Institution: The University of Edinburgh and Heriot-Watt University (Edinburgh Strategic Alliance)

Unit of Assessment: UoA 13: Architecture, Built Environment and Planning

Title of case study: Environmental risk co-management policy and interventions protect low-income and vulnerable communities in Latin America

Period when the underpinning research was undertaken: 2004-2020

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Soledad Garcia-Ferrari	Professor, University of Edinburgh	2007-present
Harry Smith	Professor, Heriot-Watt University	2002-present
Gabriela Medero	Professor, Heriot-Watt University	2006-present

Period when the claimed impact occurred: 2016-2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact

Action research into community and local government approaches to managing environmental risk in informal settlements, has empowered communities in Latin America to participate in managing environmental risks that are intensifying due to climate change. This has improved the lives of over 1,393 households directly through neighbourhood mitigation plans and implemented works, and has benefitted over 714,000 inhabitants indirectly through municipal policies and regulations.

It has led to policy reforms that address the connected environmental and social issues faced by vulnerable neighbourhoods; overcome barriers to cooperation between communities and local government; and improved the awareness, understanding and management of hazards such as landslides and floods, through environmental education, and mitigation and adaptation initiatives.

2. Underpinning research

Self-built and low-income neighbourhoods in low- and middle-income countries are often located on land exposed to environmental hazards, many of which are intensifying due to climate change. Our international team identified, investigated and pioneered collaborative approaches enabling communities, local governments and academia to co-manage environmental hazards in cities in the Global South. Much of the work has taken place in Medellín, Colombia, a key strategic location because of the global recognition the city has gained for innovative urban planning [3.1].

Drawing on previous research on urban development in Latin America [3.2, 3.3, 3.4], the research addresses community-located projects through workshops, public meetings and events engaging local groups and government organisations. Via our action research, volunteers collected data, communities built temporary mitigation works, and local focus groups evaluated outcomes. Our emphasis on action research and ongoing risk management at scales and timescales relevant to local communities differentiates this research from recent work by others that retrospectively focuses on post-disaster mitigation.

Smith and Garcia-Ferrari used a British Council Institutional Link Grant (2015-18) to develop a collaborative research agenda with local stakeholders, addressing social equity and environmental sustainability in Medellín, with a major focus on housing and habitat. Two

GCRF-funded projects led by Smith investigated co-production of landslide risk management strategies by informal settlement residents and city officials, initially in a pilot in Medellín (2016-17, co-led by Prof Francoise Coupé, Universidad Nacional de Colombia (UNAL) – NERC) and subsequently in three neighbourhoods in Medellín and São Paulo (2017-19, co-led by Coupé and Prof Alex Abiko, Universidade de São Paulo (USP) – The British Academy). In Puebla, Mexico, a second Newton Fund Institutional Links project (2019-20), led by Garcia-Ferrari (co-led by Dr Emma Morales, Universidad Iberoamericana Puebla (UIP)), tested community-led strategies for climate change adaptation in urban and rural-urban boundary areas. This was complemented with a Newton Fund Impact Scheme project in Puebla led by the same researchers.

The research found that:

1. Large parts of Medellín's population are at risk not only from landslides but also from insecure tenure and poor living conditions in informal rental housing. The threat of eviction prevented communities openly acknowledging landslide risk and engaging in dialogue with local government. However, government officials are often eager to work with communities to mitigate hazards in high-risk areas [3.5].

2. Communities can engage in projects and policy-focused initiatives to manage environmental risks on their own terms, using their own resources. Community volunteers are capable of systematic data collection (e.g. photographic monitoring), adding to their knowledge of their territory and empowering them to use this data to engage with local government [3.5].

3. Risk mitigation at different scales requires new forms of community-state interaction. Small working-groups of community leaders and local officials are effective at the neighbourhood level, but co-produced landslide risk mitigation strategies at municipal level require new methods to engage wider community representation and officials in city government [3.6].

3. References to the research

[3.1] Garcia-Ferrari, S., Smith, H., Coupé, F. & Rivera, H. (2018), 'City Profile: Medellín', *Cities*, 74, 354-364. https://doi.org/10.1016/j.cities.2017.12.011

[3.2] Smith, H. (2004), 'Costa Rica's Triangle of Solidarity: can government-led spaces for negotiation enhance the involvement of civil society in governance?', *Environment & Urbanization*, 16(1), 63-77. https://doi.org/10.1177/095624780401600106

[3.3] Jenkins P., Smith H. & Wang Y. P (2007), 'Urban Development and Housing in Latin America', in *Planning and Housing in the Rapidly Urbanizing World*, Abingdon, Oxon & New York: Routledge, 235-265 (Can be supplied by HEI on request)

