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Learning from the Global South: Co-producing evidence for Climate Change policy

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Learning from the Global South: Co-producing evidence for Climate Change policy

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INTRODUCTION

Climate Change has gradually become an important issue on the political agenda in developing countries. The urgency of this was initially only fully understood by the scientific community and those directly involved in the international negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). Today, however, it is a prominent topic with growing public awareness (Schmidt et al, 2013). It is an integral part of the discourse of major world leaders when speaking about the main challenges to be faced in the future (Father Francis, 2015; Obama, 2015). However, there is still a gap between this discourse and concrete action. Climate Change still competes with other urgent development priorities such as: education, health, housing; and more salient and difficult processes across developing countries such as: wars, peace processes, reconstruction processes (due to natural disasters) and the resolution of local environmental issues. Researchers and policy-makers argue it is critical to articulate Climate Change concerns with development goals for developing countries and to really integrate mitigation and adaptation policies into their agendas.

The political and socio-economic context across the world has contributed to the fact that most countries are still reluctant to make the commitment required to achieve the ambitious goal of limiting global warming to less than 2°C, as recommended by the IPCC (Climate Action Tracker, 2015). Additionally, at institutional level, the State does not seem to be prepared to address the challenges posed by Climate Change (Echeverri, 2000). While many countries have strengthened environmental institutions and have created specific departments to address this issue, the results are still insufficient. Most countries lack financial resources and technical capabilities. They have no defined legitimate and shared objectives, and above all, lack the required leadership to facilitate the coordination and transformation that Climate Change policies demand (Kane, 2014; and Dingwerth Biermann, 2004). These challenges are compounded in the global south, where one usually finds ‘weaker states’ with less technical and financial capability and significant social, environmental and economic problems (Biermann & Dingwerth, 2004).

However, among developing countries we can see interesting experiences of design and implementation of mitigation policies. During the past four years Brazil, Chile, Colombia and Peru have worked on estimating reference scenarios in terms of emissions; analysing mitigation actions suited to their institutional, economic and political context; and making projections of future scenarios to present alternatives that are relevant for Climate Change policy-making as part of the Mitigation Action Plans and

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1 For most of the cases analysed by Schmidt et al, 2013, there is an upward trend in media coverage of Climate Change topics with peaks in the years of the COPs.

2 In May 2015 Pope Francis published the encyclical “Laudato Si”, in which he refers directly to the scientific references provided by the IPCC to support the argument in favor of climate change. “A very solid scientific consensus indicates that we are presently witnessing a disturbing warming of the climatic system” (Laudato Si, pg. 18, 2015) and there is urgency for humankind to address climate change. “Humanity is called to recognise the need for changes of lifestyle, production and consumption, in order to combat this warming or at least the human causes which produce or aggravate it.” (Laudato Si, pag 18, 2015)

3 In 2015 President Obama launched his action plan for Climate Change, arguing there is urgency to act now, or “condemn our children to a world they will no longer have the capacity to repair”. Obama called on international leaders to move toward change, “It’s not enough to just talk the talk.” (NBC news, September 1st 2015). There is more information about Obama’s plan at: https://www.whitehouse.gov/climate-change

4 The analysis of the INDC presented to date shows that most of the countries have pledge a level of ambitious evaluated as inadequate to reach the goal of limiting an increase of the average temperature on less than 2°C. For further information see: http://climateactiontracker.org/assets/publications/briefing_papers/CAT_EmissionsGap_Briefing_Sep2015.pdf

5 In 1993, Colombia launched its Ministry of Environment. In 2011, the Ministry became the Ministry of Environment and Sustainable Development, and the Department of Climate Change was created.

6 The vulnerability, adaptive capacity and disaster preparedness of nation states are therefore inextricably linked to the level of economic development, as well as to a number of additional socio-economic factors. As a general statement, however, global environmental change, by requiring states to prepare for and adapt to its consequences, increases the demand for the administrative, organisational, technological and financial capacity of the nation state, which some states will find easier to meet than others (Biermann and Dingwerth, 2004).
Scenarios (MAPS) Programme. Among the important results of these processes, has been the compilation of evidence to define the Intended Nationally Determined Contributions (INDC) submitted by these countries to the UNFCCC before COP 21 in Paris in December 2015.\(^7\)

International cooperation on Climate Change has emphasised the role of quantitative evidence as a critical and desirable starting point for defining policies to mitigate Climate Change based on GHG estimates, abatement costs quantification, and economic impact evaluations. At the same time, the international community has been called to produce quantitative information to support pledges to mitigation from different countries, with the aim of guaranteeing that commitments can be tracked and verified and that a ton of CO2 measured in X country is recognised as a ton by all the international community. Most of the countries that are formally initiating their design and formulation of Climate Change policies follow the same process: i) building data to measure and monitor Climate Change; ii) evaluating potential mitigation actions (relying on international methodologies); and in most cases, iii) experiencing processes that are mostly externally driven and tailored to the requirements of the international community of practice on Climate Change. Building quantitative evidence not only seems to be relevant, but also a legitimate pathway to define public policies on Climate Change across countries.

From a sociological perspective, science and the process of building evidence are socially constructed processes. Therefore, it is necessary to be aware that there are multiple alternatives to address these tasks, and that different approaches can facilitate or hinder the contribution of an evidence-building process for the domestic requirements of developing countries. Thus reinforcing the generation of knowledge contextually situated and potentially useful to trigger processes of social learning that can contribute to necessary transformations to transition toward a low-carbon development.

The MAPS Programme is a south-south collaborative initiative started in South Africa during 2005 that aims to generate evidence to inform policy-making on Climate Change and to facilitate low-carbon development among developing countries. Almost all methodologies applied by MAPS belong to the standard tradition imposed by the international community of practice on Climate Change. The ‘evidence building’ process of the MAPS approach is where the ‘standard traditions’ occur (e.g. economic and energy modelling). However, the MAPS approach seeks to thematise the relevance of thinking about “the way we do things” as a critical dimension, as relevant as “what we do”. This recognises the value of thinking about how the methodologies are applied, what kind of information is used and for whom the final results will be significant.

Within a theoretical discussion about the contribution of evidence for policy-making processes and the relevance of thematising the process of building knowledge as a social process, this analysis of the MAPS experience aims to understand to what extent building evidence could contribute to domestic Climate Change policies; and under which conditions these processes could maximise their contribution to strengthening the transformations required to respond to Climate Change challenges across developing countries.

