchers, and students involved in each initiative.

	Code	Bottom-up initiative	Leaders involved ^a	Residents potentially impacted ^a	NGOs participating in implementation activities ^a	Institutions involved ^a	Researchers (professors) involved ^a	Students involved ^a
Cuba, U. Central	MP-CU-01	Resilient housing through community self-management	1	215	2	3	3	2
	MP-CU-02	Community group Mujeres del Mar (Women of the Sea)	6	130	2	2	3	1
	MP-CU-03	Circle of interest Yo me adapto	4	150	2	2	3	2
	MP-CU-04	Coastal marine festival	3	500	1	1	3	0
	MP-CU-05	Community social networking group Voces de Carahatas	10	120	2	2	2	4
Concepción, Chile U Bio-Bio	MP-CH-01	Vertical community garden	7	90	4	4	8	15
	MP-CH-02	Pottery workshop	3	45	1	4	6	2
	MP-CH-03	Natural mitigation and irrigation barrier	1	45	1	2	4	0
	MP-CH-04	Botanical illustration workshop	2	35	2	2	2	3
	MP-CH-05	Classrooms in natural environments	3	40	2	2	3	0
	MP-CH-06	Forest therapy	1	80	1	3	4	20
	MP-CH-07	Plaza Nonguen	1	20	1	1	2	2
	MP-CH-08	Estuary dome	3	60	1	2	3	2
	MP-CH-09	Water recovery demonstrations	5	250	3	2	2	0
Cali, Colombia, U Valle	MP-CO-01	Sustainable urban drainage system (SUDS) (I and II)	8	250	1	3	2	9
	MP-CO-02	Water management system	8	150	2	3	3	9
	MP-CO-03	Community gardens	9	400	4	3	2	8
	MP-CO-04	Reforestation Yumbo	7	250	4	3	2	9
	MP-CO-05	Family garden (I and II)	2	175	2	3	2	3
	MP-CO-06	Reforestation Guanabitas (I and II)	2	75	3	2	2	3
Salgar	MP-CO-07	Ecosystem adaptation	8	160	8	4	2	1
	MP-CO-08	Managing the risk	5	300	6	4	2	1

^a These figures must be taken with prudence, because most leaders, students, residents, and stakeholders participated in more than one initiative. Therefore, they should not be counted more than once.

Two types of initiatives

Early on, we found the need to explore two types of initiatives:

Type A: Academically partnered – that is, initiatives where the local universities played a leading or supporting role and local academics and institutions helped communities design, plan, build, and manage the initiatives. These initiatives involved action research, with university students looking for solutions and collaborating on design activities with the community. The initiatives integrated knowledge developed through academic research and design practice. In addition, they benefited from ethnographic research methods and international design workshops, in which students from different countries explored technical solutions to improve the ideas identified by residents (see example in Fig. 16).

Type B: Locally driven – that is, initiatives completely led and coordinated by local leaders with very little involvement from local universities. Academics monitored the design, management, and execution of the initiatives and then conducted follow-up activities, such as investigating the strategies deployed by residents, and observing and documenting the development of design, planning, and construction activities.

We found that these bottom-up initiatives ultimately seek to:

Demonstrate the importance of creating new spaces for open dialogue, social integration, and discussions about equality and social justice;

Illustrate original ways of creating healthier relationships between humans and the built and natural environments;

Reduce a wide range of threats, from violence and crime to food insecurity and air pollution;

Recognize women's role in disaster risk reduction;

Help eliminate political corruption and patriarchal and oppressive structures;

Challenge common foreign narratives of disaster risk reduction and response;

Recognize and celebrate local knowledge and skills (as opposed to ill-adapted imported practices and solutions);

Produce changes in policy to reduce inequalities, segregation, marginalization, racism, and other social injustices;

Challenge neoliberal and economic models that lead to inequality and that perpetuate oppression and poverty; and,

Demonstrate that the climate agenda in informal settlements in Latin America and the Caribbean cannot be separated from local struggles for social justice.

Work in Carahatas, Cuba: An opportunity to understand the deep connections between people, housing, and the ocean

"The ocean has never harmed me. People have".
Local leader in Carahatas.

Our activities in Cuba focused on Carahatas, a coastal fishing community in the northern littoral (see Fig. 17). Like many of the fishing communities in the Caribbean (see Fig. 18), Carahatas has been challenged by the increasing frequency, duration, and intensity of hurricanes as well as the cumulative stress associated with rising sea-levels. The initial approach taken by state actors was to look for appropriate relocation strategies for the communities to ensure their safety and resilience. However, over the four years of work with ADAPTO researchers, villagers lobbied to remain on the coast to continue their traditional livelihood of fishing. They also engaged in affordable housing resilience projects, participated in social media climate networks, and launched annual celebrations for the Women of the Sea.

Reinforcing local academic structures and supporting junior professors in Cuba

The Universidad Central Marta Abreu de las Villas in Santa Clara hosted the ADAPTO research team in Cuba. One of the ADAPTO team's main challenges was navigating between national, provincial, and local institutions to communicate and translate the different visions and narratives about risk, people's

relocation, disasters, and the value of the territory.

Personal experiences, travels, and exposure in academic events enriched the emerging careers of junior professors in Cuba. In addition, local researchers and students benefited from international networking, laptops, communication equipment, access to academic databases, and internships provided by ADAPTO.



Fig. 17. Map of Cuba, showing the location of Santa Clara and Carahatas.

One research intern from Santa Clara spent six months in Montréal working with the *Œuvre Durable* team. According to him, this internship helped him “develop new skills, expanded the limits of [his] personal development and create new academic relationships,” by pushing him to work outside of his comfort zone. He added that “the unknown can be challenging, but the ability to overcome difficulties along the way allows us to grow as professionals and as human beings.” Three other junior researchers from Cuba conducted research internships in Colombia, working at the Universidad del Valle and the Corporación Antioquia Presente. Another Cuban researcher participated in both the Cali and the Santa Clara seminars. Finally, a Cuban researcher and junior professor is now completing a PhD thesis on relocation strategies for coastal communities in Cuba.

The Universidad Central Marta Abreu played a key role in bridging institutional gaps, notably by collaborating with the Ministry of Construction, the Habitat II program, the Institute of Physical Planning and the National Unit for Risk and Prevention. Cuban team members demonstrated a remarkable ability to mobilize local and regional institutions and platforms such as the Civil defense, teachers, community architects, and sherfolk. The successful coordination between the different perspectives of the local, provincial, and national institutions, as well as the international experiences brought by ADAPTO members facilitated the implementation of changes in local policy. The work conducted in Carahatas had a profound influence on ADAPTO's overall approach to research and implementation. First, it triggered important reflections concerning how climate change is seen differently by different people and how narratives adopted by scholars and government officials



Fig. 18. A Sherman in Carahatas.

can obscure local priorities, needs, and expectations. Second, as they gathered increasing community influence, the micro-projects targets changed considerably. ADAPTO researchers were surprised by the community's interest and willingness to challenge the existing relocation policy, and to build disaster preparedness through creative housing reinforcement, social communication, and cultural celebration. The case exemplifies how local residents and leaders can engage in action aimed at modifying DRR national policy. Finally, the community built strength by engaging in the decision-making process with local government and making links to broader provincial and national policy.

The program Habitat II, funded by the Swiss Cooperation aims at improving housing conditions in Cuba. Led by professor Andrés Olivera, the program is active in 12 municipalities (mostly in the province of Las Villas), where it promotes capacity building and better housing policy. Habitat II became a key partner in ADAPTO activities and provided logistical and administrative support to overcome the challenge of transferring resources to Cuba. Habitat II also provided support to local design workshops and in-kind resources to conduct empirical research in Carahatas and Santa Clara. Several municipalities that are part of Habitat II, adopted lessons developed in ADAPTO and have now considered adopting the methods and approaches developed in our project.

Bottom-up initiatives in Carahatas

The five bottom-up initiatives in Carahatas were recognized by different governmental entities as examples of pertinent climate response (see Fig. 19). Most activities were developed by stakeholders in accordance with their initial plans. However, transfer of resources to local initiatives became difficult and therefore about half of the money devoted to micro-project grants was used to manage procurement and delivery of equipment from Canada and the United States. Not all local leaders received cash. Some benefited from construction tools,

computers, cameras, electronic equipment, mobile data, and cell phones that were sent from abroad by ADAPTO or were provided by Habitat II in collaboration with our team. The marine festival initiative could not get off the ground, as its main event (the festival) had to be postponed for a year due to COVID-19 restrictions. Below is a brief description of each initiative:

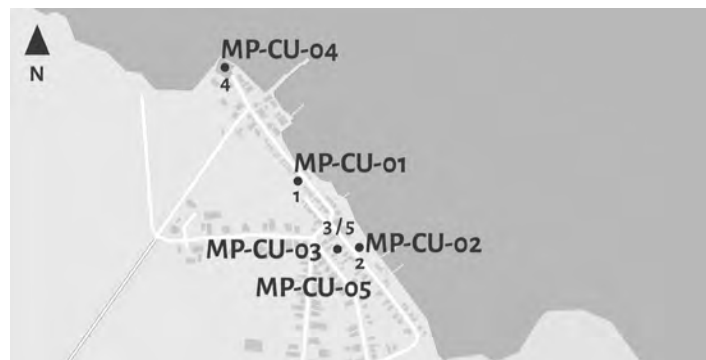


Fig. 19. Map of Carahatas, showing the location of bottom-up initiatives supported by ADAPTO

MP-CU-01. Resilient housing through community self-management (type A): This initiative seeks to reduce disaster risk through improvements to housing conditions in the village. It is one of the few cases in which leaders supported by the ADAPTO project opted to build housing solutions to reduce risk. This micro-project creates a "construction tool library" where villagers in Carahatas can borrow the equipment they need to upgrade their own homes (see Fig. 20). The initiative was led by women and conducted with the technical support of the local "Community architect" (a strong institutional actor in Cuba) and the Habitat II program. As a result, more secure, comfortable, and resistant houses have been built in Carahatas.

MP-CU-02. Community group Mujeres del Mar (Women of the Sea) (type A): This initiative builds on a strong cultural tradition in Carahatas: the annual Ocean Festival, an event that celebrates life close to the ocean and seeks to create awareness about environmental challenges in the region. This initiative aims to generate culturally relevant strategies for disaster risk reduction and environmental protection. To achieve this goal, ADAPTO provided guidance and technical support to the group of women that leads the traditional annual festival. In this initiative, education of young children is a way of creating sustainable change towards environmental protection.



Fig. 20. Community members receiving tools for the bottom-up initiative "Resilient Housing."



MP-CU-03 Circle of interest Yo me adapto (type A): This educational initiative seeks to create a permanent a ter-school curriculum on climate change in Carahatas local primary school. This curriculum includes weekly workshops to teach children basic concepts about climate change, adaptation, and resilience. ADAPTO and the local program Habitat II supported this initiative by providing equipment, knowledge, and technical expertise. The curriculum was designed and implemented by local women teachers. The initiative has the support of the Ministry of Science, Technology, and the Environment and the municipality. The initiative also incorporates interactive methods to promote training on climate change and to disseminate best practices.

MP-CU-04 Coastal marine festival (type A): The annual coastal marine festival is a key institution in Carahatas. It celebrates fishing, livelihoods related to the ocean, and peoples attachment to their territory. The objective of this micro-project is to support the festival, challenge popular risk perceptions about climate change effects, and explore strategies for upscaling local adaptation practices in coastal areas. The strategy, led by women residents in the village, is based on culturally relevant practices and is supported by both the IDRC and the local program Habitat II.

MP-CU-05 Community social networking group Voces de Carahatas (type A): This micro-project seeks to empower and lend a voice on social networks to the members of the community of Carahatas. The objective is to influence residents and decision makers through communication and dissemination of information, and to share opinions and experiences about responses to global warming effects. The project creates awareness about climate effects in coastal areas and serves as a platform of structured dialogue about possible

solutions to ongoing challenges. The Facebook site has more than 500 followers in Cuba and abroad.

Re lection of work in Cuba: The importance of continuity

The Cuban experience exemplifies the crucial role that women play in sustaining livelihoods, continuity, and stability in families and the community, despite risks and disasters. It also demonstrates the importance of international knowledge exchange and reflexive action in DRR. By iteratively building knowledge on climate risk and response, and by focusing on the reduction of climate risk on an international scale, the work emerging out of Carahatas has impacted ADAPTO researchers narrative on bottom-up initiatives, scale, and climate change adaptation.

The case shows how peoples desire for continuity and stability (despite risk) must be taken into consideration when planning and implementing climate change actions in the region.





Work in Concepción, Chile: The desire to establish a new social contract and better relationships with nature

Activities in Chile were led by the Universidad del Bío-Bío (see Fig. 21). The research, design work, and local initiatives focused on nature-based approaches to climate change action and ways of harmonizing the built and natural environments. Local researchers and community leaders approach to risk is influenced by their in-depth understanding of the territory and the complex water systems that exist in the Bío-Bío watershed. The city of Concepción and the Nonguén Valley have experienced severe flooding since 2006, with the last incident occurring in June 2021. These floods cause frequent damages to housing, public facilities, commercial buildings, and infrastructure. The ADAPTO researchers challenged the “resistance to natural hazards” paradigm by exploring community-led initiatives that look to redefine the urban dichotomy between humans and nature.



Fig. 21. Map of Chile indicating the location of Concepción.

The ADAPTO initiatives in the Nonguén Valley were the result of collaborative work between the artisan leaders of the community of Quinchamalí, the Quiero Mi Barrio (I love my neighbourhood) program of the Ministry of Housing and Urban Development, the Housing and Urban Development Service (SERVIU), the architectural firm Azócar & Catrón and the School of Architecture of the Universidad del Bío-Bío. A significant result was the formalization of an alliance between the community, State institutions, and academia in view of developing collaborative and inclusive approaches to infrastructure development policies that respond to the needs and opportunities of rural localities.

Impact on local researchers and ADAPTO team members

ADAPTO's work in Chile focused on explorations of pedagogy and the role of the university's capacity to create spaces of social and physical transformation through alliances with communities and government. The emphasis was on redefining the role of academia, centering it on support and dialogue with citizens, in view of responding to their needs, claims, and expectations. Community leaders brought their nature- and education-based approach to community development to the ADAPTO team. As a result, many of the interventions and workshops were small-scale and human-centered, drawing attention to natural features, such as the Nonguén estuary. Action was structured around educational activities, botanical illustration workshops, forest therapy, and the creation of spaces to experience natural environments within urban settings.

This work pushed the boundaries of traditional approaches to climate change adaptation. For instance, academics employed an “emotional” framing to their pedagogy and networking mission. In multi-actor settings, they invited institutional and community actors to recognize and respect the different

emotional experiences they were having, and to empathize with the emotional experiences of others. As a result, the researchers were able to witness successful outcomes to tense decision-making processes that juxtaposed institutional, expert, and local experiences and priorities.

Three of the ADAPTO researchers, together with a community member, proposed an original approach to link the socio-historical dimensions of disaster management to collective memory. Their research methods were based on interviews with women leaders in the Concepción community. In an article documenting the process, they reveal how women, often heads of households, developed adaptive responses during the 2005 and 2006 floods. They go on to analyze how the experience challenged traditional and ingrained social roles, while pushing women to develop "disaster memory" that has been helpful in managing and overcoming more recent disasters.

Two local students had the opportunity to complete internships in Colombia at the Corporación Antioquia Presente and Universidad del Valle. One of them held a series of interviews in Salgar and presented her findings on a local radio station.



Fig. 22. Map of Concepción, showing the location of bottom-up initiatives funded by ADAPTO.

Bottom-up initiatives in Chile: Connecting people, urban systems, and ecosystems

The implementation initiatives achieved the proposed goals (see Figs. 22 to 24). However, the last two initiatives that were approved could not be fully implemented due to the social situation that Chile has experienced since 2019 and the 2020 pandemic. Below is a brief description of the local initiatives conducted in Chile:

MP-CH-01 Vertical community garden, Barrio Bellavista, Tomé (type A): The vertical garden initiative arose from a collaboration between the community, the neighborhood upgrading program *Quiero Mi Barrio*, the Regional Ministry of Housing and Urban Planning of the Bío-Bío Region, and the School of Architecture of the Universidad del Bío-Bío. Through the implementation of small gardens in houses and public spaces, the project seeks to recover abandoned areas, promote sustainable practices of food security, restore the physical and social relationship between the neighbourhood and the edge of the estuary, and enhance people's capacity to enjoy the watercourse.



Fig. 23. Map of Tomé, indicating the location of the Vertical community garden.



MP-CH-02 Pottery workshop, Quinchamalí (type A): This initiative is a versatile space where alfareras (craft women who make clay pots) can perform cooking tasks under a structure that protects them from high temperatures and rains, while also helping them connect to the territory. The prototype was designed to respond to the potters' needs. These had been identified through a workshop that explored the potters' daily field tasks in the field. The structure helps promote tourism, while responding to a series of requirements and practices identified through structured dialogue with the community. It is proposed as a flexible and replicable model, with the idea of creating a network of craft workshops that can become a path of patrimonial interest, making the ancient knowledge and traditions of local women more visible to visitors.



Fig. 24. Map of Quinchamalí, indicating the location of the MP-CH-02 Pottery Workshop.

MP-CH-03 Natural mitigation and irrigation barrier (type A):

This natural barrier is conceived to reinforce the community garden initiative and to enhance its link with the estuary. The project seeks to respond to the functional requirements of generating an irrigation system and having a pump to guarantee access to the estuary waters. At the same time, it seeks to transform public spaces, making them more suitable for social and recreational activities. Thanks to the implementation of landscape design and the use of low-lying vegetation, the barrier will become a means of protection and mitigation against the estuary's possible overflow, without affecting the natural runoff of water towards the low-lying sectors.

MP-CH-04 Botanical illustration workshop (type A):

This educational initiative consists of a workshop on drawing and illustration of local flora. Aimed at teenagers and women, it seeks to help participants develop drawing and painting skills as a means of facilitating environmental awareness and disseminating local women's vast knowledge of the distinctive flowers and plants of the Nonguén Forest.

MP-CH-05 Classrooms in natural environments (type B):

This educational initiative creates the infrastructure required to teach school classes outdoors. It includes activities such as constructing furniture and installing communication signs, with appropriate graphics and aesthetics, in the aim of inspiring primary school children to take care of the site and teaching them about the importance of ecosystems. It provides the necessary spaces for conducting outdoor classes on ecology and environmental issues.

MP-CH-06 Forest therapy (type B):

The objective of this initiative is to develop therapeutic activities that are based on contact with nature. It develops Nonguén youth's capacities to lead culturally relevant activities, so that residents and visitors can experience rich contact with local ecosystems. The strategy is a response to the frequent droughts recently experienced in the area and builds on local knowledge about the territory.

MP-CH-07 Plaza Nonguén (type A):

This public space initiative includes the construction of a wood structure that can serve as a meeting point, landscape feature, and sightseeing point in the Araucana region. It aims to facilitate the understanding of natural ecosystems in the area. The project recognizes that people's in-depth understanding of the territory, including its fragility and strengths, is a first step to developing environmental awareness and risk reduction practices.