[3.4] Garcia-Ferrari, S., Smith, H. & Calderón E. (2018), 'Contemporary Tendencies in Colombian Urban Planning: The Case of The "Planes Parciales" in Medellín', *International Planning Studies*, 23(4), 355-375. https://doi.org/10.1080/13563475.2018.1500276

[3.5] Smith, H. Garcia-Ferrari, S., Medero, M., Rivera, H., Coupé, F., Caballero, H., Castro, W., Abiko, A., Marinho, F. & Ferreira, K. (2020), 'Learning from Co-produced Landslide Risk Mitigation Strategies in Low-income Settlements in Medellín (Colombia) and São Paulo (Brazil)', in A. Ley, A. U. Rahman & J. Fokdal (eds), *Housing and Human Settlements in a World of Change*, Bielefeld. Transcript: chapter 10. https://doi.org/10.14361/9783839449424-013

[3.6] Smith, H., Coupé, F., Garcia-Ferrari, S., Rivera, H. & Castro, W. (2020), 'Towards Negotiated Mitigation of Landslide Risks in Informal Settlements: Reflections from a Pilot

Experience in Medellin, Colombia', *Ecology & Society,* 25(1):19. https://doi.org/10.5751/ES-11337-250119.

4. Details of the impact

The research has transformed low-income communities' and local governments' understanding of how to co-manage environmental risk (landslides and flooding) in informal and deprived neighbourhoods. It has empowered them to co-produce risk-reduction strategies; initiated practical and social improvements to manage these risks; informed policy on mitigation of environmental risks; and introduced new regulations on informal rental housing. It has directly benefited over 3,400 vulnerable households exposed to landslide risk in the major Latin American cities of Medellín (Colombia), São Paulo (Brazil) and Puebla (Mexico) through neighbourhood mitigation plans and implemented works [5.6]. Indirectly it has benefitted over 714,000 inhabitants through municipal development policies (there are 560,000 inhabitants in informal settlements out of a total population of 2.2 million in Medellín – see Figure 2 in http://www.revistaespacios.com/a19v40n14/19401422.html – and 154,000 residents in Puebla [5.11]). Through new policies and regulations [5.2], it has also benefitted the estimated over 20,000 residents who live in informal rental housing in Medellín (see p. 13 in http://www.medellin-urban-innovation.eca.ed.ac.uk/wp-content/uploads/2016/04/Coupe.pdf). The longer-lasting impacts are the shift in attitudes from confrontation (linked to the threat of eviction) to co-operation between communities and local government on environmental risk management in Medellín and São Paulo, and the recognition by local government of certain previously ignored groups such as those in informal rental housing in Medellín and community organisations in indigenous settlements in Puebla. These impacts and how they were achieved are detailed as follows:

Informing policies and regulations in Medellín

Research recommendations which became policy in the Medellín Municipal Development Plan (approved June 2016, implemented by the Municipality and its agencies 2016-19) included: integrating the concept of *habitat* into housing policy; recognising hillside settlements as part of the city; regulating informal rental housing; mitigating landslide risk using bio-engineering; and establishing greater clarity in integrated approaches for housing, habitat and neighbourhood improvements [5.1]. This was the result of an event we organised in Medellín on Housing & Habitat, involving local academics, NGOs, communities and local government in April 2016, as part of the initial Link Grant (Colombia) project, which generated recommendations that were submitted to the Medellín Municipal Development Plan consultation process.

Inclusion of informal rental housing in the Municipal Development Plan led to our lead researcher in Colombia (Coupé) being commissioned by the Medellín Social Institute for Housing (ISVIMED) to produce a research report and draft policy on informal rental housing (approved December 2016). She then co-drafted regulations for implementation of the policy (approved February 2019), which aims to improve living conditions for the estimated over 20,000 people living in this type of accommodation in Medellín [5.2].

Projects in Colombia and Brazil changed how local governments work with low-income communities to mitigate environmental risk.

Our initial GCRF NERC-funded pilot project on landslide risk established a risk mitigation working group of community leaders and local government agencies (ISVIMED, Municipal Planning Department, Municipal Disaster Risk Management Department (DAGRD), and the Urban Development Company (EDU)) in Medellín, which ended the impasse between local government and informal settlement residents [5.3 & 5.4]. In 2020 the Municipality's Disaster Risk Management Department initiated a project to co-produce an Integrated Risk

Management Plan for NE Medellín, which will benefit an estimated 200,000 people, applying our research methodology [3.6] and involving us as partners [5.4]. Our action-research approach attracted involvement from government organisations in the state of São Paulo, Brazil, which seconded two staff members from each partner institution [5.5]. This changed the relationship between the participating low-income community of Vila Nova Esperança in São Paulo and the state-run and major landowner Housing and Urban Development Company from confrontation to collaboration, thus removing the threat of eviction [5.5].