This paper relies on three studies conducted in Peru, Colombia and Chile during the last semester of 2014 and the first semester of 2015 to analyse - from a process perspective - the experiences on the implementation of the MAPS approach in these countries. Each case was studied using a common framework focusing on the social process of knowledge building and the interaction with the institutional and political frameworks of the different countries to understand how the processes of co-

\(^7\) For more information about the submission of INDCs see at: \(\text{http://www4.unfccc.int/submissions/INDC/Submission%20Pages/submissions.aspx}\)
production of evidence work under different institutional contexts, as well as what lessons can be drawn from the analysis of the three experiences. The main objective was to analyse the processes of the socio-technical interactions applied in the different countries; to link science and public policy; and to learn and identify best practices that might be useful for other countries. Even though Brazil was also part of the MAPS Programme in Latin America, the analysis of that case was not included in this paper because of timing issues. The Brazilian case will be available as part of the MAPS working papers to be published on the MAPS website.

The purpose of this paper is fivefold. Firstly, to present a review of the literature about the role of evidence in policy-making with the aim of developing a framework for analysis from the perspective of the sociology of science and technology using the concept of co-production of knowledge as a way of understanding the interface between science and public policy. Secondly, the main aspects of the MAPS Programme are described to understand the key elements of the methodology and the strategy proposed to address Climate Change policy in developing contexts.

Thirdly, some relevant highlights of the three countries are presented including their Climate Change policy experience and the description of the political momentum and institutional framework that embraced the projects at their inception. Fourthly, it presents a proposal of key elements to facilitate a process of co-production of knowledge suitable to the needs and structural conditions across developing countries; including an outline of the most important contributions of the process of co-producing evidence in terms of the main challenges and opportunities that the MAPS Programme presented. Finally, the paper ends with a reflection of the main lessons and future challenges of the three countries in their journeys of continuously building evidence for Climate Change policy and moving into implementation.

This paper has enabled collaboration between researchers from Chile, Peru, Colombia and South Africa in the analysis of the particular cases and is the result of a joint deliberation about the learning and challenges emerging from these experiences. My hope is that it will contribute to increasing the understanding about Climate Change mitigation in the global south and facilitate a transition toward low-carbon development in our countries.
THE ROLE AND RELEVANCE OF EVIDENCE FOR CLIMATE POLICY-MAKING

The Climate Change community of practice is closely linked to the natural sciences, imposing a natural scientific paradigm as the dominant paradigm governing Climate Change policy efforts (Huq et al., 2006; Shove, 2010a). Natural sciences have been dominated by a positivist and materialist worldview analysing the world as something independent from those that study it, and ultimately, knowable with sufficient rational enquiry. Within this tradition, quantification is viewed as superior to qualitative ways of knowing; with accuracy, neutrality and objectivity all highly valued (Kane, 2014).

Consistent with this epistemological standpoint, the Intergovernmental Panel on Climate Change (IPCC) has technified the discussion about Climate Change and, together with the United Nations Framework Convention on Climate Change (UNFCCC), contributed to building a particular approach to deal with Climate Change issues. In their approach, they emphasise the relevance of quantitative and standardised measurements through the generation of protocols, standards and methodologies (Hiraishi, T, 2013); together with the study of discrete mitigation actions, technologies, and long-term low-carbon policy scenarios with an emphasis on the evaluation of technical and financial feasibility at the sectoral level (Rommetveit et al., 2010 cited in Tyler, 2015). Aligned with this feature, the UNFCCC has fostered the idea of achieving measurable and verifiable commitments as criteria of impartiality for building an international climate regime. Cross-country measurement of emissions and mitigations not only contributes to evaluate scientifically the global impacts of world emissions on Climate Change, but also to monitor and verify the commitments and compliances on mitigation from the different countries.

These processes of evidence building impose important challenges for those less developed countries with lower institutional capacities and important gaps in terms of information availability, financial resources and technical knowledge. More importantly, this raises the question of how to improve the usefulness of these efforts to satisfy domestic demands of building reliable information that is contextual and useful to trigger processes of social learning that can contribute to mitigation (beyond the fulfillment of international requirements for evidence-building).

Policy studies have a long tradition of discussing the role of evidence in policy-making. On the one hand, promotors of an evidence-based policy-making approach argue that policy and practice that is not informed by the best available evidence runs the risk of poor effectiveness, implying the potential paradox of implementing public policies that might actually harm society, more than benefitting it (Davis, 2005). In turn, Judge & Bauld (2001) argue there is a strong ethical case for ensuring that scarce resources are directed into those policies that the evidence suggests are likely to be most effective in addressing social problems. Specifically, on the issue of environmental policy, it is argued that science and public policy cannot be considered disconnected from each other, but as systems that constantly exchange views and products which are mutually defined, while they generate a common practice that strengthens environmental governance (Shackley, and Wynne S., B. 1995).

On the other hand, from an approach more linked to empirical analysis, it is argued that even though scientific evidence can be important for informing policy-making from a normative approach, it is not necessarily used because policy-makers take decisions...
based on multiple criteria beyond scientific results (Sanderson, 2006). In this sense, research results can be one of the many inputs for the policy process, and not necessarily the most influential. The contribution of evidence is usually surpassed by powerful political forces of inertia, expediency, ideology and financial concerns (Walker, 2000). It is also argued that policy-makers dismiss scientific evidence because of timing issues (they need to make decisions with urgency, without considering the time necessary for doing research). They also do so because of a lack of technical capacity and a tendency to disregard information that seems too complex, or evaluations and implications that are difficult to understand. (Cable, 2003). In addition, the role of personal values, experience, ideology and political insights has been gauged to explain why policy-makers usually give low priority to the use of evidence or simply decide to dismiss evidence to support policy decisions (Davies, 2005).

From a different perspective, the sociology of science and technology literature argues that whilst the relationship between science and policy-making remains relevant in our societies, it is necessary to understand how this relationship has changed over time and which new approaches are necessary to facilitate a fruitful interaction. From a rational analysis of decision-making processes, there is inter-dependence between values that proceed from interest situations, and techniques and knowledge that emanate from the scientific realm that can be utilised for the satisfaction of value-oriented needs. In this model, there is no strict separation between the functions of the expert and the politician; rather there is a critical inter-relationship, which creates an unavoidable intersection between science and policy (Van den Hove, 2007).

In addition, in our contemporary societies, it is argued we are experiencing an epistemological shift that puts the concepts of “risk” and “uncertainty” at the center of social life, and therefore also at the center of scientific development and policy-making. Surprisingly, considering what was expected from a modernist point of view, a higher level of knowledge and sophistication of the technological system has deepened the perception of risk and ignorance (Beck, 1992), showing that scientific and technological development has not brought greater certainty. On the contrary, it has engendered more and more uncertainty and a sense that our ignorance is greater than our knowledge (Callon, 2009: 19). Thus, the frontier of knowledge moves continuously and whilst science offers formal assessments based on logical reasoning, it cannot deliver absolute truths, nor absolute solutions (Jasanoff, 2003).

Meanwhile, the political system, even though it can justify its decisions using scientific evidence, faces high levels of scrutiny by the public. This is not only because of distrust in the decisions by the political system, but also because the public has become aware of the prevalence of radical uncertainties around issues of the environment, bio-technology, health implications and Climate Change, as well as many other topics. Scientific evidence cannot constitute a clear source of information and solutions, creating socio-technical conflicts that demand new approaches to produce and validate knowledge and decision-making (Callon, 2009).