MP-CH-08 Estuary dome (type A):

The objective of this initiative was to build a dome (a collective space) in the local school, to allow the community to meet and participate in an environmental awareness educational program. The dome acts as a demonstration centre for the management of grey water, rainwater, and waste in a vegetable garden. The initiative fosters the deployment of skills in architecture, construction, and design, while also integrating knowledge about cultural traditions, the territory, and ecology.

MP-CH-09 Water recovery demonstrations (type B): The micro-project is a demonstration centre for the recovery of grey water and rainwater to be used in edible gardens. This initiative seeks to inspire local residents to adopt appropriate water management practices in urban agriculture. The ultimate goal is to contribute to create the conditions to guarantee food security among low-income residents in the territory.

Reflection on ADAPTO's work in Chile

Our work in Chile reveals the role that innovative forms of pedagogy can have in research and implementation in areas of increasing vulnerability. It shows the role that universities can play in change once their capacity for social engagement has been recognized. Furthermore, by mobilizing available materials and appropriate technologies, such as pottery and composting, researchers applied innovative solutions all the while showing respect for the wisdom and knowledge of community leaders. The contributions and results from Chile have been key to inspire original ideas on how to frame approaches to culturally-relevant factors such as local memory, trust, and emotions.



Key lessons from the Chilean initiatives include:

- The flexibility of architecture and infrastructure proposals is key. Developing simple solutions and using prefabricated structures that are easy to assemble and disassemble, can facilitate the replicability of ideas and make solutions easier to adapt to the location or to move them to new areas.
- Trust between stakeholders can be easily eroded, particularly between citizens in informal settings and government. In the case of the vertical garden project, the public authorities did not deliver on their commitment to support the initiative through the provision of water for the initiative. This failure created social tension and caused local residents to lose trust in their local government.
- Trust takes time to build. Political support, constant collaboration over many years, and transparent and committed dialogue between citizens and government officers are necessary to consolidate trust and avoid social tension.
- It is important to empower and give space for community leadership: too much control from institutions can weaken the autonomy, innovation, and creativity of local leaders. Local universities can play a crucial role in creating spaces for: (a) dialogue between citizens and authorities; and (b) the emergence of creativity and innovation through collaborative work between stakeholders.

Work in Yumbo, Colombia: Dealing with the cascading effects of climate change, displacement, violence, and other threats

"With this magic (soccer) ball we can change the lives of many children and teach them how to protect the environment and reduce risks"
Local leader in Yumbo.

The Laboratory for Urban Intervention (LIUR) has been working in Yumbo for more than ten years, taking a variety of action research roles. Recently, lab members have focused on participatory design work in the communities of Las Américas and Panorama. These marginalized urban environments were built mostly through informal processes of occupation by people displaced by civil war and violence in larger cities such as Cali and Buenaventura (see Fig. 25). Many of them are looking for economic opportunities in Yumbo, a key industrial city in the region. In fact, there are more than one thousand companies located in Yumbo; but poverty, and lack of infrastructure and services are common in its multiple informal settlements. In addition to enduring concerns over gang violence, air pollution, and the lack of economic opportunities, the residents of these neighborhoods are facing more frequent heatwaves and droughts, resulting in forest fires and less recurrent but more intense rainfalls. Las Américas and Panorama are built on steep slopes, and the results of erosion and hillside degradation have led to intense flash flooding down the hillside, known as *avenidas torrenciales*, as well as landslides (find more about this case [here](#) and [here](#)).



Fig. 25. Map of Colombia, showing the location of Yumbo, Salgar and key local institutions.

In Yumbo, ADAPTO researchers established a platform for inter-institutional cooperation and contact between the community, government, and the private sector. To this end, they established alliances to facilitate transformations in public spaces and implementation of educational projects financed by the local government and local companies. Education on climate-related challenges has been a key component of transformation in Yumbo. In fact, new initiatives are currently being developed since the implementation of the Municipality's Climate Change Adaptation Plan in collaboration with the Secretary of Education and UMATA. The ADAPTO

team established itself as a source of seed capital, promoting new, community-led collaborative work. Local residents and staff in the Municipal Planning Office recognized that the platform was a management mechanism, driven by a team of academics with neutral interests (in contrast with the high level of clientelism found in other institutions in Yumbo).

Bottom-up initiatives in Yumbo: Dealing with climate effects in contexts of violence and marginalization

The first initiatives involving academic partners were implemented in collaboration with the local neighbourhood committee as well as several local leaders. Those leaders participated in the third seminar in Cuba as well as the local leaders' roundtable organised by Corporación Antioquia Presente. The early initiatives run by ADAPTO in Las Américas and Panorama were challenging (see Figs. 26 and 27). Despite basing its activities on workshops with community members, the LIUR found it difficult to build consensus on a vision for local transformation. For a time, these initiatives reflected the local tensions that exist among stakeholders in informal settings in Yumbo. LIUR focused on other geographic parts of the neighbourhood, where the FACY Foundation (a local NGO created by a community leader) was working on reforestation and nature conservation initiatives and where a sports centre could be built (see Fig. 28).



Fig. 26. Housing and public space in Panorama, Yumbo.

Some locally driven initiatives had a different focus: they aimed to build on existing efforts to reforest the natural area around a water source and remove the solid waste strewn about the area, in view of reducing erosion, lessening the heat-island effect, and improving the poor drainage that was causing flash flooding and landslide risk. As the COVID-19 pandemic forced the community into lockdown, the loss of economic livelihood and the scarcity of affordable food led the community group to focus more on urban agriculture.

The community work led by the Universidad del Valle has been of vital importance for developing bottom-up initiatives in Yumbo. A key component was the involvement of the private sector: notably, companies that are located in the city and that have contributed by sponsoring bottom-up initiatives and providing technical support. However, the COVID-19 crisis slowed down several activities and disrupted the work of both students and leaders. Below is a brief description of each micro-project.



Fig. 27. Community leaders and students working on a micro-project in Yumbo, Colombia, 2018.

MP-CO-01 Sustainable urban drainage system (SUDS) (type A):

This initiative oversees the construction of a SUDS in *Parque Las Américas*. The system is low cost, replicable, easy to build, and involves the community in each stage of the process. The objectives of this initiative are to: (a) involve and train the community in improving the conditions for controlling, filtering, in filtering, and treating rainwater; (b) promote environmental awareness and care among members of the community to mitigate both the causes and consequences of climate change; and (c) strengthen the social fabric of the *Las Américas* neighbourhood by collectively building a system that improves public space. The technology developed in this initiative was registered for intellectual property in Colombia's *Superintendencia de Industria y Comercio* (a regulatory body for patents and property rights).

MP-CO-02 Water management system (type A): This water management system in Yumbo seeks to: (a) foster general knowledge in the community about concepts related to the importance of water management; (b) enable the community to interact with and appropriate these concepts; and (c) promote better water management to ensure the sustainability of other bottom-up initiatives. Like other solutions supported by the LIUR, this solution has been designed to guarantee that the system is replicable and can be easily built by people with limited construction skills, and with locally-available materials, tools, and technology.

MP-CO-03 Community gardens (type A): Many residents of Yumbo suffer from food insecurity, a problem that has been exacerbated by the COVID-19 crisis. Urban gardens support food security and encourage responsible food production and consumption. The objective of this initiative was to generate a space for the community to engage in culturally-relevant food production and to meet, learn about environmental protection, create alternative ways of working with the land, and improve skills regarding climate change action.

The proposal aligns with the guidelines and priorities of the local administration in terms of food security.



Fig. 28. Map of Yumbo indicating the location of bottom-up initiatives supported by ADAPTO.



MP-CO-04 Reforesting Yumbo (type A): Deforestation in Cerro La Estancia and other green areas is a main concern of citizens and local leaders in Panorama and Las Américas. Its main causes are informal urbanization, mining, and exploitative economic activities (such as quarrying). This agroforestry nursery consists of spaces for the germination, growth, and care of trees, fruit, and ornamental plants, until they can be transplanted to Cerro La Estancia. The reforestation initiative will improve living conditions in the area by promoting better air quality, edible vegetation, and watershed recovery.



MP-CO-05 Family garden (type B): Local leaders in Yumbo have recognized alternative food systems as a key response to the risk of food insecurity. Accessing non-processed fresh food is difficult in Las Américas, Panorama, and other informal settings in the city. This initiative is a solid waste management program for urban agriculture and horticulture activities. It seeks to encourage local residents to produce culturally relevant and nutritious food, and serves as a model for other urban agriculture initiatives in the region.

MP-CO-06 Reforesting Guanabitas (type B): This environmental initiative seeks to foster the recovery of the Guanabitas water stream through awareness workshops and reforestation of river shores. It includes reforestation activities as well as education and training. The initiative involves a local NGO, private companies, and citizens. It also includes a social media-based communication plan, in view of spreading environmental awareness among residents.

Reflection of ADAPTO's work in Yumbo

ADAPTO's work in Yumbo highlights the relevance of dealing with social tension, crime and violence while working on climate action in informal settings. The case exemplifies how climate-safe infrastructure design must consider the vernacular use of space and the priorities of citizens in terms of social activities (sport, cultural activities, and social gatherings). At the beginning, it was necessary for academia to have a leading role, as a means of creating trust and establishing proper conditions

for collaboration. More recently, however, the community has taken control of local initiatives and local universities have been able to play a more modest role in managing those initiatives.

The role that ADAPTO played in mobilizing community actors, mediating tensions, and supporting local ideas and initiatives has been challenging and transformative. In Yumbo, extraordinary work has been done to connect local initiatives with companies that have sponsored activities. This case also highlights the importance of co-design and co-management between communities, academia, private companies, and government. Prototyping has proven to be a low-cost alternative to expensive engineering work. Access to tools, management expertise, and technical knowledge can allow communities to get involved in water management, reforestation activities, and urban agriculture, and thus to overcome infrastructure deficiencies and lack of services.

Work in Salgar, Colombia: Understanding climate-related risks after a major tragedy

Salgar is a rural town of roughly 17,000 inhabitants, located in the mountains next to the Barroso River, in the department of Antioquia. The region is known for coffee production (mostly aimed at exports) and a well-organised agricultural industry. Both the Corporación Antioquia Presente and the Universidad Javeriana have been working with this community ever since a 2015 flash flood devastated the town, killed about 100 people, and left and hundreds of homes and businesses destroyed.

During the preparatory seminar in Medellín in 2017, the ADAPTO research team joined the Corporación Antioquia Presente on a field visit to Salgar, to meet members of the community and institutional actors. At that time, Salgar was completing the post-disaster reconstruction process. There were two community initiatives in Salgar, one designed as an incubator for projects aimed at ecosystem adaptation, and another concerned with risk management training. The initiatives were supported by both the Universidad Javeriana and Corporación Antioquia Presente. They respond to the community's need to care for the ecosystems that the residents of Salgar depend on for their food and livelihoods (find more about this case [here](#)).

For more than five years, a young woman leader has been working on environmental initiatives in Salgar. Her work, facilitating networking and coordinating stakeholders in the region, was crucial to the success of the local initiatives. As the initiatives from the incubator were developed, new collaborative leadership roles emerged, increasing the project's impact on community members. The extensive network of organizations created synergies that in turn generated innovative ideas and new partnerships with private companies.

The sharing of expertise and resources permitted to scale-up the community-based initiatives and to impact policy at the municipal and regional levels. As part of the ADAPTO project,

for instance, local leaders lobbied for a municipal agreement to ban the use of single-use plastics. Besides, the local team conducted a study of the municipal development plan and provided recommendations to focus actions within the framework of climate change response.

Bottom-up initiatives in Salgar

Two bottom-up initiatives in Salgar were approved by the scientific committee (see Fig. 29). Their launch coincided with social protests in Colombia and the COVID -19 health crisis. However, thanks to one woman's leadership, the micro-projects succeeded and effectively impacted local policy. On February 2021, this local leader presented the results of the two initiatives at the Solidarity Economy and Climate Change Forum. Below is a brief description of each initiative.



MP-CO-07 Ecosystem adaptation (type B): This initiative seeks to scale-up informal strategies for adaptation to climate change and variability by integrating a network of local productive groups and leaders of water facilities in the municipality of Salgar, with particular emphasis on women. Initiatives focus on agricultural and ecological activities integrating local knowledge about the territory, food production, and water and waste management.

MP-CO-08 Risk management training (type B): The objective of this initiative is to strengthen the Municipal Council for Risk Management and Disaster Attention by training local leaders to act as key actors in risk management networks and in this way, generate collective and more concerted actions in Salgar. The initiative includes dissemination activities through a local radio program focusing on environmental awareness and integrating reflections on climate change action.

Reflection on ADAPTO's work in Salgar

The cases of Salgar and Yumbo highlight the role that private companies can play in disaster risk reduction and post-disaster reconstruction. Private partners often have a long-term vision that can be key in implementation activities and that



Fig. 29. Map of Salgar showing the location of bottom-up initiatives supported by ADAPTO.

is sometimes missing among government officials (who tend to focus on short-term goals linked to electoral interests). In Colombia, entrepreneurs often have the trust of citizens in informal settings and they are recognized as key agents of change. These attributes can be deployed in climate action when properly articulated with the interests and needs of citizens, as well as the actions of governments and NGOs.

In Salgar, the training and interaction spaces provided by ADAPTO boosted action in collaboration between the community, government, and private companies, making it possible to achieve stronger results than via isolated efforts alone. Thanks to the high degree of participation by young people and women in the training and dissemination processes, as well as the field activities, existing capacities and leadership were strengthened in the community. The initiatives created a snowball effect and generated additional proposals that are now being implemented by the private sector and the community. At least three activities will continue after the initiatives supported by ADAPTO have ended. First, local beekeepers, originally supported by ADAPTO through the Ecosystem adaptation initiative, are now engaged in fruit tree planting. Second, the farmers' market that began with the same initiative continues to be held monthly, with the support of different municipal institutions. Finally, leaders will continue training on ecosystem's protection in collaboration with the environmental organization Corantioquia, the School Delfina Calado de Ochoa, and local authorities.

The incubator model for supporting bottom-up initiatives is replicable in other Latin American countries. A model that favours the germination and interconnection between several initiatives has proven effective to participatory ecosystem-based action. An international network of similar incubators in Latin America would allow for a flexible and context-specific response to social and environmental risk, while fostering local leadership.



Fig. 30. Image of a project conducted by Masters students for the Barrio Panorama in Yumbo (Students: Mikhaela Bitton, Kym Byrns, Bernica Joseph, and Pascale Toupin).

D. Training and Capacity Building

"During our training sessions, community leaders were thinking about how to adapt to climate change, but at the same time, they were wondering how to find food for next week."

Elsa Monsalve (ADAPTO trainer), Carahatas, Cuba, 2019.

Corporación Antioquia Presente was in charge of organizing training activities in collaboration with local academic partners in Yumbo, Concepción, and Carahatas. The three training workshops helped to strengthen local capacities to create the conditions for replication and transferability of successful strategies.

Training workshop in Concepción, Chile: The workshop was held for three days in January 2019. The social coordinator of the Corporación Antioquia Presente worked with local leaders of the Nonguén Valley to share social management tools aimed at restoring the quality of life of the communities affected by disasters and climate change (see Fig. 32). Additional information and videos can be found on the workshop's [website](#).

Training workshop in Yumbo-Cali: In April 2019, the Corporación Antioquia Presente and Universidad del Valle conducted a reflective workshop on teamwork and leadership. The development of a diagnosis of implementation barriers helped leaders reflect on common challenges and propose strategies to manage tensions, lack of trust, corruption, and conflict. The workshop also dealt with team motivation and provided methodological and conceptual tools to strengthen climate activism. Additional information and videos can be found on the workshop's [website](#).

Training workshop in Cuba: Training sessions in Cuba focused on risk management, strategies of response to climate change effects, and tools to promote teamwork and leadership, especially among women (see Fig. 31). These activities aimed to strengthen local capacities and create the conditions to

generate better awareness of, and responses to, the effects of global warming. The training process took place in November 2019, in association with the Universidad Central Marta Abreu de Las Villas. Additional information and videos can be found on the workshop's [website](#).



Fig. 31. Structured dialogue with local leaders in Carahatas, Cuba.



Fig. 32. Training workshop in Concepción, Chile, 2019.

E. Dissemination and Influence

Early on we identified that lessons learned in informal settlements were often insufficiently disseminated, and adaptive strategies developed in informal settings were often ignored or misunderstood. We also found that several implementation challenges, and misunderstanding about disaster root causes, were common in several countries and regions. In response, one of the key objectives of the dissemination plan was to achieve South-South communication and knowledge exchange.

Through a series of participatory activities and communication strategies, we addressed common misconceptions about risk and disasters and explored ideas to eliminate root causes of disaster. In each location, ADAPTO supported meaningful dialogue among public officers, community leaders (notably women leaders), local students, and representatives from institutions engaged with disaster risk reduction.

We emphasized the dissemination of scientific results among citizens and non-academic stakeholders, notably through workshops, presentations, construction manuals, radio programs, policy briefs, websites, videos, participation in media, non-academic forums, and podcasts, as well as a strong social media dissemination plan. Most local communications were carried out in Spanish, and international dissemination was mostly conducted in French and English through our different platforms.

Results include the participation of team members in 18 academic presentations, 15 presentations to non-academic partners, 11 press articles, 4 radio interviews, and several podcasts. We also achieved the publication of 11 policy briefs and the dissemination of 20 videos. Through this work, we have influenced 15 policy and strategic documents on disaster risk reduction, environmental action, and climate change response in four countries. Results have also been published in 2 books, 2 book chapters; 13 international journal articles, and a further 2 papers are in preparation for submission. Student projects were posted on the website architectureethique.com (see Fig. 32 and the following links: 2017 projects in Carahatas [here](#), 2018 projects in Yumbo [here](#); 2019 projects in Santa Clara [here](#); 2020 projects in Caibarién [here](#)).

Results published in two books

Lizarralde, Gonzalo (2021). *Unnatural Disasters: Why most responses to risk and climate change fail but some succeed*. New York: Columbia University Press.

Lopez, Adriana (2021). *Urbaniños: Una aproximación interactiva para involucrar a la población infantil en procesos de intervención del espacio urbano*. Cali: Universidad del Valle.

Eleven Policy Briefs

Propuesta de incidencia para el plan de Desarrollo de Salgar 2020-2030

Lineamientos Para la Formulación e Implementación de

Políticas Públicas Municipales de Gestión y Adaptabilidad para el Cambio Climático. Municipio de Yumbo, Colombia.

Beyond Mainstreaming Climate Change Adaptation in Policy and Plans: Anchoring on Local Traditions and Existing Initiatives to Enable Adaptation.

Opportunities and Challenges of Urban Planning and Climate Risk Management in Informal Settings: Considering Dwellers Multidimensional Wellbeing.

Peri-Urban Spaces: From Technical Solutions to Multi-level Governance.