Action-research to better manage landslide risk in four low-income communities

In Medellín and São Paulo, our GCRF-funded projects trained and co-ordinated community volunteers who monitored and analysed potential landslides hotspots, identified low-cost mitigation measures, and liaised with local government to co-ordinate these with municipal efforts. In the 2016-17 pilot project the community installed emergency low-cost mitigation works that improved drainage. Mitigation works affecting 30 households were built [5.6]. The follow-on action-research in two further neighbourhoods in Medellín and one in São Paulo generated risk mitigation plans that were adopted by the communities. The projects directly benefited 1,293 households (5,200 people) across the four participating communities [5.6].

Changing attitudes towards environmental risk mitigation in communities and local government

Our research team facilitated the convening of Medellin's first ever town meeting focused on risk mitigation, in August 2017, at which we relayed the findings from an initial pilot project to communities where many low-income populations are at risk of landslides. Such public meetings (*Cabildo Abierto*) are convened by Local Administration Boards, and local government is required to attend, and hear and respond to community petitions. 670 community residents and organisations, and local government representatives attended. A second *Cabildo Abierto* for the same sector was held in 2018, with similarly high attendance and participation [5.7]. Medellín's School for Hillside Neighbourhoods has incorporated the findings and approach from the two ventures into their landslide risk management training, delivered to 40-50 community leaders annually [5.8].

Local NGOs and staff in the Medellín's Planning Department and DAGRD praised the change in "tone" and "transformation" in the community-municipality relationship [5.4], and commended the contribution by residents to "generate a data culture in the community organisations, in the sense of carrying out systematic exercises to better understand land mass movements and prevent landslides." [5.9]

Our projects in Mexico helped to consolidate the work of local grassroots organisations by providing tools and strategies to build bodies of expertise.

The Newton Fund projects enabled horizontal dialogues (treating partners as equals) with groups contesting the 2018 Urban Development Plan for San Andrés Cholula, Puebla, through a series of focused workshops that engaged both local knowledge and experience of climate change impact and the principles and policies of the Development Plan. As a result of these dialogues, capacity-building sessions with local communities were organised in which local authorities' technical knowledge was shared, and which empowered grassroots organisations, improving the latter's negotiation skills with governmental bodies and leading to their formalisation as well as to winning an award for their community work [5.10]. These initiatives yielded practical environmental improvements such as co-producing small house and street actions to increase surface porosity and green drainage and improve water catchment affecting 100 households in the community of Santa María Tonantzintla, protecting them from flooding [5.10].

Resulting from these interactions, the proposals to address climate-change risks developed by grassroots organisations through dialogue and knowledge sharing facilitated by our

research, have been included in the (2020) Draft Environmental Management Plan for San Andrés Cholula, which affects an estimated 154,192 residents in 2020 [5.11, p. 202, Table 52]. The dialogue between communities, local government and academia has contributed to practical solutions but also to a deeper conversation on broader purposes of community participation in consultation processes and the initiation of a legal recognition process of the indigenous settlement of Cholula [5.11].

5. Sources to corroborate the impact

[5.1] Copy of the 'Recommendations to the Municipal Development Plan' produced by the research team, together with before and after versions of the Municipal Development Plan, highlighting in the finally approved version the wording that relates to the recommendations from the research team
[5.2] Copies of the policy and regulations on informal rental housing and contracts between ISVIMED and our Co-I Coupé
[5.3] Testimonial from Empresa de Desarrollo Urbano de Medellín (EDU) can be obtained from Giovanny Marín: Giovanny.marin@edu.gov.co
[5.4] Letter from the Medellín Disaster Risk Management Department (DAGRD)
[5.5] Letters from IPT and IG
[5.6] Photographic evidence of community-based landslide risk monitoring through WhatsApp groups and of the process of construction of emergency mitigation works (before, during and after)
[5.7] Special Bulletin (No. 31) on the *Cabildo Abierto* from the *Mesa Interbarrial de Desconectados*, which also included a page dedicated to the 'Voices from the Academy', which explained the GCRF NERC 'Resilience or Resistance?' project
[5.8] The two local NGOs (Con-Vivamos and Corporación Montanoa) and Comuna 8 Housing and Public Services Community Board produced a video about the landslide training at the Escuela Territorial de Barrios de Ladera
[5.9] Letters from 3 NGOs (Con-Vivamos, Montanoa and Corporación Jurídica Libertad), 1 community council (JAC El Pacífico) and 2 district-wide community organisations (Mesa de Vivienda and Mesa de Desplazados). See quotes in section 4
[5.10] Letter from local grassroots organisation 'Comité Tonantzintla'
[5.11] Email from project lead in Mexico to Local Authority San Andres Cholula and Draft Environmental Management Plan for San Andres Cholula (2020) which includes findings from our research workshops with the community.