As one of the possible answers, Jasanoff introduces the concept of “technologies of humility” understood as “methods or habits of thought” that seek to deal with the unknown, uncertain, ambiguous, and uncontrollable, recognising the limits of prediction and control. These technologies recognise our inability to predict the future and all the implications of our actions perfectly, and therefore promote the development of governance structures to articulate different capacities of experts, decision-makers and society in general (Jasanoff, 2003).
In the same vein, the concept of “post-normal science” states that when public policy decision making became complex due to uncertainty, as in the case of Climate Change policy, scientific knowledge remains valuable, but it can only deliver partial understanding of a particular phenomenon (Van den Hove, S., 2007; Sarkki. et al 2014; Engels, A., 2005). In this situation, the scientific community is called to share and validate their findings with a wide range of society actors (Sedlacko, M. et al, 2013). This means that researchers might need to open the ‘black box’ of research practices, thematising assumptions and the methodologies they use (Callon, 2009; Van den Hove, 2007). This can result in the formation of peer review communities that allow anyone (experts and non experts) interested in contributing and ensuring the quality of the process to participate through the review of methodologies and scientific findings and a process of co-production of knowledge. This means building a dialogue process that allows a plurality of perspectives to gain acceptance; and at the same time strengthen and provide relevance to scientific evidence (Funtowicz, S. and Strand, R., 2007).

Through these processes of co-production of knowledge, “facts are accepted as authoritative, not necessarily because they can be empirically verified, but because they are validated through processes of informal negotiation and can be ranged into frameworks of shared assumptions and inferences” (Jasanoff, 1987). In this sense, processes to build trust become relevant to increase credibility. "Without such trust relationships, then no matter how well the science is produced on its own terms (rigor, accuracy, robustness), it will struggle to be accepted” (Wynne, 1991; Wynne, 1992; Wynne, 2007). From the sociology of science and technology perspective, a basic understanding is that scientific evidence is always socially produced, and current conditions of complexity and uncertainty of the modern world demand new practices for facilitating the interaction between scientific work and policy-making processes.

**THE MAPS APPROACH**

Mitigation Actions Plan and Scenarios (MAPS) is a programme based on a South-South collaboration facilitated by a South African team, with the aim of building evidence to inform Climate Change policies in developing countries. Based on the experience of the implementation of the Long-Term Mitigation Scenarios (LTMS) project in South Africa in 2005-2008, the MAPS Programme created a methodological and organisational approach that was contextualised and implemented by four countries in Latin America (Brazil, Chile, Colombia and Peru). The MAPS Programme was originally defined by a focus on enhancing collaboration between developing countries with the aim of generating robust, legitimate and credible knowledge regarding mitigation scenarios and future pathways for low-carbon development.

Its methodological approach included building evidence using domestic research by participating countries, together with a participatory process involving stakeholders from all national sectors, to co-produce knowledge about mitigation scenarios. The organisational approach included the development of a governance structure to articulate the participatory process and the interface between research activities, public policy and stakeholders’ interests. This approach anticipated increasing the legitimacy, robustness and credibility of evidence by enriching the traditional way of addressing scientific research – made by researchers on their own – through a facilitated process with local experts from multiple sectors and disciplines. Research products across the processes have included reference and mitigation scenarios, action plans, mitigation action libraries and the evaluation of socio-economic implications of mitigation actions, among others.
The main hypothesis behind this approach is that “co-production of knowledge fundamentally transforms how the research is conducted and knowledge is produced” (Raubenheimer, et al., 2015). The final aim of the project is to achieve lasting transformational impact, country ownership, long-term understanding with deep stakeholder engagement and world-class modeling (Kate Hampton, CIFF cited at Raubenheimer, et al., 2015).

To date MAPS includes the following processes:
- Implicacoes Economicas e Sociales (IES) Brazil, 2013-15 in Brazil,
- MAPS Chile, 2011-2015 in Chile,
- Planificacion Ante el Cambio Climatico (PlanCC), 2012-2015 in Peru,

Each country has had the autonomy to adjust the approach and methodology according to its own institutional, political and economic contexts. As part of the South-South collaboration, the programme creates a knowledge platform for researchers and facilitators from all MAPS countries to share lessons and construct good practices for research; and for the design and implementation of the co-production process.

INSTITUTIONAL AND POLITICAL CONTEXT WHERE MAPS WAS NESTED

The aim of this section is to provide a general idea of the institutional context in which MAPS was nested in each country; it is not broad and extensive in detail. More information can be found in the articles devoted to the analysis of the Peruvian, Colombian and Chilean cases (Calfucoy, 2015; Chávez & Bazán, 2015; Lema & Tibaduiza, 2015) and in the analysis of the governance structures for Climate Change in the countries, published by the MAPS Programme (Rebolledo, I., Tobar, N., Urmeneta, C., Rudnick A., 2015).

Institutions

Chile, Colombia and Peru share the similar condition of having relatively young formal institutions to address Climate Change issues. All the countries are at an early stage on the pathway toward integrating Climate Change into their political agendas, in the process of building institutional and individual capacity and therefore, in defining and implementing Climate Change policies (Calfucoy, 2015; Chávez & Bazán, 2015; Lema, 2015). As with other developing countries, most mitigation actions have been implemented as a result of developmental drivers such as energy efficiency, provision of public transport or waste reduction, and not necessarily for mitigation purposes (Boyd & Coetzee, 2013; Garibaldi et al., 2014; Tyler, Boyd, Coetzee, & Winkler, 2013).

For all three countries, Climate Change still remains a policy issue linked to environmental concerns and it is not fully integrated into their developmental agenda; neither as an important constraint, nor an opportunity. Colombia might stand out in this regard because it is in the process of defining a Low Carbon Emission Development Strategy. All countries have Climate Change Departments located at the Ministry of Environment (young institutions only created these in the early 2000’s) and are usually politically weak in comparison to the prominence given to other sectors like energy or finance. Even though sustainability issues are becoming part of the rhetoric of the different governments, there is still a gap between what is declared and the concrete
actions pursued by the different states (Rebolledo, I., Tobar, N., Urmeneta, C., Rudnick A., 2015).