To Act on Climate, Empower Woman: Supporting Women in Leading Climate Change Adaptation in Informal Settings.

Sustaining Momentum: Project Implementation and Climate Change Adaptation.

Turning the Tide: Climate Change, Emotions, and Policy.

Acknowledging community risk perception in DRR policies in Latin America: Three key lessons.

Socio-cultural and traditional activities to build trust and overcome barriers among stakeholders: lessons from the Latin American informal context.

Striking a Balance to Build Capacity: How Academia Can Support Climate Action in Informal Settings.

Three Construction Guidelines

Three construction guidelines (Cartillas de auto-construcción) were published by Universidad del Valle after the experience in Yumbo:

Manual de usuario. Gradería SUDS. Instrucciones de ensamble. Find the document [here](#).

Manual de usuario. Tanque de tormenta. Instrucciones de ensamble. Find the document [here](#).

Manual de usuario. Sendero Zanja Litrante. Instrucciones de ensamble. Find the document [here](#).

These Do-It-Yourself manuals are the direct result of micro-projects conducted in close collaboration with students in architecture, urban design, engineering, and industrial design, as well as with local leaders, residents, and private partners in Yumbo. They synthesize new knowledge and creative work in disaster-risk management, urban design, construction, architecture, industrial design, and communications.

The low-cost, low-tech solutions presented in these guidelines contribute to manage rainwater, keeping the soil stable, and reducing the risk of floods, landslides, rockslides, and erosion. The guidelines are written in plain language and illustrated in a way that unskilled residents can use them to build basic solutions to mitigate risk in sloped areas. The technical solutions presented in the handbooks have obtained an intellectual property registry by Colombian authorities. This

intellectual property registration means that private companies can't commercialize the solution for profit, keeping it available to communities, NGOs, non-profit organizations, and informal construction companies. Given that the intellectual property belongs to Universidad del Valle, the knowledge is available to everyone, the documents are open-access, and the solutions can be rapidly built to create disaster-risk reduction initiatives in other places (without expensive and cumbersome permissions from manufacturers).

Thirteen Journal Articles

Lizarralde, G., Bornstein, L., Herazo, B., Burdiles, R., Araneda, C., Páez, H., Díaz, J. H., Fauveaud, G., Olivera, A., González, G., López, O., & López, A. (2021). 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*, Submission.

Díaz, J. H., Páez, H., Lizarralde, G., & Herazo, B. (2021). La influencia de la alianza social en la legitimación de la reconstrucción post-desastre. *Letras Verdes FLACSO*, Submission.

Lizarralde, G., Bornstein, L., Robertson, M., Gould, K., Herazo, B., Petter, A.-M., Páez, H., Díaz, J. H., Olivera, A., González, G., López, O., López, A., Ascuí, H., Burdiles, R., & Bouchereau, K. (2021). Does climate change cause disasters? How citizens, academics, and leaders explain climate-related risk and disasters in Latin America and the Caribbean. *International Journal of Disaster Risk Reduction*, 58, 102173. Open access [here](#).

González Camacho, G., Olivera Ranero, A., Pando Echemendía, D., Castro Castelo, R. J., & Martínez Nodarse, G. M. (2020). El desafío de la gestión del riesgo de desastre en la sostenibilidad de asentamientos costeros. *Revista científica de Arquitectura y Urbanismo*, 41(2), 5-12. Open access [here](#).

Lizarralde, G., Páez, H., López, A., López, O., Herazo, B., Bornstein, L., & Gould, K. A. (2020). We said, they said: Disconnected narratives in disaster risk reduction in Colombia. *Disaster Prevention and Management*, 30(4). Open access [here](#).

Aragón, E., Lizarralde, G., González, G., Olivera, A., Bornstein, L., Herazo, B., & Labbé, D. (2020). The language of risk and the risk of language: Social struggles in coastal communities in Cuba. *International Journal of Disaster Risk Reduction*, 50(101712). Open access [here](#).

Petter, A.-M., Labbé, D., Lizarralde, G., & Goulet, J. (2020). City profile: Canaan, Haiti - A new post disaster city. *Cities*, 104(102805). Open access [here](#).

López-Valencia, A. P. (2019). Vulnerability assessment in urban areas exposed to flood risk: methodology to explore green infrastructure benefits in a simulation scenario involving the Cañaveralero River in Cali, Colombia. *Natural Hazards*, 99(1), 217-245. Open access [here](#).

Muñoz, L., Páez, H., Lizarralde, G., Labbé, D., & Herazo, B. (2019). Adaptation to Water Scarcity— Water Management Strategies Led by Women on the Caribbean Island of San Andres. *Trialog 134. A Journal for Planning and Building in a Global Context*, 3, 14-18. Available [here](#).

Páez, H., Díaz, J., Lizarralde, G., Labbé, D., & Herazo, B. (2019). Coping with Disasters in Small Municipalities – Women's Role in the Reconstruction of Salgar, Colombia. *Trialog 134. A Journal for Planning and Building in a Global Context*, 3, 9-13. Available [here](#).

Saavedra, J., Rubio Carrasco, C., Valenzuela Contreras, K., & Balboa Jiménez, V. (2019). Memoria local y afrontamiento de desastres climáticos: el caso de liderazgos de mujeres en Nonguén. *Región y Sociedad* 31. Open access [here](#).

Bisbal-Grandal, I., Araneda-Gutiérrez, C., Reyes-Pérez, S., & Saravia-Cortés, F. (2018). El microproyecto como vínculo con el medio e integración de saberes en arquitectura. *Proceedings in Journal format of the JIDA18. V Jornadas de Innovación Docente en Arquitectura*. EINA-UNIZAR, Zaragoza, España. Proceedings available [here](#).

León Aravena, J., Saravia Cortés, F., & Bisbal, I. (2018). Desafíos para la gobernanza en espacios periurbanos metropolitanizados: El caso de Nonguén, en Concepción, Chile. *Revista Pensamiento y Acción Interdisciplinaria*, 4(2), 24-43. Open access [here](#).

Book Chapters

Lizarralde, G., Páez, H., & Herazo, B. (2021). Imported Project Management Practices in Developing Countries: The problem of insufficient adaptation to local project governance systems in the construction sector. In G. Ofori (Ed.), *Building a Body of Knowledge in Project Management in Developing Countries*: In press.

Lizarralde, G. (2021). Introduction: Investing in Disaster Risk Consultants and Visibility. In *Investing in Disaster Risk Reduction for Resilience: Methods, Design and Knowledge under Climate Change*, edited by Nuno Martins, Gonzalo Lizarralde, José Mendes, Pedro Pinto Santos and Teminope Eghleham. New York: Elsevier, 2021.

Op-ed article

Lizarralde, Gonzalo et al., (2021). Peyi Lòk: catástrofes, desastres invisibles y estallido social en Latinoamérica y el Caribe. La Silla Llena. Bogotá; La Silla vacía. Available [here](#).

Video Clips

Video clips played an important role in the dissemination and transmission of knowledge among nonacademic stakeholders. We created three types of video clips: (a) interviews with key stakeholders; (b) short personal stories that convey a specific experience and conclude with a link to the full document; and (c) video summaries of the activities carried out by the different ADAPTO teams. Find in attachment 4 the links to the most relevant videos.



Fig. 33. A housing project for San Clara, Cuba (Students: Audrey-Anne Belleau, Raphaëlle Leclerc, and Léa Aguilera).

Online publication *Artefacts of Disaster Risk Reduction*

We created a unique online open access database of bottom-up disaster-risk reduction action in Latin America and the Caribbean, which includes reports of 22 initiatives supported by ADAPTO. This is perhaps the most comprehensive database of informally driven responses to global warming in the region and we expect it to become a key reference in disaster

studies and practice. Contrary to many other publications in the field, *Artefacts of Disaster-Risk Reduction* focuses not on general objectives and institutions goals, but on effective challenges and opportunities that emerge during on-the-ground implementation in informal settings. In this way, the publication challenges common perceptions about informality and invites readers to understand the possibilities of change that emerge from local agency in parallel, or sometimes in the absence, of State intervention. Find the publication [here](#).

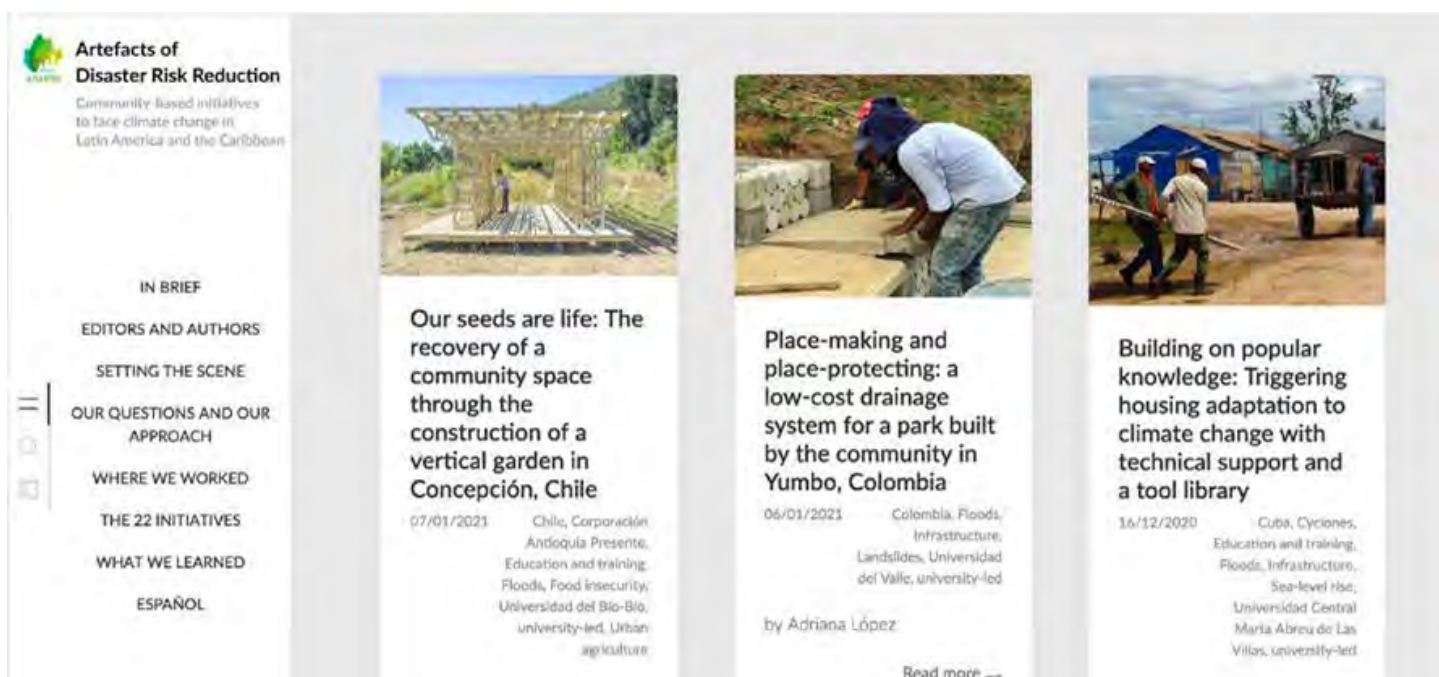


Fig. 34. Online publication *Artefacts of Disaster Risk Reduction*.

5. Social Development and Mid-term Outcomes

At the beginning of the project, we identified common barriers to change (including corruption, red-tape, lack of trust, language barriers, and communication challenges) and possible solutions to overcome them. Over four years, we implemented training activities and conducted a series of meetings and workshops with stakeholders to try to eliminate those barriers and find ways to implement solutions. In our approach, however, the learning process, social interactions, and human experiences are as important as quantifiable outcomes. We therefore documented change in:

Academia; notably in courses, papers, conferences, events, new academic projects (see Fig. 33), and dissemination outputs;

The relationships between human systems and the built environment, through 22 standardised reports of bottom-up initiatives (see Fig. 35);

Policy; notably changes in documents, strategic plans, regulations, and reports; and,

Governance mechanisms; in particular, by identifying new events, procedures, and protocols.



Community leaders meeting in Yumbo, Colombia.



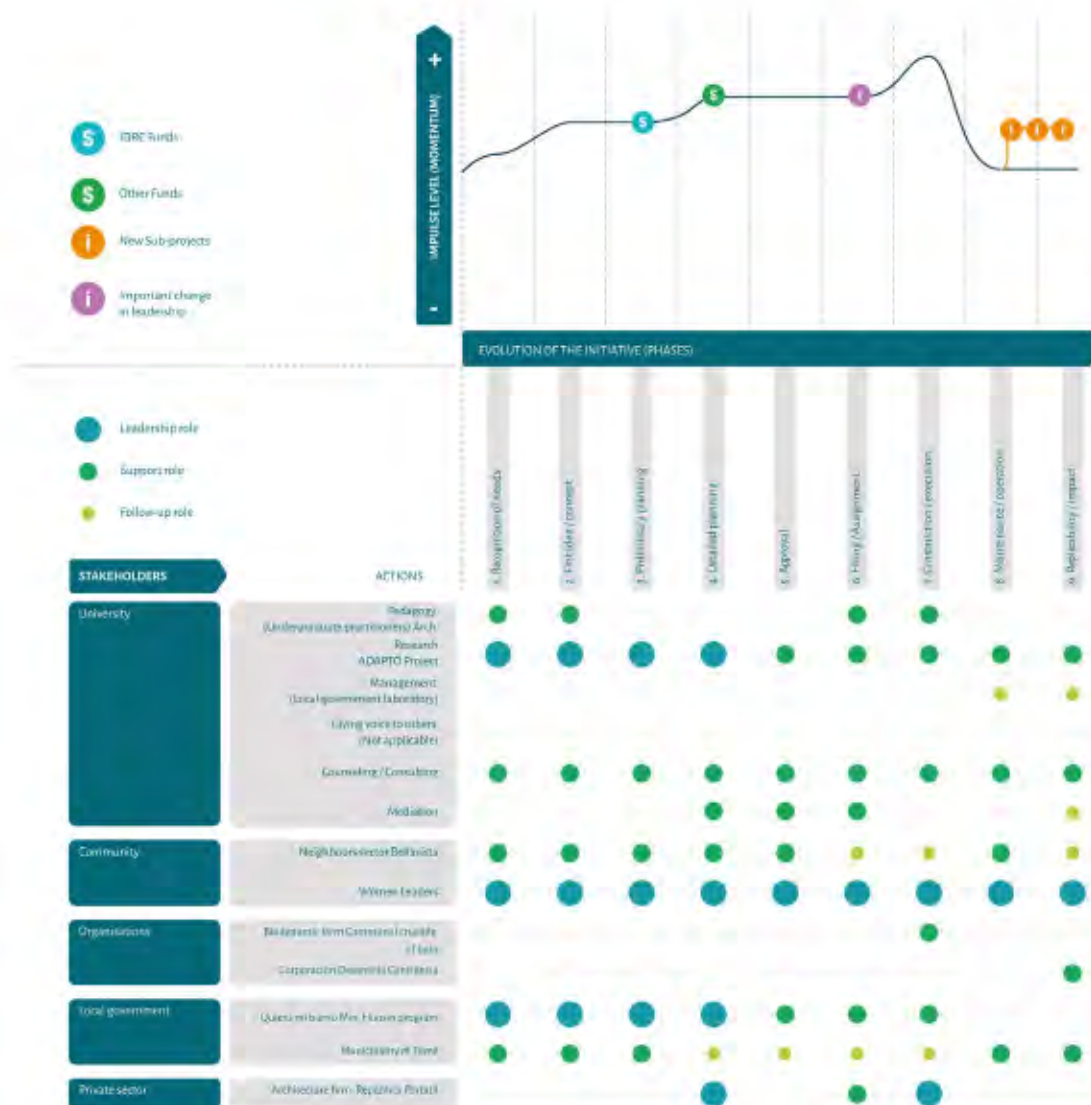


Fig. 35. Example of models used to analyze changes in bottom-up initiatives

Scaling impact in ADAPTO

Annex 4 summarizes the most important results in each of the five plans. In order to increase impact, we adopted five approaches typically considered in international development projects:

1. **Horizontal scaling-up**, which corresponded to “geographical spread to cover more people and communities [...] and involve[d] expansion within the same sector or stakeholder group.”
2. **Vertical scaling up**, which was “institutional in nature and involve[d] other sectors or stakeholder groups.” [78].
3. **Scaling out**, where impact remained at the same level of decision-making but occurred in new communities or social groups [see, for instance: 79].
4. **Scaling in**, where all bottom-up initiatives were reinforced without necessarily increasing impact among other stakeholders—for instance, by empowering a group of leaders without increasing the number of them.

5. **Vertical scaling-up** in planning, where we influenced not only higher spheres of government but also more strategic planning tools, reaching increasing geographic coverage and larger timeframes.

In all places, we found opportunities to amplify, expand, consolidate, and adapt pertinent initiatives. The pertinence of each scaling action, however, was measured against a “filter” of ethical principles, where we paid attention to issues of equity, pertinence, and governance [see, for instance: 80, 81]. Scaling impact in ADAPTO was a matter of social responsibility towards results [81]. By adopting the approach of Gargani & McLean [81, 82], we aimed not to “scale what works,” but to scale impact that serves the public good. We were not looking to “maximize” impact, but to guarantee that change corresponded to the needs and expectations of our partners and local leaders.

Following this ethical principles we wanted “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” [83]. We adopted the framework proposed by McLean & Gargani to contend that scaling is not a management issue but—above anything—an ethical one.

Table 8 shows the main stakeholders that have been impacted through our implementation plan. They will also be the targets of our nine policy and practice briefs, to be released in August 2021.

Location	Stakeholders
Yumbo, Colombia	Municipality CIDEA Regional Risk Unit, CVC <i>Junta de acción comunal</i> Eight key private companies located in Yumbo Ten local small or medium companies located in the implementation neighborhoods Unidad municipal de asistencia técnica – UMATA Instituto municipal de deporte y recreación de Yumbo (IMDERTY) INNOVA NGO FACY Fundación empresarial para el Desarrollo de Yumbo (FEDY)
Salgar, Colombia	Municipality Regional Risk Unit, CAR <i>Junta de acción comunal</i> Municipal coalition for the revision of use of plastic products Fundación CFA <i>Cooperativa de ca cultores de Salgar</i>
Carahatas, Cuba	Municipality CITMA Habitat II Project funded by the Swiss Cooperaton Agency <i>Cooperativa local de pescadores</i> <i>Grupo Gestor Municipal para la implementación de la political nacional de adaptación</i>
Concepción, Chile	Municipality National Program <i>Quiero mi Barrio</i> ; Housing and Urban Development Service (SERVIU) Ministry of Housing <i>Juntas de vecinos en el sector Nonguéen</i>
Canaan, Haiti	<i>Tables de quartier</i> <i>Comité interministériel d'aménagement du territoire (CIAT)</i> <i>Unité de Construction des Logement et des Bâtiments Publics (UCLBP)</i> American Red Cross

Table 8. Main stakeholders in luenced by ADAPTO

ADAPTO could not have been possible without the local counterpart funds and the contribution of our partners and institutions. This was a collaborative project where both community and institutions contributed with funding and in-kind resources. The counterpart funding refers here to all the additional resources provided by communities, local organizations, partnering universities, and NGOs. There are two main groups of contributions: those made available by

the participating institutions and those invested by local communities for the execution of their micro-projects. For the full project period these contributions were CAN\$; 848,354 that is, about 74% of the funding provided by IDRC.

Canadian universities that are part of the Œuvre Durable team have provided about CAN\$ 300,000 during the four years of the project (notably researchers salaries and travel expenses provided by the universities). Besides, all bottom-up initiatives generated interest and were supported by other partners and organizations. We estimate that each bottom-up initiative received about CAN\$ 3,000 of in-kind contributions (including the salary of government and NGO representatives, support provided by Corporación Antioquia Presente and other NGOs, communication material and activities, and administrative support by partnering organizations). For implementation activities alone, we estimate therefore a contribution of about CAN\$ 66,000 by additional stakeholders. Additionally, some bottom—up initiatives received direct contributions in construction materials, transportation, labor, equipment, and supplies for a total of CAN\$ 71,912. Table 9 summarizes the contributions to bottom-up initiatives.



	Code	Bottom-up initiative	Contributing partner	Direct (DRC funding)	In-kind and indirect contributions ^a	Other specific contributions ^b	Observations about other direct contributions
Cuba, U. Central	MP-CU-01	Resilient housing through community self-management	Habitat II Project	\$4,000	\$3,000	\$2,150	Building tools
	MP-CU-02	Community group Mujeres del Mar (Women of the Sea)	Habitat II Project (Swiss Agency)	\$4,000	\$3,000	\$240	Transportation
	MP-CU-03	Circle of Interest Yo me adapto	Habitat II Project (Swiss Agency)	\$4,000	\$3,000	\$388	Computer
	MP-CU-04	Coastal marine festival	Habitat II Project (Swiss Agency)	\$4,000	\$3,000	\$380	Transportation
	MP-CU-05	Community social networking group Voces de Carahatas	Habitat II Project (Swiss Agency)	\$4,000	\$3,000	\$240	Transportation
Concepción, Chile, U. Bio-Bio	MP-CH-01	Vertical community garden	Quiero Mi Barrio	\$4,000	\$3,000	\$8,500	Money for labor and materials
	MP-CH-02	Pottery workshop	Servicio de Vivienda y Urbanismo	\$4,000	\$3,000	\$45,352	Bidding for construction funds
	MP-CH-03	Natural mitigation and irrigation barrier		\$4,000	\$3,000	-	
	MP-CH-04	Botanical illustration workshop	Reserva Nonguén	\$4,000	\$3,000	\$208	Drawing supplies
	MP-CH-05	Classrooms in natural environments		\$4,000	\$3,000	-	
	MP-CH-06	Forest therapy	Reserva Nonguén	\$4,000	\$3,000	\$208	Workshop supplies
	MP-CH-07	Plaza Nonguén		\$4,000	\$3,000	-	
	MP-CH-08	Estuary dome		\$4,000	\$3,000	-	
	MP-CH-09	Water recovery demonstrations		\$4,000	\$3,000	-	
Cali, Colombia, U. Valle	MP-CO-01	Sustainable urban drainage system (SUDS) (I)	Cementos Argos Yumbo Municipality Yumbo Business Alliance	\$4,000	\$3,000	\$940 \$816 \$170	Construction Materials Legal process Workshops
	MP-CO-01a	Sustainable urban drainage system (SUDS) (II)	Cementos Argos Ecodeck	\$4,000		\$1,150 \$1,350	Construction Materials Construction Materials
	MP-CO-02	Water management system	Yumbo Business Alliance UMATA La Madre Locura Fundación FACY	\$4,000	\$3,000	\$300 \$200 \$100 \$300	Workshops Seeds and planting material Seeds and planting material Workshops
	MP-CO-03	Community gardens	UMATA Fundación FACY Yumbo Business Alliance	\$4,000	\$3,000	\$200 \$100 \$300	Seeds and planting material Workshops Workshops
	MP-CO-04	Reforestation Yumbo	Yumbo Business Alliance	\$4,000	\$3,000	\$1,000	Workshops
	MP-CO-05	Family garden (I)	Yumbo Business Alliance	\$4,000	\$3,000	\$4,000	Workshops
	MP-CO-05a	Family garden (II)	Local leaders	\$4,000		\$1,500	Labor and planting material
	MP-CO-06	Reforestation Guanabitas (I)		\$4,000	\$3,000	-	
	MP-CO-06a	Reforestation Guanabitas (II)		\$4,000			
	MP-CO-07	Ecosystem adaptation	Local NGOs	\$4,000	\$3,000	\$4,000	
	MP-CO-08	Managing the risk	Local NGOs	\$4,000	\$3,000	\$4,000	
TOTAL contributions by additional stakeholders				\$100,000	\$66,000	\$70,912	
^a Figures estimated in CANS							

Table 9. Main contributions by stakeholders to our implementation plan.

What difference did ADAPTO ADAPTO created a platform, a network, and spaces for dialogue in view of producing positive change in informal settings. It established the conditions for scaling up informally driven strategies to deal with climate change risks, in particular those led by women, and for transferring them to other contexts and integrating them in policy.

Annex 5 summarises the main contributions in research, networking and dissemination activities by academic and non-academic partners. Despite all these positive results, it is important to continue conducting action research in informal settings because urban informality is still misunderstood and disconnects between stakeholders, policy and implementation, and theory and practice still persist. While we have achieved effective results in several areas, change has been particularly difficult to obtain in:

- Governance structures, which still perpetuate patterns of exclusion, notably the marginalization of Black individuals, Indigenous communities, LGBT individuals, residents of informal settlements, and women;
- Patriarchal structures, which still replicate patterns

that make low-income women particularly vulnerable to natural hazards and climate-related risks, and that prevent them from assuming more active roles in urban design, politics, and leadership;

- Eliminating policy contradictions and implementation barriers, which continue to make change difficult (even when good intentions are written into policy); and,
- Language used by policy and decision makers, which is still disconnected from the local narratives we found on the ground

Impact on policy and strategic documents

Table 10 shows how the project had an impact on policy documents.

Country and Policy Document	Type of document (area of influence*)	Influence in the approach to:		
		Climate response	Informal settings	Gender/social relationships
Cuba				
Estrategia de Desarrollo Local del Municipio Quemado de Güines. Línea estratégica de reducción de desastres y la adaptación al cambio climático.	Urban and regional planning with emphasis on climate response (NL)	Yes	Yes	Yes
Actualización del Plan General de Ordenamiento de Carahatas.	Urban and regional planning (ML and RL)	Yes	Yes	
Implementación de la "Tarea Vida" en Carahatas. Acuerdo 62/21 del Consejo de la Administración Municipal de Quemado de Güines.	DRR and climate adaptation policy (NL and RL)	Yes	Yes	Yes
Colombia				
Plan de ordenamiento territorial de Yumbo, Colombia (En proceso de revisión y ajuste según Ley 388 del 97)	Urban and regional planning (ML)	Yes	Yes	
Plan de acción de la Unidad municipal de asistencia técnica UMATA, Yumbo, Colombia	Technical strategic plan (ML)	Yes	Yes	
Plan Municipal de adaptación al cambio climático, Yumbo, Colombia.	DRR and climate adaptation policy (ML)	Yes	Yes	
Proyectos Ambientales Escolares PRAES Municipales, Yumbo, Colombia.	Environmental policy and education (ML)	Yes	Yes	
Plan Municipal de Gestión del Riesgo de Desastres	DRR and climate adaptation policy (ML and RL)	Yes	Yes	
Proyectos presentados por Alcaldía para gestión de recursos por Sistema General de Regalías (SGR)	Strategic projects (ML)	Yes	Yes	
Colombia Salgar				
Análisis del plan de desarrollo de Salgar (2020-2023) en el componente ambiental.	Strategic development with emphasis on environmental concerns (ML)	Yes	Yes	Yes
Plan de Ordenamiento territorial de Salgar	Urban and regional planning (ML)	Yes	Yes	
Acuerdo Municipal de prohibición de plásticos de un solo uso e icopor (Acuerdo 005 del 27 de agosto de 2020).	Environmental and waste management policy (ML and RL)	Yes	Yes	Yes
Chile				
Plan de ordenamiento territorial del Gobierno Regional del Bío-Bío	Urban and regional planning (RL)	Yes	Yes	
Programa Quiero mi barrio, Servicio de la vivienda y urbanismo, Chile	Urban upgrading national program (NL)	Yes	Yes	Yes
Programa de habitabilidad rural del Ministerio de la vivienda y urbanismo, Chile	Strategic plan for housing and urban interventions (NL)		Yes	
Plan local de cambio climático, Comuna de Concepción, Chile	DRR and climate adaptation policy (RL and ML)	Yes	Yes	

* Legend or areas of influence: (NL): National Level; (RL): Regional Level; (ML): Municipal Level

Table 10. Analysis of the impact produced in municipal and regional policy

Table 11. Logical Framework mid-term outcomes.

<p>Achieved: Barriers and opportunities to upscale local initiatives and influence climate action and policy were documented and analyzed.</p>	→	<p>Achieved: Local leaders, academics, and policy-makers were brought together, promoting South-South knowledge/ experience/ expertise sharing.</p>	<p>Achieved: Existing and new leaders were identified among students, professors, residents, communities, municipal and government officers, and NGO representatives.</p>	<p>Achieved: Local leaders were empowered and developed new skills to face implementation challenges.</p>	←	<p>Achieved: Professors, decision-makers and students learnt from their counterparts in other countries. Partially achieved: Research results were integrated into policy.</p>
<p>Achieved: Students and academic leaders were given the conditions for generating pertinent knowledge on climate action</p>	to support	<p>Partially achieved: Women play an important role in previously existing and new partnerships in climate action. Explanation: Patriarchal structures still prevent some women from playing a more decisive role in governance structures. More work is still needed in this area.</p>	<p>Achieved: The most promising bottom-up initiatives were identified and supported.</p>	<p>Partially achieved: Local leaders and other stakeholders have found financial resources for their initiatives. Explanation: Some have, but initiatives remain fragile and funding is still scarce. More work is still needed in this area.</p>	to support	<p>Achieved: Leaders and other stakeholders found common ground and got inspired by each others stories.</p>
<p>Achieved: Local curricula in five universities adopted climate change content.</p> <p>Partially achieved: Bottom-up initiatives are now studied in academic programs.</p>		<p>Partially achieved: Governance structures adopted participatory mechanisms allowing informal agents of change to influence action. Explanation: Governance mechanisms still prevent residents in informal settings and some individuals (black residents, indigenous citizens, women, transexual individuals and others) from fair participation. More work is still needed in this area.</p>	<p>Achieved: 22 informally-generated initiatives of change were reinforced and produced positive transformation in their respective contexts.</p>	<p>Partially achieved: Local leaders, community members, and academics participated in DRR committees and other decision-making bodies. Explanation: Some did. However, the composition of committees and decision-making bodies still perpetuates patterns of exclusion. Additional efforts are still required.</p>		<p>Insufficient progress: Debates were held about the changes required in regulations and codes to better integrate informality and women-led initiatives. Explanation: Several debates were held, but little has been done to remove red tape, policy contradictions, and barriers to better integrate solutions that emerge in informal settings.</p>
<p>Local leaders improved their interventions with knowledge generated by the project.</p>		<p>Partially achieved: Planning documents (Planes de ordenamiento territorial, planes de reducción de riesgos, etc.) incorporated practices that had emerged in informal settings. Explanation: Several did, but effective change requires more than good policy. There are still several barriers to implementation and policy contradictions.</p>	<p>Partially achieved: Cities and agencies formulated policies recognizing the potential of the informal sector and women-led initiatives. Explanation: Several did, but effective change requires more than good policy. There are still several barriers in implementation and policy contradictions.</p>	<p>Partially achieved: Stakeholders have created new projects after the IDRC funding is finished. Explanation: Some have. But leadership is still fragile and resources are scarce.</p>		<p>Partially achieved: Non-academic publications and grey literature included results produced by the project. Explanation: Some publication adopted our research results. But more significant changes are required to eliminate contradictions in policy and to eliminate implementation barriers.</p>

Table 11 summarizes the main project outcomes.



Long-term impacts

In 2021, we can already note some changes in policy discourse and strategic plans in Haiti, Colombia, Chile, and Cuba. Climate change is increasingly targeted in official documents, and its links with vulnerability factors are acknowledged more and more frequently. More importantly, stakeholders are starting to grasp the complexity of the problems, as well as the tensions and controversies that emerge from actions aimed at reducing risk. However, much work is still needed to give informal settings a more central place in policy and disaster risk reduction action in the region. More efforts are also needed to redress social injustices towards women, Indigenous communities, Black and displaced individuals, refugees (Venezuelan citizens for example), and other vulnerable groups. ADAPTO has shown a path towards achieving these goals in the cities selected

for implementation. The project has shown that common narratives can, and must, be challenged and that alternative methods are necessary to produce the right conditions for change, including trust, legitimacy, collaboration, creativity, and common understanding of problems as well as possible solutions.

Our ten policy and practice briefs will be released in August 2021 in English and Spanish. We hope they will contribute to influencing policy and common practices in the region. It is therefore important to conduct another assessment of change in four or five years to assess whether our recommendations have been implemented. Table 12 shows the progress made in selected metrics and long-term impacts, as we can assess them now.

Table 12. Summary of long-term impacts.



6. Problems and Challenges

Although both men and women participated actively in the reconstruction process, women-led and maintained projects after the disaster. Due to past violence (that has killed thousands of men) and other cultural factors, including generational change, many families in the municipality are now headed by women.

Holmes Pérez et al., (2019).

Recognizing problems and challenges was essential to ensuring that we were respecting our ethical principles and key values. We agree with Westoby et al. [84], 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 [85]. In keeping with this principle, we have reflected on our successes as well as the problems we encountered during the project. We have concluded that we faced seven main problems, which we describe below:

Social unrest in Colombia, Chile, and Haiti

“The problem is not that there are not enough women leaders; the thing is, that in many cases, as men, we find ourselves needing to protect them—literally as human shields”

Local leader in Yumbo, Colombia.

During the project, social unrest erupted in Colombia, Chile, and Haiti (along with other countries in the region). It included peaceful and violent demonstrations, strikes, and administrative paralysis, which affected government institutions, universities (mostly public ones), and most businesses. In all cases, students were directly affected by social tension, and—understandably—manifested anxiety, distress, and difficulty concentrating. As well, local professors found it difficult to retain students and maintain academic activities during the strikes.

To be sure, the social movements behind strikes, riots, and demonstrations, did not have a single voice. Instead, they brought together a variety of claims, sentiments, and frustrations, directed especially at patriarchal structures, discrimination, corruption, neoliberalism, and racism. Citizens and civil society groups also expressed concerns about environmental degradation and climate risks. We recognized that the movements' claims influenced the narratives we were obtaining in informal settings, and therefore, decided to analyze their connections with our analysis of risk creation. We analyzed local explanations of risk [65], as expressed by civil society groups, and compared them with the narratives



adopted by local leaders, decision makers, and academics [86]. In this way, we transformed the problem into a research opportunity. But it is fair to say that the movements caused delays in some project activities and affected the work of local teams and students. In Haiti, Chile, and Colombia, several students affiliated with the project were directly affected (i.e., arrested, harassed, or attacked). Several activities (notably reports) were delayed, and it was difficult to keep teams focused on research and implementation activities. Visits to informal neighbourhoods were difficult or impossible during demonstrations and we had to protect our leaders and students by reducing their public exposure and canceling some fieldwork activities.



The Covid-19 pandemic

The COVID-19 pandemic forced us to adopt a mitigation plan that took three additional months to complete. This, along with subsequent lockdowns in Canada and the research locations, had a significant impact on the development of micro-projects (for instance, concerning the implementation plans), on travelling, and on in-person meetings and workshops that had originally been anticipated in the project proposal. Eleven local initiatives (micro-projects) were significantly affected by the lockdowns and the execution reports took more time to complete than planned. In addition, several activities had to be canceled in 2020 and 2021. These activities include:

- A workshop in Santa Clara, Cuba that was scheduled for March-April 2020;

- Travel for students, research interns, and researchers (including travel scholarships and grants to facilitate researchers mobility);

- A general meeting of partners, researchers, community leaders, and students in Concepción, Chile in 2021; and

- Researchers participation in international conferences.

Canceling these activities offered us an opportunity to allocate resources to other key activities that added value to the project and increased its impact on the region. We developed a Pandemic Mitigation Plan, wherein resources that were not used for travelling were devoted to:

- Reinforcing our scholarship program for students from partnering institutions, which helped boost our partners capacity to retain graduate students and

- attract new talent, and guaranteeing that the climate research agenda will be maintained and reinforced after the project's completion in 2021;

- Organizing an internal workshop to close the project, conduct debriefing sessions, evaluate results, discuss outputs, and reflect on local participants experiences;

- Organizing a public webinar to disseminate the project results and lessons learned, and to influence decision makers; and

- Consolidating our publication plan, as well as finishing the online publication *Artefacts of Disaster Risk Reduction* (2021) (a publication for which we invested in editorial and translation services to guarantee the highest quality).

Several activities in informal settlements were delayed and, much like in the case of the social movements, it was difficult to keep students focused on research and leaders on implementation activities. Team members suffered anxiety and were less productive during the waves of the pandemic. These changes led us to extend the project deadline, to extend the resource pool (as set out by the Pandemic Mitigation Plan detailed above), and to conduct new transfers to partnering institutions.

Stigmatization

This project was conducted in urban areas that are prone to violence and crime, as well as in countries where stigmatization can lead to violence and persecution. It was also conducted during times of political polarization, public health emergency, difficult economic conditions, and social tension.

Of course, we always put safety (of local students, professors, citizens, and leaders) first. We had to be careful not to expose leaders and students in a way that could put them at risk of violence or in a position where they could be stigmatized (as anti-government activists, for instance). When deploying our scaling objectives, we were constantly focused on guaranteeing the security of team members in general and local leaders in particular. We also had to modify activities, such as field visits, to guarantee that they were conducted during safe hours and with participants escorted by key community members. For visits in Yumbo and Siloé, local teams asked for the help of local police and researchers were escorted by security personnel.

It was also important to express political arguments since disaster risk reduction is political. But in contexts of polarization, we tried to refrain from endorsing political parties, or of course, supporting specific political leaders. It was also important to use language in a precise and polite manner, to avoid expressing ideas that could be taken as insults or offenses. Diplomacy, politeness, precision, and nuance in communication proved to be key in avoiding tensions and preventing stigmatization.



Fig. 35. Structured dialogue and a session dealing with trauma in Salgar, Colombia.