Generally, the countries faced a lack of resources to address mitigation studies and policies, so the generous contributions to fund the MAPS Programme were welcomed. Lack of funds was a key factor facilitating the implementation of the MAPS approach across countries. At the inception of MAPS, the countries had projections for emissions but they were, in some cases, not aggregated at a national level, nor sufficiently robust. There were also no credible official baseline emissions for their economies. Further, before MAPS, where evaluations of mitigation actions had been conducted, they were individual efforts that were not widely known or shared with experts and stakeholders. Regarding the welfare impacts of mitigation policies across the countries, there was a lack of information about the socio-economic impacts of mitigation actions and the application of macro-economic models for the analysis was new in most cases. This timing and context facilitated the reception of the MAPS approach. Subsequently, the timing of the international negotiations favored the possibility of addressing this task properly because of the necessity for building evidence before the COP 21 in Paris, to support the Intended Nationally Determined Contributions (INDC) of the countries for the UNFCCC. Most of these conditions were not built by the project, rather they were guided by the context, which ultimately benefited the countries in their process for building domestic evidence about mitigation options and made the usefulness of the research results more evident.

The participation of the Peruvian, Colombian and Chilean State at the international debates and efforts to prevent, mitigate and manage the effects of Climate Change is similar in many aspects. For all countries, the first approach was driven by the international agenda as a result of their participation as members of the UNFCCC and their endorsement of the Kyoto Protocol. For all three countries, the Ministry of Foreign Affairs first addressed the topic of Climate Change, which was subsequently integrated into the domain of the Ministry of Environment. (The Ministry of Foreign Affairs remains as the political focal point to assure coherence in the international policy, and the Ministry of Environment has grown as the main technical body on Climate Change in each country) (Rebolledo, I., Tobar, N., Urmeneta, C., Rudnick A., 2015).

The three countries belong to AILAC (Association of Independent Latin American and Caribbean States) together with Costa Rica, Panama and Guatemala. As members of AILAC, these countries have embraced the idea that even though they are developing countries with an urgent need to address poverty and growth issues, they are willing to act to respond to Climate Change and move others to act without delay beyond the North-South disputes about responsibilities and fair contributions (Stories from the South, 2015).

After Copenhagen COP in 2009, important changes occurred across countries. In Peru the National Council for Climate Change was strengthened and the National Climate Change Strategy was reviewed. In 2010, the Ministry of Environment generated a first version of the Plan for Adaptation and Mitigation to Climate Change. At that time, Peru launched the first National Climate Change Strategy (ENCC, by its acronym in Spanish – Estrategia Nacional de Cambio Climático) and the National Programme for strengthening of capacities for handling the impacts of Climate Change and Air Pollution (PROCLIM by its acronym in Spanish) (Chávez & Bazán, 2015).

Although Peru presented mitigation efforts at Copenhagen, these commitments were mainly voluntary and not an urgent political issue for the country. When the PlanCC project started, no binding commitment framework existed that could motivate the State or private individuals to work under a more established process or to attempt to coordinate a national mitigation policy (Chávez & Bazán, 2015). However, in parallel to the implementation of the first phase of the PlanCC project (between 2012 and
2014) the evolution of international discussion also stirred the interest of some national political players, in particular that of Ministry of Environment. This interest focused on establishing a political discourse for building the fundamentals of the country’s position when it was their turn to facilitate the negotiations during the COP20, held in Lima in 2014. This gave impulse to several initiatives related to Climate Change, and in its latter stages, contributed by considering the evidence produced by PlanCC for articulating the intended nationally determined contribution (Chávez & Bazán, 2015).

In 2010, as part of its 2010-2014 National Development Plan, Colombia integrated four strategies to respond to climate change: i) the National Plan for Adaptation to Climate Change, ii) the Strategy for the Reduction of Emissions from Deforestation and the Degradation of Forests, iii) the Strategy for Financial Protection in the face of Disasters, and iv) the Colombian Low Carbon Development Strategy. One of the drivers to include Climate Change into the national political agenda was the acknowledgement of the country’s vulnerability to the effects of Climate Change, due to the harsh rainy seasons in 2010 and 2011; and its interest in becoming part of the Organisation for Economic Co-operation and Development (OECD) (Lema & Tibaduiza, 2015).

The first steps towards implementing a strategy for low-carbon development in Colombia emerged in 2010 from the Climate Change Group of the Ministry of Environment, Housing and Territorial Development (MAVDT). Once the concept of “LEDS” began to appear in the texts of the international negotiations on Climate Change, early discussions arose to understand how this concept could be developed locally. The idea of building Low Emissions Development Strategies was introduced into international negotiations on Climate Change during the Copenhagen Climate Change Conference in 2009 (COP 15), where it was proposed that developing countries, especially those with low emissions, should be provided with incentives to continue their low emission development path (UNFCCC, 2009). Later, in the 2010 Cancun Agreement, it was agreed that the developed countries should implement low-carbon development strategies and the developing countries should be encouraged to formulate their low-carbon strategies in a voluntary manner and within the context of sustainable development (UNFCCC, 2010) (Lema & Tibaduiza, 2015).

Under the leadership of the MAVDT, Colombia started the process of defining the Colombian Low Carbon Development Strategy (CLCDS) with the support of the European Union, UNDP, the German government and Australian government under the program “Low Emissions Capacity Building (LECB)”, the Low Carbon Resilient Development Program (LCRD) from USAID, and MAPS Programme in coordination with the National Planning Department and the Ministry of Environment (Lema & Tibaduiza, 2015).

In the case of Chile, the country presented a commitment in Copenhagen to achieve a 20% deviation from the business-as-usual emission trajectory by 2020, as projected from 2007. The definition of this goal was a political commitment, in which there was no consensus on estimates of the emission baseline for the country9. For the Ministry of Foreign Affairs and the Climate Change Office at the Ministry of Environment at the time, the MAPS programme (and the possibility of building evidence to inform the pledge) became an opportunity to address this challenge (Calfucoy, 2015). Even though Chile was part of the LECB program, there was no interaction or coordination between LECB and MAPS, and with any other specific policy or project on development issues.

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9 To date there is no baseline for the country, however there was an energy baseline (which includes energy, transport, mining, industry and CPR) and a non-energy baseline (which includes agriculture, forestry and waste). These cannot be added though, as they are methodologically different and were developed by consultants contracted by the Ministry of Energy and of Environment independently of one another.
MAPS IN THE COUNTRIES

Even though team members were made aware of the insights from the South African experience, all countries innovated their own methodological approaches and governance structure; and adjusted their research to domestic standards, emphasising areas where they were stronger. In all three countries, the MAPS Programme was identified as a governmental initiative aimed to develop technical and scientific evidence and strengthen capacities for exploring mitigation actions to build a low emission development pathway. Even though the countries shared the same aims, there were important differences in terms of the time spent on quantitative analysis versus the analysis of policy design and implementation processes. Colombia integrated the MAPS approach with other policy initiatives to build the Colombian Low Carbon Development Strategy and to set sectoral plans. Peru defined three phases for the project, moving from evidence generation toward analysis to facilitate the implementation of mitigation policies and strengthening institutional capacities. In Chile the focus was much more on building evidence for informing Climate Change policy without moving toward planning or implementation processes.