Trauma and psychological distress

“Dealing with trauma and psychological distress and recognizing emotions are key components of disaster risk reduction”

Corporación Antioquia Presente

This project was conducted with and for people who have suffered trauma or psychological distress caused by disasters, violence, displacement, and/or crime. It was also conducted with and for people who have historically been marginalized and subject to segregation, racism, elitism, and other forms of direct or indirect violence. Many residents we worked with were affected by COVID-19 or by pandemic measures and lockdowns, were and are suffering from anxiety (due to relocation, eviction, possible violence, etc.), and were and are under constant stress to make ends meet.

These characteristics made it crucial to assume an ethical posture. During several field visits, we invited social workers and psychologists. We partnered with Corporación Antioquia Presente, an NGO with more than 30 years of experience working with victims of violence, displacement, and disasters (see Fig. 35). Officers from this NGO led some debriefing sessions and helped us design activities with community members. They also helped us design spaces for expressing emotions and facilitating healing, including social gatherings, artistic activities, performances, and presentations. Local teams designed activities with leaders and community members; agendas were never imposed on them. When activities and events such as focus groups were suggested, we were careful to obtain clear consent from all participants. Activities were never organized too soon after traumatic events, and we tried to identify the optimal timing to meet disaster survivors; i.e., more than two years after the disasters in Carahas, Concepción, and Salgar, and more than four years after the floods in Yumbo.

In all teams, we included experts from the social sciences (anthropology, sociology, psychology, communications, social geography), who helped us identify social tensions, vulnerabilities, and factors that could increase anxiety and stress. We were also careful not to create expectations that the project could not meet. Before fieldwork, students were trained on how to address citizens and communicate ideas without creating anxiety, expectations, or distress. We also organized debriefing sessions with students, leaders, and community members, during which they could express their feelings and reflect on the activities undertaken. Even though there were several activities where emotions were at play, we also organized debriefing sessions to facilitate detachment and critically reflect on feelings and new ideas. We obtained ethics certificates from each university, as well as one general ethics clearance from Université de Montréal. We respected the commitments made and were careful to explain the conditions of participation to all partners, students, government representatives, and citizens.

All changes made during the project were aligned with the ethical principles that guided our work since the beginning. We discussed changes with several team members, to obtain different points of view and to cover as many risk mitigation ideas as possible. In all cases, changes were explained to the IDRC PO, who provided valuable support and was always empathetic.

In all activities, we endeavoured to neither over-victimize residents nor minimize their claims and suffering. Our aim was to show ultimate respect for their knowledge, value their strengths and capacities, and acknowledge their suffering and constraints. In general, our attitude was about active listening, empathizing, and making sure that our work does no harm. We hope to have achieved these objectives.

“Things we could have done better” in empirical research

There are two areas where, in retrospect, we believe we could have obtained stronger scientific results:

One is **the analysis of relationships between human systems and water**. In the ADAPTO project, we studied various responses to risk and climate change, and explored protection plans in place for people and the built environment from water (risks such as floods, droughts, cyclones, tsunamis, and rising sea levels). We also focused on people's economic and psychological connections with water, including issues of attachment to place, understanding of territories, and connections between landscape and income generation, food security, and livelihoods. We opened the door to new studies on the relationships between global warming and food security, including access to water and water management in food systems. We conducted this analysis in terms of both mechanisms (formal and informal responses) and physical interventions such as transformation in public spaces, parks, water barriers, canals, and vernacular housing solutions. Nonetheless, we missed the opportunity to articulate more systematic patterns in other interfaces between the built environment, human systems, and water. These include: (a) the preservation of water, including measures to protect water sources and link environmental action with water systems; (b) the use of water: patterns in consumption, sanitary systems, and water management; and, (c) the development of infrastructure to guarantee access to clean/potable water (drains, reservoirs, water treatment, and water collection). We did obtain some results in these areas. For example, we obtained empirical data about water management practices in San Andrés and water collection in Carahatas. However, we have not yet articulated patterns in articles or publications that can have a scientific impact. These are aspects that we look forward to reinforcing soon and in future research projects.

The other area is **gender and feminist approaches to DRR and climate change action**. Our implementation work had an emphasis on gender, and we were careful to encourage gender equality in all our actions on the ground. Involvement of women in decision making was always important in our scientific plan, in implementation and networking, and in the dissemination of project results. We placed emphasis on narratives, stories, and interventions by women in our empirical analyses. For our final webinar, we chose to highlight gender and feminist approaches to DRR. Some students explored feminist approaches in our design studios, and we emphasized women's vulnerabilities and strengths in DRR.

However, our theoretical contributions could have developed more sophisticated results in terms of gender dynamics in informal settings and feminist approaches to DRR in urban

settings. We also missed the opportunity to go deeper in terms of patterns of patriarchy that affect DRR in the region. Rather than combining results from different social groups, we could have conducted independent analyses of gender relationships in risk response. We could have better established, for instance, the differences in gender in perceptions, activities, and interventions on the ground. We could also have developed an analytical framework to study gender patterns in bottom-up initiatives and their implementation.

A deeper analysis of feminist approaches to social change and urban transformation is still required in the region. To correct this, we connected with experts of feminism in Argentina, Guatemala, Ecuador, and Colombia, notably at Universidad de Córdoba in Argentina, FLACSO Ecuador, and through GRIPP (the University College London's Gender Responsive Resilience and Intersectionality in Policy and Practice Project, funded by UKRI). But there is still a need to strengthen these relationships and integrate new collaborators in our activities, to provide more emphasis on gender and feminist approaches.

These are all areas that can be developed in future projects and we look forward to addressing them in new research initiatives.



7. Administrative Reflections and Recommendations

The challenges of working in Haiti

Our team has worked in Haiti for 11 years. Nevertheless, work in the country has proven to be very difficult since the beginning of the ADAPTO project. From 2017 to 2019, we were able to conduct empirical research, organize a visit of Haitian partners to Montreal, and complete the case study, and publish pertinent research results about Canaan. After January 2020, however, social unrest in the country made it almost impossible to continue such activities. Haitian academics and students were often interrupted, distracted, and psychologically affected by strikes, demonstrations, and violence. Academic programs were constantly interrupted, logistics were difficult, and management capacity became increasingly fragile. The Université d'État d'Haïti is a valuable partner and its professors are excellent researchers and practitioners. But conducting implementation activities has always been too dangerous.

We encourage IDRC to continue its work in the country nonetheless. We encourage IDRC to keep supporting the Haitian university system, notably through support to the Université d'État d'Haïti and to the Université Quisqueya. The country can benefit from economic support in teaching and research activities. These two universities have top quality researchers, who are capable of leading pertinent academic programs, courses, and research projects. These Haitian professors can also be key players in development projects, working as partners within internationally funded teams. All these activities can have a fundamental contribution to the development of Haiti. But local universities lack technical and administrative resources to achieve long-term research results.

IDRC, with the help of Université de Montréal, McGill University, and other Canadian institutions can make a difference in Haiti. On behalf of *Œuvre Durable* and Université de Montréal we confirm our commitment to keep seeking opportunities for collaboration with Haitian institutions. We confirm our commitment to building mutually beneficial projects and initiatives with the Université d'État d'Haïti, the Université Quisqueya, and key government players such as the CIAT and UCLBP. **If IDRC is willing to work in the country in the future, we can provide academic and logistical support based on our experience.**





The challenge of working with government

Corruption was a significant challenge in Colombia and Haiti. We have trusted partners in all locations and we had excellent relationships with municipal governments in the areas of implementation. But when we wanted to incorporate higher levels of government (regional and national), we noticed that there were corrupt politicians and bureaucrats who could affect our work. We decided to be careful with scaling activities that involved central or regional government agencies. Local academics and partners feared that technocrats and politicians at regional or national levels of government would ask for bribes and attempt to manipulate the ADAPTO project for partisan purposes.

There was also the issue of insufficient attention. During the social unrest and strikes in Haiti, Chile and Colombia, most government officers were busy dealing with the social unrest, and it was difficult to involve them in project activities and scaling action. In other cases (for example, in Salgar), politicians did not see a political value in the local initiatives and ignored them, often postponing meetings with local leaders. A common problem was also the lack of trust that locals have in government. It was therefore challenging to organize activities with local leaders, partners, and citizens that involved more powerful elected officers and technocrats.

It was always crucial to make sure that partners (such as Corporación Antioquia Presente) and universities were not associated with the political parties in government. The political independence of local universities, their ideological “neutrality,” as well as the scientific independence of the team (detached from economic and political interests) were key in implementation. These characteristics also helped establish trust between academics, local leaders, and community members.

In scaling activities, there were also challenges linked to bureaucracy. Small- and medium-sized cities such as Carahatas, Yumbo, Concepción, and Salgar have small structures and

simplified procedures. Quite often, local leaders and academics know politicians and municipal officers by their first names, and they might even know them personally. Scaling action to large cities such as Cali, Havana, Bogotá, and Santiago proved to be more difficult. These larger municipalities and planning offices have complex structures and additional procedures and protocols. Politicians and representatives at higher levels of government are also less accessible and work through bureaucratic intermediaries. Some of the approaches we used in small cities—approaches based on personal trust, direct communication, constant information sharing, and alignment with local values—did not work well when we were attempting to influence central governments and officers in larger cities.



The challenge of assessing impact

In retrospect, we believe we could have assessed changes and impact in a more precise manner had we established a clearer baseline at the beginning of the project. Had we conducted a survey or questionnaire in year 1, we could have assessed changes in year 4, using similar indicators. This could have helped us assess change in, for instance, risk perception, perceptions of informality, opinions about government action, and other variables. In future projects, we will apply instruments in two stages (in the beginning and at the end) to identify areas of impact and facilitate comparisons.

Administrative challenges

Several professors have now indicated that they would have preferred to have had additional exchanges and visits to teams in other countries. Some researchers in Canada would have liked to conduct additional visits and working sessions with Latin American partners, and several Latin American professors would have liked to have had the chance to spend more time in Canadian universities. This demonstrates that cross-learning activities and exchanges between Canadian universities and local institutions in Latin America and the Caribbean are seen positively by all partners. Future projects can perhaps include more funding for this type of exchange.



Given local regulations in Cuba, it was not possible to provide direct stipends or scholarships to students. Due to difficulties caused by the US embargo and regulations of the Cuban Ministry of Education, we decided not to transfer money to the local university (we provided mostly equipment, tools, and administrative support to local initiatives). The embargo also made it difficult to buy equipment in Cuba and there were several challenges in telecommunications (due to poor Internet access and difficulties in finding the right equipment). In response to these challenges we:

- Conducted part of the micro-project management from Montreal;

- Bought equipment abroad and shipped it to Cuba;

- Provided scholarships for Cuban students mobility (so they could travel abroad to participate in internships);

- Partnered with the Swiss-funded project Habitat II, which provided logistical capacity and helped us solve supply chain challenges;

- Supported the Cuban team by providing electronic and communication equipment bought in Canada and in the US and sent to Santa Clara via Miami; and,

- Adapted communication methods with the Cuban team, namely by increasing the use of WhatsApp, phone calls, and text messages.

Delays in money transfers were also a constant challenge.

Each money transfer from Canada to local partners took three to four months. Part of the reason lies in internal regulations at Université de Montréal, lack of communication between the university departments (notably between the research office and the financial department at Université de Montréal) and delays in obtaining authorizations within Université de Montréal and the partnering organizations in Latin America and the Caribbean. To respond to this challenge, we took the following measures:

- We adjusted calendars several times, responding to the administrative delays;

- Local partners borrowed money from other budget resources to be able to respect urgent needs and maintain initial schedules as much as possible; and,

- We established a protocol of transfers that was successfully applied in years 3 and 4.



Colombian law makes it difficult for universities (and public entities in general) to transfer money to citizens. Existing restrictions also make it very difficult to enlist companies without going through a bidding process (to avoid corruption), or to provide scholarships to students without the money being attached to specific outcomes. To respond to these challenges, we had to:

- Split scholarships in two or three instalments;

- Replace some scholarships with student contracts;

- Transfer resources to Corporación Antioquia Presente and use its administrative support to invest in micro-project activities; and,

- Adjust some activity calendars.



The importance of an extended project timeline

We are very glad that IDRC granted us four years to conduct this project (as opposed to the traditional three-year timeline preferred by IDRC). Those four years were essential in establishing trust with new partners and consolidating relationships with the existing partners. A minimum of four years is also required to see changes in urban systems and to be able to evaluate and conduct longitudinal empirical analysis. We consider that similar projects can benefit from this extended timeline.

The advantage of having opportunities for increased policy impact

For the duration of the project, we received excellent support from IDRC to facilitate dissemination and impact among key stakeholders. Our PO connected us with key partners in Peru, India, Montreal, and other places, and facilitated our participation in COP25 as well as other international events. This type of support is not always provided by funding bodies (for instance, Canadian or Quebec funding bodies such as SSHRC and FRQSC). For ADAPTO, having access to these communities of impact (through Canadian embassies and IDRC partners in Canada and abroad) provided added value to the team, reinforced professors' careers, and increased our overall impact.

The importance of having a Canadian coordinator

We celebrate IDRC's choice of funding a team of Latin American professors and universities, while conducting the project through a Canadian team of researchers acting as project coordinators. We find this structure particularly useful and efficient. Throughout the project, we realized that there are significant differences between the North American university/research system and academia in Latin America and the Caribbean. These differences can render collaboration difficult and limit the impact of Canadian institutions. In the ADAPTO project, the Canadian team could breach these differences

and use them as added value to the project, building from differences to improve quality and explore new areas of investigation.

Having *Œuvre Durable* as a project coordinator facilitated management, communication, and exchanges between IDRC and local teams. The Canadian team from *Œuvre Durable* frequently found itself conducting a sort of "translation" between partners, bridging gaps between administrative models and facilitating communication. There was, of course, a need for textual translation of documents, reports, technical forms, and manuscripts (from Spanish to French and English). More important, however, was the constant need to translate between the academic cultures and modes of working of different countries. *Œuvre Durable's* role as translator and mediator was also important to the production of technical and financial reports, to the completion of international dissemination activities, and to the facilitation of exchanges between partners in the region. We believe that *Œuvre Durable's* coordination role can provide several advantages to IDRC initiatives. It certainly provided added value to all ADAPTO partners.

The value of academic freedom in development initiatives

Our team is grateful for the academic freedom granted by IDRC. During the project, we had sufficient autonomy to establish research questions and methods, and to adopt epistemologies and approaches in implementation that aligned with our research objectives. We were able to conduct the project—including implementation and networking objectives—without compromising the highest scientific standards.

There was always constant collaboration, communication, and information exchange with IDRC's project officer (PO). She was willing to accommodate changes and approve adjustments when necessary. The collaborative approach, capacity for adaptation, and the academic freedom granted to us by IDRC were key to navigate uncertainties and in making decisions based on the highest scientific standards and academic rigour.

8. Key Messages and Policy Recommendations

The ADAPTO project has developed five longitudinal case studies and allowed our team to converse and collaborate with individuals and stakeholders who are working to improve living conditions in informal settings. Through the project we were able to provide psychosocial and leadership support to community leaders, implement a series of local initiatives, and analyze and share what we learned.

This section summarizes what we learned in three key messages.

First, explanations and narratives matter – a great deal. Local leaders and community members have novel and important knowledge of the multiple threats they face and the strategies needed to address them. The ways that risk, disaster and climate change are perceived or framed by officers in public institutions, international agencies, and non-governmental organizations help establish the foundations upon which disaster risk reduction work rests.

Our second key message is that governance and institutions must be strengthened. If institutions suffer from corruption and clientelism, or simply inefficiency, lack of local capacity, and poor decision making, a governance vacuum emerges. Strengthening institutions requires developing local capacity among public officers, removing implementation barriers, and improving ways of working that facilitate local creativity over externally driven and pre-determined solutions.

Third, the political drivers of risk must be made explicit and dealt with. This is an ethical imperative for all individuals engaged in dealing with climate change risks and disasters. Trust between government and citizens must be rebuilt and gender inequalities, racism, elitism, and other social injustices must be addressed.

Engaging in respectful emotional discourse—with community leaders, academics, experts, and political leaders—is an essential step in recognizing the human side of risk and disaster reduction and working together to produce effective and positive solutions.

The next step is to mobilize local ethical creativity to build initiatives that can be supported over time, can grow and lead to further innovation, and can impact urban systems, in view of responding to the scale of the climate crisis.



Reconsidering explanations and narratives about risk, disasters, and climate change

Multiplicity of threats: from atmospheric problems, to daily struggles, to social and environmental injustices

It is both difficult and inappropriate to isolate climate change action from other initiatives aimed at improving living conditions in informal settings. Local leaders and citizens in informal settings typically see risk and danger differently than climate experts and government officials. Whereas government and agencies tend to focus on atmospheric and long-term impacts (such as rising sea levels and warming temperatures), leaders and citizens in informal settings often focus on daily struggles, such as food insecurity, crime, violence, and lack of water and infrastructure.

There are also differences in the understanding of risk. Whereas politicians and government officials see climate change as a problem of increased hazards, local leaders and residents see it as a problem that increases their vulnerability. They also tend to view it as a consequence of social and environmental injustices. Bottom-up actions aimed at reducing risk linked to climate change are often embedded within other important initiatives aimed at improving living conditions.

Local perceptions and understanding of risk sometimes challenge (or directly contradict) expert knowledge. But they can also enrich action if considered in policy and programs. As an example, in Carahatas, Cuba, the government initially prioritized a relocation strategy. The community challenged the strategy, preferring to reinforce their houses and only relocate temporarily, during storms.

Finally, the locally driven initiatives targeted social communication through social media platforms and cultural celebration of the Women of the Sea. Today, local authorities have modified their approach and abandoned (or at least postponed) induced relocation of villagers in Carahatas and other coastal communities.

Recommendation: Governments, agencies, and climate experts should make policy and devise programs and projects built on diverse perspectives and understandings of risk. They should incorporate perspectives of risk and daily challenges expressed by community members and explore less common solutions that will more effectively target the needs and desires of those exposed to hazards.

The climate agenda must not be dissociated from a social and political agenda aimed at redressing social and environmental injustices.

Who knows best? The importance of doing away with expert buzzwords and grounding initiatives in emotions and local ideas and practices

Researchers and experts—including those with experience of poverty and exclusion—often rely on their own ideas, biases, and language about risk and vulnerability when intervening in informal settings. Yet the abstract concepts commonly used in disaster studies, such as “adaptation,” “resilience,” “adaptive capacities,” and “sustainability,” rarely correspond to the ideas, expectations, and perceptions of local residents. Local narratives about risk, disasters, and climate change are often grounded in the realities of daily life in informal settings and tend to focus on social and environmental injustices. Local leaders and citizens have deep knowledge of existing risks, available resources, social dynamics, traditions, and activities that have cultural value. Their ideas for change are not based on abstract notions of sustainability, resilience, or adaptation, but on daily practices and emotions. In fact, these local leaders and citizens give importance to a wide range of emotions (that go beyond fear of physical danger) in their activism and when opposing or prioritizing initiatives.

Emotions of pride, awe, anger, and attachment to place play key roles in motivating others to act, establishing trust, and generating conditions for change.