All three countries developed the MAPS Programme with political support expressed in a high-level mandate signed by ministers from the Environmental Ministry, as well as sectoral ones. However, the differences across countries in the institutional conditions and structure of governance of the project showed significant variation in terms of the institutionalisation of the projects and articulation with current public policy processes. Colombia was the country where the project was more linked to an institutional planning process, probably linked to the formal Colombian capacity to conduct these tasks for the long run.

When the MAPS Programme arrived in Colombia other relevant processes were in development under a common leadership who decided to integrate their efforts to build Climate Change policies together, under the hub of building a low-carbon development strategy for the country. As a consequence, the country actioned a complex and high-level structure of governance to build a National System for Climate Change (SISCLIMA by its acronym in Spanish) to guide the development and implementation of the Colombian Low Carbon Development Strategy. However, this system was never approved by law and the coordination finally in place included a steering committee that was composed of representatives from the Colombian National Planning Department (DNP), MAPS, the European Union, United Nations Development Program (UNDP) and the Director of Climate Change of the Ministry of Environment and Sustainable Development (Lema & Tíbaduiza, 2015).

The project integrated different sectors through the participation of professionals funded by USAID across the different ministries to build sectoral plans, a key component of the Colombian Strategy. Even though this structure provided the human and technical resources to address the task, it was not a guarantee of the integration of the sectoral plans into the real agenda of the ministries. Some of them achieved the goal of becoming part of the governmental priorities while others failed this target (Lema & Tíbaduiza, 2015).

In this formal structure the MAPS Programme provided a methodology. A research team from Los Andes University and a professional facilitator were hired to conduct several consultations about which parameters and assumptions to include in the

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23 Colombia has a Development Plan, a formal instrument approved by the congress and built with the aim of defining the priorities for the 4-year term of the government. Additionally, Colombia has a National Planning Department (DNP), a relevant institution with the responsibility of integrating policies and articulating sectoral efforts and the capacity to evaluate and follow up the different components of the National Development Plan.

24 The sectoral plan of sector became regulated by decree, which mean an important political and financial support to facilitate their implementation.
modeling processes; the most relevant mitigation actions to evaluate for the country; and the feasibility analysis of the final sectoral plans. This was not an easy process for Columbia. The research team was not experienced in all topics (they were expected to estimate emissions for all sectors of the economy and evaluate mitigation actions that rely on a different set of knowledge) and the role of a facilitator was not understood from the beginning. Despite Colombia’s long experience in participatory processes (under the context of the peace process) the team identified the necessity of including a person in charge of managing the processes, as a weakness; a different task from managing the project in terms of their institutional and financial needs. Colombia, as well as Chile and Peru, defined a Scenario Building Team and Technical Group made up of experts on Climate Change and sectoral issues to co-produce the evidence; integrating expert knowledge and formal modeling expertise (Lema, 2015). Colombia was always ambitious in its aim of integrating different efforts and institutionalising the results of the project as much as possible.

For Peru, the project was subject to less ownership by the government from the beginning. The institution in charge of the coordination and management of PlanCC was a private consultancy company. Together with the policy-makers involved from the beginning of the process, they argued a lack of capacity and resources to manage the project by the government. The Peruvian National Institution for Strategic Planning was scarcely involved in the process, playing the role of observer and stakeholder, but without a key role in the decision-making. “It should be also noted that, during the initial design phases of the project’s proposal, the political support of the Minister of Environment wasn’t as intense as in the latter stages of the project. In the final stages, the political context increased the awareness about the results of the project to define the country’s position and to facilitate the leadership of the COP20 in Lima. In any case the Ministry of Environment formally assumes the general supervision of the project, but not its technical conduction” (Chávez & Bazán, 2015).

The Peruvian process had a Steering Committee responsible for providing political guidance for the implementation of PlanCC. During the first phase of the project, a main member and an alternate member of the Ministry of Environment, Ministry of Finance, Foreign Affairs Ministry and the National Centre for Planning formed this committee. Additionally, the committee included a representative from the consultant firm in charge of the technical coordination of the project. During the two years of implementation of the first phase of PlanCC, the steering committee met a total of 23 times, almost on a monthly basis, indicating a relatively intense follow up of the project (Chávez & Bazán, 2015).

The consultancy firm played an important role as coordinator, hiring consultants and researchers from universities to conduct the research studies. For facilitating the iterative process of producing information and technical proposals PlanCC also faced important challenges in finding the right person for this work. Finally, as with the other two countries, PlanCC worked with a Scenario Building Team and technical groups made of national experts to provide detailed expert information to strengthening the participatory process (Chávez & Bazán, 2015).

In the Chilean case, the MAPS Programme was launched with strong political support under the leadership of the Ministry of Environment and counted on a high-level mandate from six ministries, which provided political support and relevance to the project from the beginning. The coordination of the project was by an ad hoc executive team (MAPS Chile executive committee) consisting of independent professionals, researchers from the Centre of Energy at the University of Chile and researchers from the Catholic University. However, from the beginning the Minister of Environment, through the participation of the Head of the Climate Change Office, maintained the leadership and guidance to facilitate the accomplishment of objectives and offered
political insights to assist in navigating the complex interface between research and public policy. The Steering Committee of the project comprising representatives from seven ministries, continued along the process providing important support. However, the acceptance of, and support for the MAPS results changed over time, particularly after high-level policy-makers realised the potential binding effect of MAPS results (Calfucoy, 2015).

Unlike Colombia and Peru, Chile does not have a specific institution for planning, nor a tradition of defining strategic development plans. Therefore, the most important institutional articulation of the MAPS Programme in the country was with the opportunity to generate the numbers to respond to the Chilean pledge at Copenhagen, which had set a deviation of 20% of emissions by 2020. This commitment set a practical need for estimating the baseline of emissions for the country and the accomplishment of the mitigation target. In that context, the project was framed as a non-binding process that would rely on the best scientific research available in the country to build the numbers to support the Chilean International Climate Change policy and the evaluation of potential mitigation actions to foster a low emission development path (Calfucoy, 2015).

The MAPS research team included people from the two main universities in the country, strengthening the credibility of the project’s results. A well-known academic from the University of Chile, Rodrigo Palma and four specialists from the University of Chile coordinated the research activities. These researchers worked as counterparts to the studies conducted by private consultants. Their participation provided a high level of stability for a four-year project, considering that these kind of activities are usually addressed by private consultants who rotate frequently in their tasks (Calfucoy, 2015). Economic issues connected to sectoral evaluations and general equilibrium analysis of the mitigation measures were handled by the economist Rodrigo Fuentes and his team from the Catholic University. Initially José Miguel Sánchez from the Catholic University acted as head of the team and contributed to the methodological design of the project (Calfucoy, 2015). Under this framework, the consultants expressed a positive valuation of having worked with professionals from the university as colleagues and the benefit of having experienced counterparts review their reports in detail, as well as the amount of time dedicated to monitoring and evaluating the consulting processes.

This, according to public sector interviewees, differs from the way that the state generally coordinates studies and consultants in Chile, as usually the technical partners lack the time and expertise to supervise the studies. One consultant reflected upon this situation saying that ‘generally I am contracted as an expert and therefore my counterpart is interested in the recommendations I make. In this case, I had a person who reviewed everything to the last detail and continuously questioned the methodological decisions and results, thereby collaborating continuously in improving the work’ (interview with consultant) (Calfucoy, 2015).

Regarding the facilitation of the meetings, Hernán Blanco has been the leader of this process since the beginning of the project, providing a high level of stability to the work. Even though he is an engineer, his work over the last 30 years has been in designing participatory process around sustainability issues. His knowledge as engineer and his abilities as facilitator contributed to the integration of multi-disciplinary knowledge and expertise (Calfucoy, 2015).
THE PROCESS OF BUILDING KNOWLEDGE COLLECTIVELY: DEFICITS AND OPPORTUNITIES

The processes for co-producing knowledge are evaluated in this paper based on the perspective achieved through the experiences of implementing the MAPS Programme in Peru, Colombia and Chile. The information used for the analysis comes from the three case studies previously mentioned and personal interviews conducted by the researcher. The analysis of the MAPS experience aims to understand the question: ‘How can evidence building contribute to domestic Climate Change policies and how can this process be strengthened’? The following section addresses this question.

Key considerations

1.1.1. How do countries define ‘participation’ as part of the MAPS Programme?

The participation of researchers, policy-makers and stakeholders for co-producing evidence cannot be understood exclusively as a participatory process. It is a socio-technical ongoing process of interaction that demands strong leadership. Furthermore, it demands the capacity of managing the project with flexibility to achieve the pursued objectives, as well as with the capacity to learn throughout the process and integrate those learnings into the practice to develop emergent strategies to respond to unknown scenarios.

In turn, the management of the process not only included activities to achieve the objectives, but also clear and conscious efforts to build trusting relationships based on transparency regarding the approaches, methodologies and final aims. These were based on strong leadership. The ‘system builder’ idea presented by Bijker, Hughes and Pinch, 2012, p46 reflects partially the characteristics of the leadership required to successfully achieve this task: a ‘system-builder’ has the ability to ‘force unity from diversity, centralisation in the face of pluralism, and coherence from chaos’. “Such a character requires deep ingenuity and an ability to work across traditional boundaries of discipline and scale” (Kane, 2015).

The three countries counted on leadership to facilitate the task. In Chile, Hernán Blanco and Rodrigo Palma introduced themselves as process and research leaders respectively. In the interviews participants revealed that they appreciated having leadership that they trust to make decisions impartially and not to abuse their positions given the diversity of opinions and interests of the members of the SBT (Calfucoy, 2015). The interviews demonstrated that the project’s capacity to be impartial in its treatment of the different sectors of the economy was considered a positive element. Hernán Blanco’s leadership was recognised as impartial, formal and clear – critical aspects in strengthening a good system of governance (Calfucoy, 2015).

The Head of Processes, Hernán Blanco held bilateral meetings when necessary to respond to consultations, clarify definitions, anticipate conflicts and provide detailed explanations on methodological decisions that were being taken. The research team, headed by Rodrigo Palma, also provided open spaces for revising and explaining the results in detail, which were occasionally used by people from the Scenario Building Team (Calfucoy, 2015).

In Peru, Lupe Guinand, the director of PlanCC, played a key navigating role towards the end of the project. During the development of the technical process, some of the institutions represented in the Steering Committee required complementary
information and discussion processes. This was to align them with the project’s priorities and enhance proper participation and cooperation in providing timely access to the sectoral information they possessed, for instance. The Research Team and the Technical Coordination team made presentations for different public institutions in which they were able to explain the project and its conceptual and methodological basis in order to facilitate cooperation from the public sector (Chávez & Bazán, 2015).

In this regard, the participatory process was not a process of consultation or validation of results based on the review of specific documents. It was a social interaction process that was achieved in varying degrees across countries. Iterative discussions and contributions built specific products, to the extent that the final documents were presented as a product from the researchers and stakeholders involved in the advisory and technical groups. Moreover, the participatory process meant the possibility of initiating a community of practice on Climate Change for the different countries. Variations in the management of this process made a difference in the level of cohesion achieved among the people participating in the MAPS Programme in each country.

1.1.2. Governance structure as a key issue to facilitate science-policy interface

The MAPS approach contributes to the countries with a proposal of governance structure. The South African MAPS team gave an example of a particular governance structure to the countries, which may have been/ could still be used in other applications. This governance structure consists of a Steering Committee comprised of ministries of state to provide political guidance; an executive team to manage and lead the research and facilitation process; and the formation of a scenario building team as an advisory group to participate in the methodological decisions and validate results; and technical groups to discuss the micro dynamics of the different sectors and specific issues to contribute to the modeling process. This structure was implemented in different ways by the different countries.

Colombia tried to institutionalise within the National System for Climate Change, an ambitious structure of governance for the whole Low Emission Development Strategy by law, but finally the decree was not approved. As a result, the strategy continued with an executive committee comprised of the coordinator of the strategy and representatives from the donor institutions, without high-level inter-sectoral coordination for the decision-making. In Peru, the Steering Committee included a representative from the Ministry of Environment, Finance, Foreign Affairs and the National Planning Centre. However, the lack of participation at the Steering Committee level of other sectoral ministries key for the implementation of mitigation actions was identified as a weakness of the first stage of the project. As a result, the Committee was reinforced for the following stages of PlanCC. Chile continued with a Steering Committee with representatives from seven ministries, including Foreign Affairs, Finance, Transport and Telecommunications, Agriculture, Energy, Mining and Environment.

Even though the participation of the representatives at the steering committees was not completely stable, their formal constitution facilitated the articulation of the project with the government. The multi-sectoral participation diminished the level of contestation of the results. This validated the argument that a continuous relationship among players contributes to establishing trust, and increasing the credibility of the results beyond their rigor, accuracy and robustness (Wynne, 1991; Wynne, 1992; Wynne, 2007).

In addition, the formation of Steering Committees facilitated the transition from the delivery of results by MAPS to the definition of the INDC in the three countries because most of the team members were involved in both. In the case of Chile, the Committee
for the INDC corresponded almost exactly to the Steering Committee of MAPS-Chile, facilitating the translation of results, and the understanding of its implications and uncertainties.

The characteristics of the executive team changed across countries, but a key element that emerged seems to be the relevance of integrating the people responsible for the development of the project and those specifically devoted to its management. It is hard to imagine that a particular ministry would have had the resources to achieve the tasks within the timeframe. Additionally, the leadership of government representatives seems critical. In the cases where there was a person from the Ministry of Environment working actively in the decision making of the process, the interface between science and policy was more robust and more efficient in articulating the different expectations between the preferences and priorities of the researchers and the obligations and relevant issues for the government.