Recommendation: Policy- and decision-makers, experts, and researchers targeting disaster risk reduction in informal settings must avoid abstract buzzwords (e.g., resilience, sustainability, adaptation, adaptive capacities, etc.) and embrace exploratory framings that better engage and mobilize the depth of local residents' knowledge, as well as their emotional responses to risk, activism, as well as climate and environmental injustices.



Building foundations for positive change in informal settings

Good policy is not enough: The challenge of infrastructure deficiencies and regulatory contradictions

Policy documents in the region recognize the importance of safety and access to housing, infrastructure, services, and other indicators of well-being. But existing urban systems and regulatory frameworks have failed to deliver appropriate infrastructure and services in informal settings.

On one hand there is often insufficient access to food, water, sewage, transportation, and education and health facilities.

On the other hand contradictions in policy make it difficult to develop interventions that fill these gaps. For instance, lack of land tenure rights in Haiti makes it difficult to build infrastructure. In Colombia, local entrepreneurs cannot be awarded government contracts due to their informal status.

In all countries, urban agriculture is encouraged by policy, but municipal regulations make its implementation difficult. And red tape complicates implementation in all parts of the region.

Recommendation: Writing good policy is not enough. In order to reduce climate-related risks in informal settings in the region, it is crucial that government at various levels (local, regional and national) addresses implementation problems in services and in infrastructure. Government must also revise policy and regulations to identify contradictions and eliminate red tape and other barriers to positive transformation in informal settings.

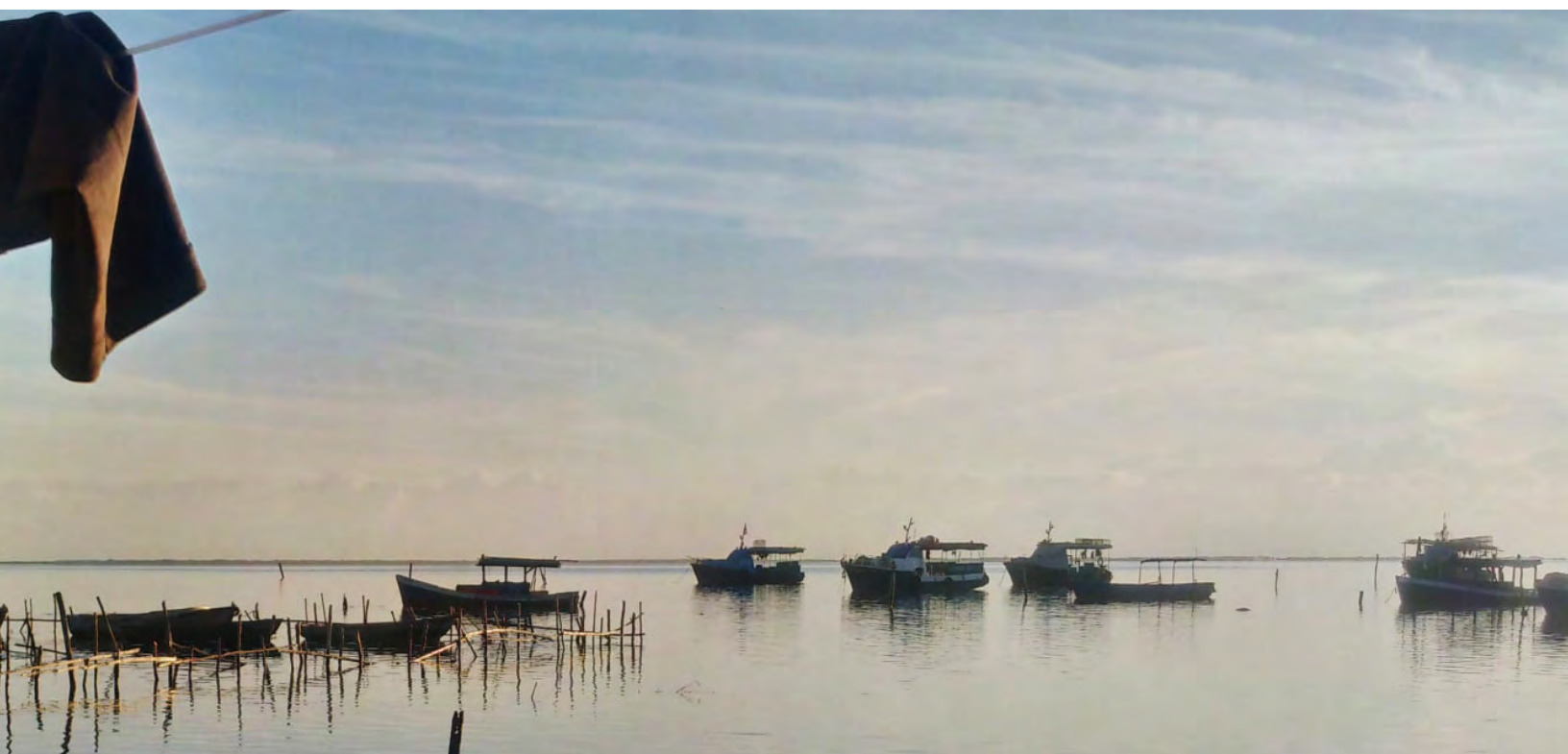
Soccer, dancing, and gardening are climate actions too: The importance of anchoring climate change action in local practices and making novel connections

Local leaders and citizens base their disaster risk reduction activities on local knowledge, rituals, practices, and activities, including sports, cultural celebrations, and artistic and cultural events. Support for such initiatives (e.g., soccer games, dancing events, festivals) can help highlight the value of local knowledge, reduce social and governance tensions, and help legitimize the networks and partnerships that allow for new ideas to emerge.

Local leaders embrace serendipitous and culturally relevant entry points to initiate disaster risk reduction initiatives. They often use existing activities, ingrained practices, and socially valued interests that may not have any obvious links with climate change.

Leaders and residents engage in climate action through the spaces they can access and control, like soccer, urban agriculture, festivals, and gardening. Instead of creating climate change-specific initiatives from scratch, they tend to expand existing practices and activities to include objectives of risk reduction and environmental protection.

Recommendation: A disaster risk reduction and a climate agenda aimed to produce positive transformation in informal settings in Latin America and the Caribbean must allow creative projects to emerge rather than pre-determine what might seem like obvious solutions. In areas that are often ridden by violence, poverty, exclusion, and marginalization, the support of socially and culturally relevant spaces, networks, activities, and events is key to addressing climate risk.



Climate change action is political

The importance of trust: overcoming barriers and establishing common ground between citizens, government, and academia

Corruption, violence, and exclusion from socio-political resources (all rooted in racism, patriarchal structures, elitism, and systemic marginalization) are real obstacles to climate action in informal settings in Latin America and the Caribbean. There is a basic lack of trust between citizens in informal settings and other stakeholders such as government, international agencies, and wealthier businesspeople and citizens.

In this context of social tension, community leaders and their allies spend a lot of time and effort fostering the institutional relationships and networks necessary for mobilizing resources and maintaining people's engagement. Yet, building common ground and effective local planning platforms is possible even in the most difficult contexts. In the ADAPTO project, researchers developed a methodology geared towards establishing and maintaining trust through dialogue, creativity, and respect for ethical principles. In this methodology, universities played a crucial role as intermediaries between citizens and government, and as facilitators of collaboration and dialogue. As a result, emerging initiatives, such as urban gardens and improvements to public space, are producing both physical and social transformation.

Recommendation: State institutions and policy makers hold a core responsibility in creating safe decision-making spaces where engaged, transparent, and respectful dialogue with residents in informal settings is possible.

Local universities can act as intermediaries and facilitators to create common ground and establish trust between government, citizens, and other heterogeneous stakeholders.

The gender paradox: Dealing with gender-based inequality and the importance of leadership by women

Residents in informal settings often have a long history of trauma and psychological distress linked to violence, racial, and gender-based discrimination, poverty, and exclusion. Women are particularly vulnerable to such trauma and distress. They are frequent targets of crime, abuse, and aggression, tend to work in informal activities, and are less likely than men to have social security, insurance, property titles, education, and stable income. As well, women are often the primary caregivers for elderly people and children, and must provide emotional and economic support for their families, all the while struggling through labyrinthine and unwelcoming governance structures. But here is the paradox: women are often the leaders of change in informal settings. They create the social fabric that makes



transformation possible and are often responsible for water, food, environmental protection, and risk reduction. It places where ADAPTO researchers worked, it is fair to say that low-income women shoulder a “triple burden” of domestic work, income generation, and community engagement. The women leaders ADAPTO researchers worked with are not necessarily looking for political careers, nor are they looking to become public figures. They prefer instead to produce change from within their own communities.

Recommendation: Dealing with climate change and social inequalities should not be two different things. Climate actions require support from community leaders, especially women. Many of them can benefit from safety nets, psychosocial support, training, organizational assistance, and social protection. The climate agenda must not be dissociated from initiatives aimed at increasing women's safety and living conditions and from other programs aimed at removing patriarchal structures that perpetuate gender inequalities in Latin America and the Caribbean.

Beyond fear: The role of emotions and attitudes in disaster risk reduction and climate action

Most policy and programs dealing with climate change are based on the notion that people are (or should be) afraid of destruction. But climate change motivates many other emotions that are often underestimated or ignored in policy, programs, and projects. Emotions are a driver of climate activism, decision-making, and leaders' actions in informal settings.

The community leaders with whom ADAPTO researchers worked embraced emotions and used them in different ways and for different reasons: to mobilize others, create awareness, motivate creativity, express claims, establish trust, and challenge legitimacy. Emotions of awe, frustration, happiness,



local problems effectively reflect the needs and interests of others. The capacity to increase impact in informal settings is highly dependent on sustained engagement, attention to detail, legitimacy, and trust between stakeholders. It implies a process that is more analogous to detailed craftsmanship than to mass production, and that is affected by variables that cannot be rapidly transferred to, or replicated in, other contexts.

For most leaders, the process is as important as the final output. In fact, many of their projects outcomes fail to become sustainable over time. Still, leaders value the social impact, civic response, networks, and relationships created during the process. In every project, it is important to celebrate the journey and if possible, the destination. The process of deliberation, collaboration, and reinforcement of social cohesion provides value that can be used for additional interventions and implementation objectives.



pride, and anger also play key roles in environmental protection and risk reduction in conditions of informality.

When using an explicit emotional approach, ADAPTO researchers realized that there is a profound link between the capacity to imagine opportunities for change and professional knowledge. Recognizing this link is key to creating trust and smoothing tense interactions between political, institutional, expert and community actors.

Recommendation: Officers in government, international agencies, and NGOs can benefit from understanding the role of emotions in disaster risk reduction and climate action. Policy and programs should not be based exclusively on the notion that people are, or should be, afraid of certain hazards. They should be designed to recognize that other emotions play in major part in people's reactions to risk and motivate responses such as attachment to place, reluctance to relocate, acceptance of danger, and emphasis on redressing social and environmental injustices.

Recommendation: Government, agency, and NGO officers must frame scaling impact within ethical principles that respect issues of legitimacy, trust, attention to detail, and local characteristics, as well as residents' and local leaders' notions of transferability and replicability.

Scaling informal practices requires challenging traditional notions used in formal interventions in order to make a greater impact.

Forwards, sideways, and upwards: sustaining efforts and resources, sharing experiences, and influencing policy

Traditional notions of scaling impact, replicability, transferability, and project success and failure have a different meaning in informal settlements, and more so in the fast-changing, high-risk context of the climate crisis. By virtue of their informal character, bottom-up initiatives challenge the premises often associated with government action and puzzles some stakeholders who would prefer resources be invested in formal projects. Some community leaders are openly disinterested in replicating or scaling up their initiatives in other communities, or in collaborating with higher levels of government. Others are eager to share and learn experiences, but express doubt as to whether their ways of responding to





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Annex 1 – Details of Scholarships, Internships, and Mobility Grants

Scholarships and internships within the knowledge plan.

KNOWLEDGE PLAN (2017-2021)			
36 MASTER & BAC. SCHOLARSHIPS (A5)			
Student	Profile	Institution of origin	Host Institution
Julian Cárdenas	Masters student in Architecture and Urbanism	U. del Valle, Colombia	Locally developed
Lester Ledesma	Masters student in Architecture and Urbanism	U. del Valle, Colombia	Locally developed
Maria Fernanda Rojas	Student in Civil Engineering	U. Javeriana, Colombia	Locally developed
Roberto Castro	Architecture student	U. Central, Cuba	Universidad del Valle, Colombia
Jesus Romero	Student in Civil Engineering	U. Javeriana, Colombia	Locally developed
Lina Caicedo	Masters student in Integrated Water Resource Management	U. del Valle, Colombia	McGill University, Canada
Giuliano Beltran	Student in Social Work	U. del Bío-Bío, Chile	Locally developed
Gerson Castillo	Student in Social Work	U. del Valle, Colombia	Locally developed
Camilo Villa	Student in Sociology	U. del Valle, Colombia	Locally developed
Natalia Guerrero	Student in Geography	U. del Valle, Colombia	Locally developed
Héctor F. Mayorga	Masters student in Integrated Water Resource Management	U. del Valle, Colombia	Locally developed
Simon Mammone	Masters student in Urban planning	McGill University, Canada	Universidad del Valle, Colombia
Diego Guzman	Masters student in Civil Engineering	U. Javeriana, Colombia	Locally developed
Cassandra Carrasco	Masters in Social Work	U. del Bío-Bío, Chile	Locally developed
Karina Valenzuela	Masters in Social Work	U. del Bío-Bío, Chile	Locally developed
Victor Balboa	Masters in Social Work	U. del Bío-Bío, Chile	Locally developed
Maaz Khan	Masters student in Urban planning	McGill University, Canada	U. Javeriana, COL
Natalia Carrillo	Student in Ecology	U. Javeriana, Colombia	Locally developed
Ana Maria Pachón	Student in Ecology	U. Javeriana, Colombia	Locally developed
Amanda Diaz	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Benjamin Buchner	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Camila Aburto	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Constanza Mellado	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Constanza Rojas	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Francisca Salgado	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Javiera Fuentealba	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Leonardo Cisternas	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Tomas Acuña	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Francisca Inestroza	Student in Architecture	U. del Bío-Bío, Chile	Locally developed
Camilo Villa	Student in Architecture	U. del Valle, Colombia	Locally developed
Paula Andrea Pava	Student in Architecture	U. del Valle, Colombia	Locally developed
Santiago Garcia Marin	Masters in Civil engineering	U. Javeriana, Colombia	Locally developed
Jose Pulido Monsalve	Masters in Civil engineering	U. Javeriana, Colombia	Locally developed
Carlos Vicente Rey	Masters in Conservation	U. Javeriana, Colombia	Locally developed
Maria Paula Salcedo	Masters in Env. Management	U. Javeriana, Colombia	Locally developed
Claudia M. Forero	Masters in Env. Management	U. Javeriana, Colombia	Locally developed

7 PHD AND 2 POST-DOC SCHOLARSHIPS (A2) (2017-2021)			
Student	Pro le	Institution of origin	Host Institution
Gonzalo González	PhD student in Environmental Sciences	Universidad Central, Cuba	Universidad del Valle, Colombia
Brian Borges	PhD student in Environmental Sciences	Universidad Central, Cuba	Locally developed
Ernesto Aragón	PhD student in Architecture	Universidad Central, Cuba	Université de Montréal, Canada
Denisse Schmidt	PhD student in Architecture	Universidad del Bío-Bío, Chile	Locally developed
Nicolas Saéz	PhD student in Architecture	Universidad del Bío-Bío, Chile	Locally developed
Adriana López	Post Doctoral Fellowship (additional grant awarded to the intern)	Universidad del Valle, Colombia	McGill University, Canada
David Smith	Post Doctoral Fellowship	Université de Montréal, Canada	Université de Montréal, Canada
Anne-Marie Petter	PhD student in Environmental Design	Université de Montréal, Canada	Université de Montréal, Canada
Mauro Cusso	PhD student in Environmental Design	Université de Montréal, Canada	Université de Montréal, Canada

6 INTERNSHIPS (A3) (2017-2020)			
Student	Pro le	Institution of origin	Host Institution
Barbara Ojeda	Student in Social Work	Universidad del Bío-Bío, Chile	C. Antioquia Presente
Edwin Segura	PhD student in Environmental Sciences	Universidad del Valle, Colombia	Universidad Central, Cuba
Lina Dorado	Social Worker	Universidad del Valle, Colombia	Universidad del Bío-Bío, Chile
Camila Soto	Architecture student	Universidad del Bío-Bío, Chile	Universidad del Valle, Colombia
Lina Caicedo	Masters student in Integrated Water RM	Universidad del Valle, Colombia	McGill University, Canada
Pedro T. Martinez	PhD student in Architecture	Universidad Central, Cuba	C. Antioquia Presente

14 TRAVEL SCHOLARSHIPS 2018 (A4)			
Student	Pro le	Institution of origin	Host Institution
Daniela Pando	Architecture student	Universidad Central, Cuba	Universidad del Valle, Colombia
Iliam Delgado	Architecture student	Universidad del Bío-Bío, Chile	Universidad del Valle, Colombia
Ste fen Lajoie	PhD student	Université de Montréal, Canada	Universidad del Valle, Colombia
Simon Mammone	Masters student in Urban planning	McGill University, Canada	Universidad del Valle, Colombia
Mathilde Prud homme	Masters student in Urban planning	McGill University, Canada	Universidad del Valle, Colombia
Maaz Khan	Masters student in Urban planning	McGill University, Canada	Universidad del Valle, Colombia
Amy Oliver	Teaching assistant	Université de Montréal, Canada	Universidad del Valle, Colombia
7 students	Mult. undergraduate and graduate students	Universidad del Valle, Colombia	McGill University, Canada

8 TRAVEL SCHOLARSHIPS 2019 (A4)			
Student	Pro le	Institution of origin	Host Institution
Emmanuel Juste	Architecture student	Université d'État d Haïti	Université de Montréal, Canada
Karolina Ramirez	Masters student in Sustainable Development	Universidad del Valle, Colombia	Universidad Central, Cuba
Bernardita Cuadra	Architecture student	Universidad del Bío-Bío, Chile	Universidad Central, Cuba
Ste fen Lajoie	PhD student	Université de Montréal, Canada	Universidad Central, Cuba
Simon Mammone	Masters student in Urban planning	McGill University, Canada	Universidad Central, Cuba
Maria Isabel Vélez	Graphic Design student	Universidad del Valle, Colombia	Universidad Central, Cuba
Nicolette Dent	Masters student in Urban planning	McGill University, Canada	Universidad Central, Cuba
Fernanda Cordova	Teaching assistant	Université de Montréal, Canada	Universidad Central, Cuba

29 FINANCIAL SUPPORT TO PARTICIPATE IN THE WORKSHOP IN CALI, 2018			
Student	Pro le	Institution of origin	Host Institution
15 local students	Atelier Éthique et pratique(s), UdeM	Universidad del Valle, Colombia	Locally developed
14 Canadian students	Atelier Éthique et pratique(s), UdeM	Université de Montréal, Canada	Universidad del Valle, Colombia
3 local teachers	Atelier Éthique et pratique(s), UdeM	Universidad del Valle, Colombia	Locally developed