Finally, the third key component of the governance structure was the formation of an advisory group and technical working groups. This strategy was to facilitate the process of co-production of knowledge and to provide legitimacy to the results. Technical meetings with experts facilitated in all three countries filled the gaps in information and validated the methodologies, parameters and assumptions for the modelling process. In turn, the scenario building team, as an advisory group, contributed with the same tasks but also provided support and legitimacy to the process. Not all countries addressed the relevance of strengthening personal relations among the stakeholders involved in the process in the same way. It remains a key issue to understand these processes as socio-technical processes. That means including into the evidence-building process, human relationships as a critical factor; with the aim of building a trusting and fruitful cooperation based on setting clear and legitimate rules, working with impartiality, acting with respect and truly recognising the contribution of all the people involved in the process.

1.1.3. Formation of the stakeholder groups: representativeness and technical capabilities

As already outlined above, the MAPS approach recommended the formation of a scenario building team and technical groups to participate in the process of building evidence. The formation of the groups aims to be representative of key sectors and institutions and provides technical knowledge to the process.

For all the countries, this task was challenging because of the necessity to identify who would be the most relevant stakeholders and which technical expertise would be most valuable. The basic consideration was to include people from the public sector, universities, private sector and NGOs, but these distinctions required more detail and a better understanding of the final implications of including different stakeholders and experiences.

In Peru, the case analysis highlights the problems of including the private sector. The key institutional players that participated more actively were the best-organised and usually more powerful private interests. They do not necessarily represent all the private voices. Peru faces a high level of informality and a lack of organisation to include them as counterparts. In particular, there was a lack of participation of industrial associations, especially from the mining sector and hydrocarbons. In the case of Chile, the analysis emphasised the lack of participation of NGOs and social organisations that would have contributed to higher levels of legitimacy of the results. The private sector was represented by associations from the key industries for the country’s economy (mining and energy). But the public sector included only people from the different ministries without taking into
consideration other specific institutions that play regulatory roles and that have a high level of influence in the definition of policies that can impact the lock-in of long-term processes (like the National Commission of Electricity, the National Investment System etc).

In terms of technical contributions, there is much scope to include people with the right technical expertise. Both before and after the definition of the mitigation actions, the information about the kind of expertise required was not complete; therefore as the process progresses there is an opportunity to adjust the configuration of technical groups to respond to the changing demands.

Finally, there was the question about the selection of the role players to be included. In Colombia the first meetings included high-level policy-makers and representatives from the public sector, assuming that they would provide the best contribution and lend credibility to the results. The problem was that over time it was difficult to guarantee their active and committed participation. In the Chilean case, the team focused on middle-range experts and policy-makers under a different hypothesis. They were looking for role players who could devote their time to participate in a very demanding process, including many meetings and e-mails exchanges. In some cases, those involved had the capacity to contribute valuable information and experience from their institutions and to transmit the learning achieved throughout the MAPS process to their professional activities. In other cases this positive relationship was not achieved. Finally, in the case of Peru, the focus was also to include the most influential role players as part of the working group because of the emphasis placed on political leadership in facilitating change.

There is no recipe for the best configuration of stakeholder groups. But it is important to carefully assess the expected contribution (whether legitimacy, technical knowledge, information, leadership or innovation) and the commitment expected. This last point is discussed below.

1.1.4. The value of time

In order to realise MAPS expectation of building a robust body of evidence and transform capacities to conform to a low-carbon development model; time is an essential resource. Time to build meaningful relationships, time to learn and to understand the complexities and implications of implementing mitigation actions; and to strategise about low-carbon development policies. Time to reflect and discuss the complex and technical issues and time to listen to the different contributions from the different role players. Also, it is necessary to balance this requirement for time with the urgency and demands of the public policy realm.

The three countries benefited from an unexpected outcome. They started building the evidence before the international negotiations integrated the requirement of presenting INDCs to the UNFCC. So that at the time of the INDC definitions, Peru, Chile and Colombia had most of the information required for discussing and defining their commitments. This situation was not planned but the teams were aware of this opportunity and facilitated the articulation of both processes.
Main contributions and challenges for evidence building and policy-making

1.1.1. Making climate change issues visible

The process of co-production of evidence to inform Climate Change policies presented an opportunity for opening the discussion about climate mitigation and development implications across a selected group of experts in the three countries. Researchers, policy-makers and stakeholders that were part of the MAPS Programme came to the discussion with different expertise and different levels of knowledge about Climate Change issues. By the end of the process, most of them were aware of the main subjects on Climate Change and had developed an opinion about key issues like drivers of emissions, technological alternatives and the potential economic impacts of Climate Change mitigation.

In the Peruvian case, members of the SBT identified the possibility of disseminating information about Climate Change across different sectors and to new audiences, strengthening their knowledge about the topic and increasing the awareness of the relevance of Climate Change to the country. A member of the technical coordination of the PlanCC summarised the idea saying: “the political objective of PlanCC was that of mainstreaming a policy, that the Climate Change focus becomes inter-sectoral and that it generates a platform for information and long-term thought…” (quoted at Chávez & Bazán, 2015).

Beyond the participants of the projects, the discussion and results permeated the public agendas. All three countries devoted efforts to conducting communication strategies and increasing media coverage; and were favored by the international agenda on Climate Change achieved by the COP20 in Lima and the COP21 in Paris. Over time, the teams learnt how to link development issues with mitigation on Climate Change and how to integrate the MAPS results on the sectoral agendas. However, there is still a long way to go on communication issues to facilitate the dissemination of scientific evidence. There are challenges in translating the information for different stakeholders without losing the quality and depth of results. It is necessary to explore methodologies to improve the form and contents of presentations to facilitate the communication of complex results to non-expert audiences. Moreover, it is also necessary to discuss the results and alternatives with key stakeholders, mainly parties that can facilitate the implementation of mitigation actions and change like leaders of opinion, business people, and social activists.

1.1.2. Addressing gaps in data and technical capacities

Even though the three countries had the experience of presenting their National Communications, the robustness of their GHG inventories, data and technical capacities to conduct research on mitigation was different across countries. Chile has advanced solidly in shaping a national system of GHG inventory and an institutionally validated energy balance, facilitating the modelling process. This was not the case for Peru. Even though the country has worked on building systems of information, its emissions inventory is still in progress, so it was required to build part of this basic information as part of the MAPS Programme to subsequently start the process of estimating emissions (Chávez & Bazán, 2015).