30 FINANCIAL TO PARTICIPATE IN THE WORKSHOP IN SANTA CLARA, 2019			
Student	Pro le	Institution of origin	Host Institution
11 local students	Atelier Éthique et pratique(s), UdeM	Universidad Central, Cuba	Locally developed
14 students	Atelier Éthique et pratique(s), UdeM	Université de Montréal, Canada	Universidad Central, Cuba
5 local teachers	Atelier Éthique et pratique(s), UdeM	Universidad Central, Cuba	Locally developed

21 FINANCIAL SUPPORT TO PARTICIPATE IN THE VIRTUAL WORKSHOP IN SANTA CLARA, 2020			
Student	Pro le	Institution of origin	Host Institution
15 Canadian students	Atelier Éthique et pratique(s), UdeM	Université de Montréal, Canada	Virtually developed due to the Covid-19 crisis
6 local teachers	Atelier Éthique et pratique(s), UdeM	Universidad Central, Cuba	Virtually developed

VOLUNTARY WORK			
Student	Pro le	Institution of origin	Host Institution
Lisette Muñoz	Master student in Design	Universidad de los Andes	U. Javeriana, Colombia
Maria Isabel Vélez	Student in Graphic Design	Universidad del Valle, Colombia	Université de Montréal, Canada

RESEARCHERS MOBILITY (E4)						
RESEARCHER	INSTITUTION	2016	2017	2018	2019	2020
Oswaldo López	Universidad del Valle	H	PM	H	PM	
Adriana López	Universidad del Valle	H	PM	H	PM	C
Gonzalo Lizarralde	Université de Montréal	PM, C	PM, C	PM, H, C	PM, C	C
Benjamín Herazo	Université de Montréal	PM	PM	PM, H, C	PM	
Danielle Labbé	Université de Montréal			PM, H		
Lisa Bornstein	McGill University		PM		PM	C
Andrés Olivera	Universidad Central		PM	PM, RM, C	H	C
Gonzalo González	Universidad Central	PM	PM		H	
Ernesto Aragón	Universidad Central	PM	PM	PM, RM	H	
Pedro Martínez	Universidad Central		PM		H	
Hernán Ascuí	Universidad Bío-Bío	PM	PM	PM	PM	
Roberto Burdiles	Universidad Bío-Bío		PM	PM	PM	C
Javier León	Universidad Bío-Bío				PM	
Holmes Páez	Universidad Javeriana	PM	PM	PM, C	PM	C
Julia Díaz	Universidad Javeriana			PM	PM	
Nicolas Ortega	Universidad Javeriana		PM			
Marcela Ochoa	Cor. Antioquia Presente				PM	H
Elsa Monsalve	Cor. Antioquia Presente		H	PM, T	PM, T	H,T
Margarita Restrepo	Cor. Antioquia Presente		H	PM		
Gloria Garcia	Cor. Antioquia Presente	PM	H	PM		
Karine Bouchereau	Université de l'État d Haïti		PM	PM, RM	PM	

PM: ADAPTO Project Meeting. **RM:** ADAPTO Research Meeting. **C:** Conferences (Presentations of Project Results). **H:** Event Host. **T:** Training

Annex 2 – Summary of Presentations, Conferences, and Events

Academic presentations

The project and its results have been presented at several conferences such as:

ADAPTO. (2018). Resultados Parciales Proyecto ADAPTO “Adaptación al Cambio Climático en asentamientos informales. Análisis y fortalecimiento de Iniciativas Locales en Latinoamérica y el Caribe”. Paper presented at the Seminario y taller internacional “Conviviendo con el agua: dilemas éticos relacionados con el desarrollo de asentamientos informales amenazados por el cambio climático, Cali, Colombia.

ADAPTO. (2019). Proyecto ADAPTO “Adaptación al Cambio Climático en asentamientos informales. Análisis y fortalecimiento de Iniciativas Locales en Latinoamérica y el Caribe”. Paper presented at the Rol de las universidades en la innovación de los procesos de adaptación del hábitat al cambio climático, Santa Clara, Cuba. <https://www.uclv.edu.cu/seminario-internacional-rol-las-universidades-la-innovacion-los-procesos-adaptacion-del-habitat-al-cambio-climatico/>

ADAPTO-Chile. (2017). Taller de Barrios. Paper presented at the Encuentro de Vinculación con el Medio desarrollado en el Campus Concepción de la Universidad del Bío-Bío, Concepción, Chile.

ADAPTO-Chile. (2017). Taller de Barrios: Una aproximación experiencial al aprendizaje de la arquitectura a través de la creación de una alianza social tripartita. Paper presented at the Cuarto Encuentro de Innovación y Buenas Prácticas Pedagógicas, Concepción, Chile.

Aragón, E., Olivera, A., González, G., Lizarralde, G., & Herazo, B. (2019). The unheard voices of climate change: the narrative of continuity in coastal communities in Cuba. Paper presented at the I-Rec 2019. Disrupting the status quo: Reconstruction, recovery and resisting disaster risk creation, Gainesville, Florida.

Bornstein, L., & Páez, H. (2019). Capacity Building – Knowledge to Action Panel. Paper presented at the United Nations Climate Change Conference COP25, Madrid, Spain. <https://youtu.be/Ds9uVpc22zk>

Burdiles, R., Olivera Ranero, A., & Ochoa, M. (2019). Salud y cambio climático. Proyecto ADAPTO. Paper presented at the Foro internacional: Cambio climático y desafíos en salud 2019, Medellín, Colombia. https://youtu.be/jJza6s1c_tk

Caicedo, L. (2019). Propuesta para el fortalecimiento de estrategias locales de adaptación al cambio climático en el Municipio de Yumbo, Valle del Cauca. Paper presented at the 2o Foro Municipal de adaptación al cambio climático, Yumbo, Colombia.

González Camacho, G. (2017). Resultados ADAPTO. Paper presented at the 1er Seminario – Taller Internacional “Arquitectura y Academia en tiempos de posdesastre, Santa Clara, Cuba.

González Camacho, G., & Olivera Ranero, A. (2017). Propuesta metodológica para el reasentamiento del hábitat en riesgo en Cuba. Paper presented at the IV Congreso Latinoamericano y Caribeño de Ciencias Sociales, Salamanca, Spain.

González Camacho, G., & Olivera Ranero, A. (2018). Adaptación al cambio climático en la recuperación del huracán Irma. Paper presented at the 5o Congreso Internacional Medio Ambiente Construido y Desarrollo Sustentable, Habana, Cuba.

González Camacho, G., & Olivera Ranero, A. (2018). Adaptación al cambio climático en la recuperación del huracán Irma. Estudio de Caso Carahatas. Paper presented at the Convención Internacional de Ordenamiento Territorial y Urbanismo, OTU, Habana, Cuba.

González Camacho, G., & Olivera Ranero, A. (2018). Adaptación ante el cambio climático. Reasentamiento del hábitat en riesgo. Paper presented at the 11o Congreso Internacional de Educación Superior, Habana, Cuba.

Herazo, B., & Lizarralde, G. (2017). Invisible Local Initiatives for Climate Change Adaptation. Paper presented at the World Design Summit, Montréal, Canada.

Lagos, R. (2017). Barrios, patrimonio y gentrificación. Paper presented at the XX Bienal de Arquitectura de Chile “Diálogos imposterables”, Valparaíso, Chile.

León Aravena, J., & Caicedo, L. (2019). Proyecto ADAPTO “Adaptación al Cambio Climático en asentamientos informales. Análisis y fortalecimiento de Iniciativas Locales en Latinoamérica y el Caribe”. Paper presented at the Primera Cumbre Regional de Cambio Climático y Panel Gobiernos locales problemáticas asociadas al cambio climático, Concepción, Chile. <http://noticias.ubiobio.cl/2019/04/04/ubb-participo-en-primera-cumbre-regional-de-cambio-climatico/>

Lizarralde, G. (2017). The invisible houses: Rethinking and designing housing solutions to mitigate disaster risks. Paper presented at the Earthquake Preparedness and Response Workshop, Montréal, Canada.

Lizarralde, G. (2017). Las Casas Invisibles: Pedagogía e Investigación sobre la Vulnerabilidad, la Resiliencia y la Sostenibilidad de las ciudades de Latinoamérica y el Caribe. Paper presented at the Conference of the Americas on International Education (CAEI), Montréal, Canada.

Lizarralde, G. (2017). Las viviendas invisibles: lecciones de América Latina y el Caribe. Paper presented at the Conversatorio - Experiencias de reconstrucción en el Perú y América Latina: lecciones aprendidas, Lima, Perú. <https://www.cies.org.pe/es/actividad/conversatorio-experiencias-de-reconstruccion-en-el-peru-y-america-latina-lecciones>

Lizarralde, G. (2018). Reframing Urban Resilience

Implementation. Paper presented at the 11th International Forum on Urbanism (IFoU) Congress 2018, Barcelona, Spain. https://youtu.be/rZz5Blu_3sk

Lizarralde, G. (2018). Unnatural Disasters: Controversies in Low-Cost Housing and Post-Disaster Reconstruction. Paper presented at the Seminar at the Master of International Cooperation and Sustainable Emergency Architecture program, Barcelona, Spain.

Lizarralde, G., Herazo, B., Labbé, D., Bornstein, L., Lopez, A., Olivera, A., Ascui, H., Paez-Martinez, H. J., Bouchereau, K., & Robertson, M. (2017). Reinforcing bottom-up initiatives for Climate Change Adaptation in Latin America and the Caribbean. Paper presented at the 8th International i-Rec Conference and Student Competition. Reconstruction and recovery for displaced populations and refugees, York University, Toronto, Canada.

López-Bernal, O., & López-Valencia, A. P. (2017). Proyecto ADAPTO. Paper presented at the Encuentro sobre la resiliencia, Yumbo, Colombia.

López-Bernal, O., & López-Valencia, A. P. (2018). Proyecto ADAPTO. Paper presented at the Conversatorio sobre Cambio Climático, Yumbo, Colombia.

Muñoz, L., Páez, H., Lizarralde, G., Labbé, D., & Herazo, B. (2018). Adaptation to Water Scarcity – Water Management Strategies Led by Women on the Caribbean Island of San Andres. Paper presented at the Annual Conference of Dialog Dortmund, Germany.

Páez, H. (2018). ADAPTO Project. Paper presented at the Workshop Disaster Resilience Education Capacity Building in Latin America, Newcastle, Australia.

Páez, H., Díaz, J., Lizarralde, G., Labbé, D., & Herazo, B. (2018). Adaptation to Climate Change and Variability in Informal Settings: The Case of Salgar, Colombia. Conference presented at the Annual Conference of Dialog Dortmund, Germany.

Presentation of the project to non-academic partners

Corporación Antioquia Presente. (2017). Reunión con líderes de barrios relocalizados. Paper presented at the Municipio de Salgar, Salgar, Colombia.

Corporación Antioquia Presente. (2018). Presentación de ADAPTO a la Alcaldía que sirvió para construir la Política Pública de Cambio Climático y los insumos regionales para Colombia. Paper presented at the Alcaldía de Medellín, Medellín, Colombia.

Corporación Antioquia Presente. (2018). Presentación de ADAPTO a la CMGRD donde incide en la formulación e implementación de políticas públicas para la gestión del riesgo. Paper presented at the Comisión Social del Consejo Municipal de Gestión del Riesgo de Desastres de Medellín - CMGRD, Medellín, Colombia.

Corporación Antioquia Presente. (2018). Reunión con Comfama, Celsia, Red Cross, Salvaterra, Mayor of Medellín, Emgesa, Isagen, Group of Students UPB Social, Fundación Tejido Urbano de Argentina and Build Change USA. Paper presented

at the Corporación Antioquia Presente, Salgar, Colombia.

Corporación Antioquia Presente. (2018). Reunión realizada con el Alcalde de Salgar, el Secretario de Gobierno municipal y un delegado del Dapard, Departamento Administrativo para la Prevención y Atención de Desastres de la Gobernación de Antioquia. Paper presented at the Taller de transferencia de conocimientos y experiencias, Medellín, Colombia.

Lizarralde, G. (2017). The invisible houses: Rethinking and designing housing solutions to mitigate disaster risks. Paper presented at the Earthquake Preparedness and Response Workshop, Montréal, Canada.

Lizarralde, G. (2017). Las viviendas invisibles: lecciones de América Latina y el Caribe. Paper presented at the Conversatorio - Experiencias de reconstrucción en el Perú y América Latina: lecciones aprendidas, Lima, Perú. <https://www.cies.org.pe/es/actividad/conversatorio-experiencias-de-reconstruccion-en-el-peru-y-america-latina-lecciones>

Lizarralde, G. (2017). Partial results of the ADAPTO project Paper presented at the European Embassy International Workshop Port-au-Prince, Haiti.

Páez, H. (2018). ADAPTO Project. Paper presented at the Cooperation Network: Disaster Resilience Education Capacity Building in Latin America, funded by the Council on Australia America Relations (COALAR), Newcastle, Australia.

Universidad del Valle. (2017). Reunión con los socios públicos y privados, incluidos los funcionarios de la administración local (Alcaldía de Yumbo y Consejo Municipal), y los representantes de las siguientes empresas Cementos Argos, Smur t-Kappa y Enterprise Alliance. Paper presented at the Alcaldía de Yumbo, Yumbo, Colombia.

Universidad del Valle. (2018). Presentación de propuestas para la ejecución de micro-proyecto urbano en el barrio Las Américas – Conformación Comité Interinstitucional: Cementos Argos, Fundación Smur kappa, La UMATA (Unidad Municipal de Asistencia Técnica Agropecuaria), Planeación Municipal, Infraestructura, IMDERTY (Instituto Municipal de Deporte y Recreación de Yumbo) FEDY (Fundación Empresarial para el Desarrollo de Yumbo) Concejales del Municipio de Yumbo y líderes del Barrio Las Américas. Paper presented at the Consejo Municipal de Yumbo, Yumbo, Colombia.

Universidad del Valle. (2018). Presentación de Proyecto ADAPTO. Paper presented at the Colegio Gabriel Garcia Marquez, Yumbo, Colombia.

Universidad del Valle. (2018). Presentación y asesoría técnica de los microproyectos en la oficina de Planeación Municipal y la Secretaría de Infraestructura de Yumbo. Igualmente, se realizó la gestión de recursos y equipos para la construcción del Parque Las Américas. Paper presented at the Alcaldía de Yumbo, Yumbo, Colombia.

A more detailed list of these activities can be seen in the annexes of each institution.

international webinar

Dealing with climate change and disaster risk in informal settings in Latin America and the Caribbean:

theoretical and practical considerations

June 29 2021 | 9:00 to 12:30

Including the presentation of final results of the ADAPTO project, funded by:



Canada



Dealing with climate change and disaster risk in informal settings in Latin America and the Caribbean



Panelists:

Adriana **Lopez**

Oswaldo **Lopez**

Lisa **Bornstein**

Roberto **Burdiles**

Elsa **Monsalve**

Gonzalo **Gonzalez**

Gonzalo **Lizarralde**

international webinar and presentation of research results from the ADAPTO project

June 29 2012 9:00 to 12h30



Canada

Special guests:

Brigitte **Baptiste**
EAN
Colombia

Roberto **Barrios**
U. of New Orleans
US



Annex 3 – Summary of Activities in the Five Project Plans

		Canada		Cuba	Colombia			Chile	Haiti	Total
	Activity 2017-2021	UdeM	U McGill	U Central	U Valle	Antioquia	Javeriana	U Bio-Bio	UEH	
A	Knowledge Plan									
	Core members involved	2	1	1	2	2	2	2	1	13
	Other professors and lectures	2		3				2		7
	Teaching and research assist. involved	3		2	1		1	1	1	9
	Undergrad theses on climate issues		1	2	3		3	10	1	20
	Master theses on climate issues	2	4		3		3	4		16
	PhD theses on climate issues	2		3	1			1		7
	Potential leaders for scholarships	3	1	3	3			2	1	13
	Potential leaders for internships	1	1	2	1			2	1	8
	Laptops distributed	1		3	2				2	8
B	Partnership Plan									
B1	Participants in workshop in Medellín	2	1	4	2	10	2	2	1	24
B2	Participants in workshop in Cali	16	3	3	16	1	2	3	1	45
B3	Participants in workshop in Santa Clara	18	3	17	5	3	3	4		53
	Environment and health forum			1	1	3		1		6
	Non-academic partners			4	12	5	3	5	3	32
	Government partners			5	8			4	1	18
	Meeting and events with community			15	23			15		53
	Policy documents changed	2		1		1		1	1	6
	Collaboration agreement signed				1			1		2
C	Micro-Project Plan									
	Number of leaders identified			7	11		4	12		34
	Number of bottom-up initiatives identified			6	9		2	9		26
D	Training Plan									
	Course curriculum in arch./ eng.	2		1	1		1	2		7
	Course curriculum in urban planning	2		1	1					4
	Studio curriculum in architecture	2		2	1			1		6
	Studio curriculum in urban planning	1		1	1			1		4
	Members trained in workshops	3		1	4	3	2	3	1	20
E	Dissemination Plan									
	Academic presentations	5		7	4	1	2	5	5	29
	Presentations to partners	2		2	2			3	1	10
	Interviews in media	9		3	8			4	14	38
	Journal articles	3		2	1		2	2		10

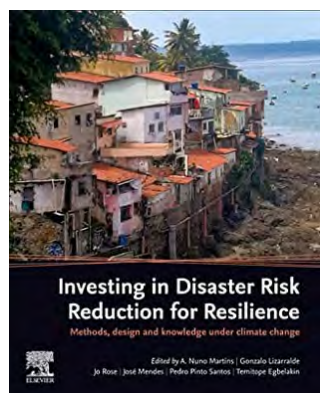
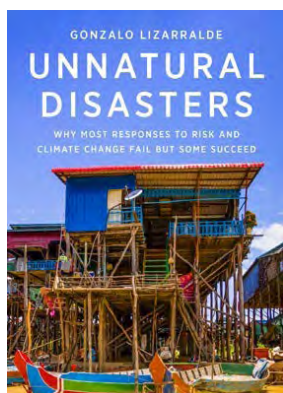
Annex 4 – Summary of Publications and Research Outputs

Click on each image to have a quick access to the following selected outputs :

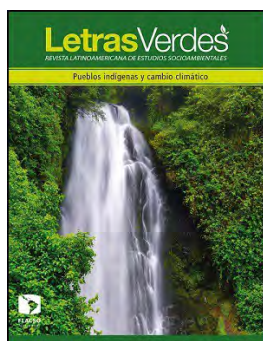
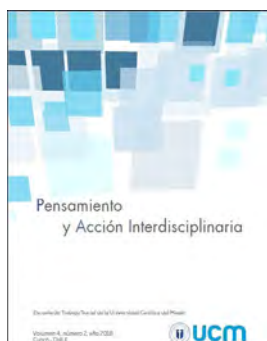
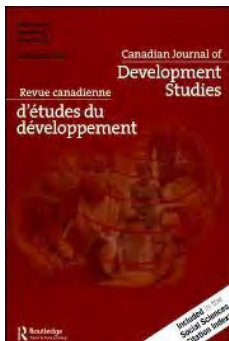
Case studies



Books and book chapters



Journal articles



Video clips

Click on each image to have a quick access to the following selected outputs :

Case studies:



Bottom-up initiatives:



Project results:



Training for local leaders:



Events and conferences:



Manuals and guides



In the Media

The project has been featured in the following interviews:

Le Devoir, July 2017

Journal Forum – nouvelles, May 2017

Radio-Canada International – RCI, May 2017

Gonzalo was interviewed by Caitilin Nordehn, who is leading an international study on gender-related issues. He provided information about results in the ADAPTO project.

Holmes Paéz was interviewed in Javeriana Stereo about the ADAPTO Project and the specific case of Salgar.

Adriana López was interviewed by Caracol Television in Colombia.

Univalle team was interviewed by Telepacífico in Colombia

Œuvre Durable members were very active in social and traditional media (Radio Canada, RDI, La Presse, Forces, etc), discussing key issues about floods in Quebec, Peru, Colombia, Houston, and many other disasters.

ADAPTO Project in UBío-Bío Media. [Click here](#)

ADAPTO Project in web page of Secretaría Regional Ministerial de Vivienda y Urbanismo de la región del Biobío.

Launch of the architecture workshop in 2017. [Click here](#)

Visit of neighbours to Micro-Project presentations December 2017.

Inauguration of Bellavista Community Vertical Garden.

Presentation at the Architecture Biennial of Chile.

Exhibition of Narratives around the lakes in Concepción, September 2017.

Workshop ADAPTO Cali, March 2018. [Click here](#)

Additional funding from IDRC for ADAPTO Project in UdelValle Media. [Click here](#)

International Forum for ADAPTO Project in UdelValle Media. [Click here](#)

Urbaniños initiative as methodology for the Yumbo case in ADAPTO Project in UdelValle Media. [Click here](#)

Radio interview with Professor Adriana López (June 2019): Professor Adriana López from Universidad del Valle was interviewed for the radio program OUR OXYGEN - Actions Against Climate Change.

Disasters: Deconstructed Podcast (September 2019): An open dialogue between Gonzalo Lizarralde, Jason Von Mending and Ksenia Chmutina about the relationships between neoliberalism, vulnerability, informality, and disaster response in Latin America and the Caribbean.

Disasters: Deconstructed Podcast (February 2020): A dialogue between Gonzalo Lizarralde, Jason Von Mending and Lisa Bornstein exploring these questions a) What does resilience mean to you? b) Do you think resilience is a divisive concept or a unifying concept? and c) How can the concept of resilience help us to tell stories about disasters?

Documentary *LAdaptation*, 2020. Produced by Karina Marceau. Montreal. Canada. Intervention by Gonzalo Lizarralde.

Awards

The Cuban student team won the **1st Place in the Cuban Annual Student Scientific Forum 2017** with a submission entitled: “Strategies of Adaptation to Climate Change in The Community of Carahatas”. This team also received a recognition in a regional competition of DRR projects and in the 2017 i-Rec (Information and Research for Reconstruction) international student competition.

The international workshops supported by *Œuvre Durable* since 2012 and by IDRC in 2017 received a Université de Montréal Teaching Award in May 2018.

Professor Olivera received in 2017 the National Habitat Award.

Researcher Andrés Olivera appointed Professor Emeritus at UCLV (March 2020): This honor was awarded to Professor Olivera for “having distinguished himself by his exemplary dedication and for the results obtained in academic activities in higher education, with historical ties to the Universidad Central de las Villas, and for being an example of the trainer of generations of students and professionals and maintaining an active position in defense of ethical principles and values.”

Professor Lizarralde received a mention from the Ministry of Education of Cuba, 2019: The Ministry of Education of Cuba and the Universidad Central Marta Abreu de las Villas granted a special mention to Gonzalo Lizarralde, head of the Fayolle-Magil Construction Chair and Director of the *Œuvre Durable* team. The professor received a tribute for his academic career and his contribution to the struggle for social justice in Cuba and Latin America. This mention was granted by the rector of Universidad Central Marta Abreu de las Villas, Cuba, during the International Scientific Congress 2019, at which Prof. Lizarralde was the keynote speaker.

Honorable mention, “Low-Cost House Design Competition” (July 2020): The ADAPTO Cuba Team was recognized with a Honorable Mention in the international “Low-Cost House Design Competition,” as announced on July 15, 2020 at low-costhouse.com/. The event was organized by the International Architecture Competitions Platform and the ArchDaily portal. The objective was to promote alternative housing solutions, from affordable units with limited size and budget, to meet the urgent demands of social housing.

Annex 5 – References Cited in this Document

1. Satterthwaite, D., et al. Adapting to Climate Change in Urban Areas. Human Settlements Discussion Paper Series, (2007).
2. Parry, M.L., et al. eds. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA., (2007).
3. CRED. The human cost of natural disasters 2015: A global perspective. Brussels: CRED- UNISDR, 2016.
4. UNISDR. Global Assessment Report on Disaster Risk Reduction. Geneva: United Nations Office for Disaster Risk Reduction, 2013.
5. IPCC, . Summary for Policy Makers. , in Climate Change 2014: Impacts, Adaptation and Vulnerability - Contributions of the Working Group II to the Fifth Assessment Report,. p. 1- 32, (2014).
6. Hansen, K. T. Informal Sector, in International Encyclopedia of the Social and Behavioral Sciences, J. Smelser Neil and B. Baltes Paul, Editors. Pergamon: Oxford. p. 7450-7453, (2001).
7. Hernández-García, Jaime. The production of informal urban space: The barrios of Bogota, in Researching the contemporary city: Identity, environment and social inclusion in developing urban areas., Jaime Hernandez-Garcia and Peter Kellett, Editors. Editorial Pontificia Universidad Javeriana: Bogota. p.141-168, (2013).
8. Hussmanns, Ralf. Measuring the informal economy: From employment in the informal sector to informal employment. Integration Working Paper, (2004)(53).
9. Lizarralde, Gonzalo and David Root. The informal construction sector and the inefficiency of low cost housing markets. Construction Management and Economics, (2008). 26(2): p. 103-113.
10. Werna, Edmundo. Shelter, employment and the informal city in the context of the present economic scene: Implications for participatory governance. Habitat International, (2001). 25(2): p. 209-227.
11. Doherty, G. and M. Silva. Formally informal: Daily life and the shock of order in a Brazilian favela. Built Environment, (2011). 37(1): p. 30-41.
12. Durand-Lasserve, Alain and Harris Selod. The Formalization of Urban Land Tenure in Developing Countries, in Urban Land Markets: Improving Land Management for Successful Urbanization, Somik V Lall, et al., Editors. Springer: Washington. p. 101-132, (2009).
13. Choguill, Charles L. The search for policies to support sustainable housing. Habitat International, (2007). 31(1): p. 143-
14. Davis, Mike. Planet of Slums. London: Verso, 2006.
15. Jones, C, WS Hesterly, and SP Borgatti. A general theory of network governance: Exchange conditions and social mechanisms. Academy of Management Review, (1997). 22(4): p. 911- 945.
16. Lizarralde, Gonzalo, et al. The diversity of governance approaches in the face of resilience, in Governance of risk, hazards and disasters: Trends in theory and practice, Giuseppe Forino, Sara Bonati, and Lina M. Calandra, Editors. Routledge: New York, London, (2018).
17. Stiel, B. and J.T. Scholz. eds. Adaptive Governance and Water Conflict: New Institutions for Collaborative Planning. Resources for the Future: Washington, D.C., (2005).
18. Bornstein, Lisa. Introduction to special section on the informal sector. Berkeley Planning Journal, (1992). 7(1): p. 121-123.
19. Anguelovski, Isabelle, et al. Assessing green gentrification in historically disenfranchised neighborhoods: a longitudinal and spatial analysis of Barcelona. Urban Geography, (2018). 39(3): p. 458-491.
20. Anguelovski, Isabelle, et al. Equity Impacts of Urban Land Use Planning for Climate Adaptation: Critical Perspectives from the Global North and South. Journal of Planning Education and Research, (2016). 36(3): p. 333-348.
21. Satterthwaite, David, et al. Building Resilience to Climate Change in Informal Settlements. One Earth, (2020). 2(2): p. 143-156.
22. Mayne, Alan. Slums: The history of a global injustice: Reaktion Books, 2017.
23. Lizarralde, G. The invisible houses: Rethinking and designing low-cost housing in developing countries. London: Routledge, 2014.
24. Kellett, Peter and Jaime Hernandez-Garcia. Researching the contemporary city: Identity, environment and social inclusion in developing urban areas. Bogota: Editorial Pontificia Universidad Javeriana, 2013.
25. Perlman, Janice. Favela: Four decades of living on the edge of Rio de Janeiro. Oxford: Oxford University Press, 2010.
26. Roy, Ananya. Urban Informality: Toward an Epistemology of Planning. Journal of the American Planning Association, (2005). 71(2): p. 147-158.
27. Roy, Ananya Slumdog Cities: Rethinking Subaltern Urbanism. International Journal of Urban and Regional Research, (2011). 35(2): p. 223-238.
28. Cardosi, G., M. Fayazi, and G. Lizarralde. Relationships between Design and Adaptive Capacities in Informal Settlements: The Reconstruction of the Toi Market in Kibera (Nairobi), in 7th i-Rec Conference Proceedings, 2015, Reconstruction and Recovery in Urban Contexts. i-Rec: London, UK2015.
29. Cardosi, G. and G. Lizarralde. Understanding Urban Form and Space Production In Informal Settlements: The Toi Market in Nairobi, Kenya. . in Proceedings of the 25th World Congress of Architecture: Architecture Otherwhere. (2014). Durban, South-Africa: UIA.
30. Choguill, Marisa B. Guaraldo. A ladder of community participation for underdeveloped countries. Habitat International, (1996). 20(3): p. 431-444.

31. Lizarralde, G. *Unnatural Disasters: Why Most Responses to Risk and Climate Change Fail but Some Succeed*. New York: Columbia University Press, 2021.
32. Lizarralde, Gonzalo, Colin Davidson, and Cassidy Johnson. eds. *Rebuilding a ter disasters: From emergency to sustainability*. Taylor & Francis: London, 286 p., (2009).
33. Röhr, U., M. Hemmati, and Y. Lambrou. Towards gender equality in climate change policy: challenges and perspectives for the future, in *Women, gender and disaster*. Sage Publications, Delhi, E. Enarson and P. Dhar Chakrabarti, Editors. SAGE: New Delhi. p. 289- 303, (2009).
34. Latendrese, A and L Bornstein. *Urban Development: Cities and Slums in the Global South*, in *Introduction to International Development: Approaches, Actors and Issues*. Ontario: Oxford University Press, P. Haslam, J. Schafer, and P. Beaudet, Editors. Oxford University Press: Don Mills, (2012).
35. Cutter, S.L., B.J. Boru f, and W.L. Shirley. Social vulnerability to environmental hazards. *Social Science Quarterly*, (2003). 84(2): p. 242-261.
36. Blaikie, P.M., et al. *At risk: natural hazards, peoples vulnerability, and disasters*. New York: Routledge, 1994.
37. Alexander, David. Resilience and disaster risk reduction: An etymological journey. *Natural Hazards and Earth System Sciences Discussions*, (2013). 1(13): p. 2707–2716.
38. Brown, Katrina. *Resilience, Development and Global Change*. New York: Routledge, 2016.
39. Manyena, S.B. The concept of resilience revisited. *Disasters*, (2006). 30(4): p. 434-450.
40. World Health Organization. *Gender, climate change and health*. Geneva: World Health Organization, 2014.
41. Aguilar, Lorena. Women and climate change: Vulnerabilities and adaptive capacities, in *State of the World 2009: Into a Warming World*, Linda Starke, Editor Worldwatch Institute: New York. p. 59-62, (2009).
42. Chant, Sylvia. Cities through a “gender lens”: a golden “urban age” for women in the global South? *Environment and Urbanization*, (2013). 25(1): p. 1-21.
43. Global Weather and Climate Alliance, WEDO, and Energia. *Factsheet: Exposing Gender Gaps in Financing Climate Change Mitigation – and Proposing Solutions*. (2016).
44. Alston, Margaret. Gender mainstreaming and climate change. *Women s Studies International Forum*, (2014). 47, Part B: p. 287-294.
45. Kratzer, S. and V. Le Masson. 10 things to know: Gender equality and achieving climate goals, CDKN Climate & Development Knowledge Network: London2016.
46. Habitat, UN. *State of the worlds cities 2012/2013: Prosperity of cities*: Routledge, 2013.
47. UN-Habitat. *Gender and Urban Planning: issues and trends*. Nairobi: United Nations Human Settlements Programme, 2012.
48. UN-Habitat. *Gender Issue Guide: Urban Planning and Design*. Nairobi: United Nations Human Settlements Programme, 2012.
49. Denton, Fatma. Climate change vulnerability, impacts, and adaptation: Why does gender matter? *Gender & Development*, (2002). 10(2): p. 10-20.
50. Moser, Caroline. *Gender planning and development: Theory, practice and training*. New York: Routledge, 2012.
51. Nussbaum, M. Human rights and human capabilities. *Harvard Human Rights Journal*, (2007). 20: p. 21-22.
52. Baillot, Helen, Sharon Cowan, and Vanessa E. Munro. Second-hand Emotion? Exploring the Contagion and Impact of Trauma and Distress in the Asylum Law Context. *Journal of Law and Society*, (2013). 40(4): p. 509-540.
53. Schön, D. and M. Rein. *Frame re lection: toward the resolution of intractable policy controversies*. New York: Basic Books., 1994.
54. Schön, D.A. *The re lective practitioner*. New York: Basic books 1983.
55. Oliver-Smith, A. Antropological Research Hazards and Disasters. *Annual Review of Anthropology*, (1996). 25: p. 303-328.
56. Hammersley, Martyn. Ethnography, in *The Blackwell encyclopedia of sociology*, George Ritzer, Editor John Wiley & Sons: London, (2015).
57. Hammersley, Martyn and Paul Atkinson. Ethnography and participant observation, in *Handbook of qualitative research*Sage Publications: London. p. 248-261, (1994).
58. Roper, Michael. Analysing the analysed: Transfer and counter-transference in the oral history encounter. *Oral History*, (2003). 31(2): p. 20-32.
59. Sletto, Bjørn. *El Rincón de los Olvidados: Methods for Risk and Vulnerability Assessment in Informal Settlements*, School of Architecture, University of Texas: Austin2008.
60. Love, Peter, Gary Holt, and Heng Li. Triangulation in construction management research. *Engineering, Construction and Architectural Management*, (2002). 9(4): p. 294-303.
61. Kouprie, Merlijn and Froukje Sleeswijk Visser. A framework for empathy in design: stepping into and out of the users life. *Journal of Engineering Design*, (2009). 20(5): p. 437-448.
62. McLaughlin, Emily A. . Design Charrette as Methodology for Student Learning Assessment Relative to Building Safety and Security. *Journal of Interior Design*, (2013). 38(2): p. 35-46.
63. Fortmann, Louise. Talking claims: discursive strategies in contesting property. *World development*, (1995). 23(6): p. 1053-1063.
64. Roe, Emery M. Development narratives, or making the best of blueprint development. *World development*, (1991). 19(4): p. 287-300.
65. Moezzi, Mithra, Kathryn B. Janda, and Sea Rotmann. Using stories, narratives, and storytelling in energy and climate change research. *Energy Research & Social Science*, (2017). 31: p. 1-10.
66. Paschen, Jana-Axinja and Ray Ison. *Narrative research*

- in climate change adaptation— Exploring a complementary paradigm for research and governance. *Research Policy*, (2014). 43(6): p. 1083-1092.
67. Engle, J. Stories of tragedy, trust and transformation? A case study of education-centered community development in post-earthquake Haiti. *Progress in Planning*, (2018). 124: p. 1-34.
 68. Särkelä, Elina and Juha Suoranta. The Method of Empathy-Based Stories as a Tool for Research and Teaching. *The Qualitative Report*, (2020). 25(2): p. 399-415.
 69. Fairclough, Norman and Ruth Wodak. Critical discourse analysis. *Discourse studies: A multidisciplinary introduction*, (1997). 2: p. 258-284.
 70. Roe, Emery. Development narratives, or making the best of blueprint development. *World development*, (1991). 19(4): p. 287-300.
 71. Bornstein, Lisa. Planning and peacebuilding in post-war Mozambique: from narratives to practices of development. *Journal of Peacebuilding & Development*, (2008). 4(1): p. 1-15.
 72. Yin, Robert K. *Case study research: design and methods*. 3rd ed. Applied social research methods series. Thousand Oaks, Calif.: Sage Publications, xvi, 181, 2003.
 73. Lavell, Allan. *Estado, sociedad y gestión de los desastres en América Latina: en busca del paradigma perdido: Soluciones Prácticas*, 1996.
 74. Oliver-Smith, A. Successes and failures in post-disaster resettlement. *Disasters*, (1991). 15(1): p. 12-23.
 75. Oliver-Smith, A. Anthropological Research Hazards and Disasters. *Annual Review of Anthropology*, (1996). 25: p. 303-328.
 76. Schipper, E Lisa F, et al. *Community-based adaptation to climate change: Scaling it up*: Routledge, 2014.
 77. Wisner, B. Risk and the neoliberal state: Why post-Mitch lessons didn't reduce El Salvador's earthquake losses. *Disasters*, (2001). 25(3): p. 251-268.
 78. Menter, Harriet, et al. *Scaling up. Scaling up and out: Achieving widespread impact through agricultural research*, Centro Internacional de Agricultura Tropical (CIAT), Cali, Colombia, (2004): p. 9-24.
 79. Bunn, Christian, et al. Recommendation domains to scale out climate change adaptation in cocoa production in Ghana. *Climate Services*, (2019). 16: p. 100123.
 80. Westermann, Olaf, Philip K Thornton, and Wiebke Förch. *Reaching more farmers: innovative approaches to scaling up climate-smart agriculture*. (2015).
 81. Gargani, John and Robert McLean. *Scaling Science*. *Stanford Social Innovation Review*, (2017)(Fall): p. 34-39.
 82. McLean, Robert, John Gargani, and Dena Lomofsky. [Scaling what works doesn't work: we need to scale impact instead](#). *London School of Economics Impact Blog* (2020).
 83. McLean, Robert and John Gargani. *Scaling impact: Innovation for the public good*. New York: Routledge, 2019.
 84. Westoby, Ross, et al. Sharing adaptation failure to improve adaptation outcomes. *One Earth*, (2020). 3(4): p. 388-391.
 85. Westoby, Ross, et al. Locally led adaptation: drivers for appropriate grassroots initiatives. *Local Environment*, (2021). 26(2): p. 313-319.
 86. Roe, Emery. *Narrative policy analysis: Theory and practice*. London: Duke University Press Books, 1994.



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