Nonetheless, for all countries, the task of estimating GHG emissions for all sectors of the economy was a big challenge. In terms of the basic inputs, the countries faced a lack of data to estimate long-term projections; difficulties finding and accessing databases from the public and private sector; and sometimes a complete lack of information. Additionally, not all countries had the same level of development in terms of technical capacities to conduct research. Therefore, the three countries faced difficulties in guaranteeing the same quality of results for all sectors. Even though there were limitations and challenges in the collation of the data, in Chile, Colombia and Peru there is a shared positive evaluation of MAPS results as the best available data.
The co-production of evidence (through the development of a governance structure for the project where researchers, stakeholders and policy-makers work together to build knowledge) facilitates the development of strategies to deal with these handicaps. The researchers involved in the process in all countries, cite the positive contribution that the participation of experts and stakeholders made in facilitating the access to valuable information to accomplish the task at hand. Members of the advisory and technical groups facilitated information that was dispersed and not necessarily systematised across the public and private sector. In the case of Colombia, they also facilitated the possibility of building evidence from the private sector to validate the data available at the state (Interview to representative of ANDI, the National Industry Association). Additionally, the integration into the modelling process of expert knowledge through a formal process of consultation to technical groups contributed to addressing the gaps in data and information.

It is to be expected that most developing countries could face similar challenges in terms of the quality of the data and the lack of systematised quantitative information. Under these conditions, a process of co-production of knowledge facilitates the integration of diverse knowledge and access to disseminate information through a structured methodology of participation by experts and stakeholders, making results more robust.

1.1.3. Making analysis suited to domestic conditions

The co-production of scientific evidence for informing public policy delivers results well suited to the national contexts for each country, because it relies on integrating local knowledge through the participation of local stakeholders and experts in the research process.

First, for long-term projections, it was necessary to set parameters (such as GDP projections) and to rely on assumptions about rates of penetration for different technologies and micro dynamics for the different sectors. If it is difficult to describe the present, it is even more difficult to project the future. This task is not easy, especially for developing countries, which must usually base their projections on global market trends and the international experiences of countries that have already made progress in implementing the measures (developed countries usually). This projection task can be greatly enriched by the calibration of these assumptions with the technical knowledge of national experts. In the case of Peru, Colombia and Chile, those who participated in the advisory groups contributed with their expertise and knowledge of the institutional, financial and social characteristics of each country. This assisted in the refining of the parameters and assumptions, to improve the modelling adjustment and to ensure the results reflected the local realities of each country.

Second, in the cases of Chile, Colombia and Peru, the MAPS Programme was originally a non-binding exercise aimed to inform public policy on Climate Change and support the countries in international negotiations. The products anticipated from the beginning included defining an emission baseline, building the scenario required by science, identifying and evaluating mitigation actions and mitigation scenarios for all sectors of the economy and assessing its macro-economic impacts. The products that seemed to be clearly defined were in fact addressed differently among countries, based on their specific interests and needs. The estimate baseline emissions for the case of Colombia was mainly sectoral, committed to the country’s interest to nurture the sectoral plans as part of the Colombian low-emission development strategy. Towards the end of the project the need arose to estimate a national emissions baseline because of the request of information by the government for the formulation of the INDC, which set national commitments for the country. A definition that was consistent with the objectives of the project at a particular
moment changed over time and generated new demands for knowledge. Thankfully, given the availability of the research and coordination of teams and the experience generated along the process, it was possible to satisfy these changing demands.

Finally, the process of identifying mitigation actions and building mitigation scenarios was clearly a science-policy interface specific for each country and facilitated by a process of co-production of knowledge. Mitigation actions were identified through international benchmarks, but finally selected because of their applicability and relevance to the specific institutional, economic and social conditions of the different countries. In turn, the methodologies for building mitigation scenarios differed across countries and the final results represent narratives about different pathways of mitigation actions relevant for informing public policy. All three countries estimated a ‘business as usual’ and a ‘required by science’ scenario. Additionally in Peru they packaged mitigation actions under the narratives of “Fast” actions, “Savings” and “Sustainability”. Chile also approached the construction of the mitigation scenarios using narratives relevant for the country – “Base, Medium effort, High effort, Non-conventional renewable energy, Renewable Energy, Nuclear and 80/20 ”, which includes the most effective mitigation actions.

The decision of which mitigation actions to include in the analysis and how to package them to build mitigation scenarios was facilitated by the cooperation of researchers, local experts and policy-makers. In the cases of Peru and Chile these reflected different levels of institutional effort, but also the possibility to analyse particular sets of mitigation actions according to the domestic policy agendas.

1.1.4. Strengthening personal and institutional capacities

One thing agreed by the interviewees from all three countries is the contribution of conducting domestic research to domestic capacity building. Even though international consultants could have performed the studies, the final impact would have been less relevant for the countries. It is worth understanding that, based on the MAPS experience, while the numbers can get outdated; the technical and methodological capacities contribute to building more knowledge in the future. All the countries demonstrated their capacity at the national level to perform the research, but most importantly, they have achieved the capacity to improve their results in the future based on the knowledge and experience achieved.

Not all institutions involved in the process had previous experience with Climate Change research. They therefore used their former knowledge applied to other research areas to estimate GHG emissions. It was undoubtedly a new research topic for an important number of researchers involved in the three countries. A positive spin-off of the MAPS experience has been the development of individual and institutional capacities mainly by local, private consultancy firms and universities that participated as researchers. The development of the project offered stakeholders and researchers the opportunity to learn about new methodological approaches, intersectoral interactions and the micro dynamics of the different sectors through the collaboration between researchers and stakeholders as members of the advisory and technical groups.

At the end of the projects, local consultants involved in the research process in Chile, Colombia and Peru evaluated their work experience with MAPS as a fruitful learning process. It was characterised as demanding work because of the high level of scrutiny imposed by the continuous presentation of their results to different experts to validate; but also as an opportunity to develop, in some cases, and to consolidate a work stream on climate issues, in others. Most of the consultants and researchers involved have used the methodological approaches learnt during the process to conduct other research and the data and results for different projects. An unexpected impact of MAPS was that the results generated by the project have resulted in different layers of
information with many potential uses. In fact, the process of building the long-term energy agenda for the Chilean government (named Energia 2050) relied on MAPS information for most of its analysis. In Colombia, interviewees state the possibility of building a network of universities and a research center to address Climate Change studies as an extension of the expertise and relationships developed in the Colombian Low Carbon Development Strategy.

An example of the relevance of domestic research and the contribution of a process of co-production of knowledge for building domestic institutional capacities is the case of the process of informing the INDC in the three countries. Both in Chile, Peru and Colombia the government asked the research teams to refine the estimations and evaluations of the mitigation actions and scenarios. In some cases, it was necessary to update information; in others it required changing assumptions based on new knowledge; or evaluating different mitigation measures. All these processes and adjustments demanded a high level of flexibility by all and a reassessment of the time required by the research process for the additional and urgent demands from the public sector.

In this transition from research results toward the policy-making process, the process of co-production of evidence was crucial to improving outcomes. The research team relied on their experience and the results to respond rapidly to the policy demands. In this process the level of knowledge achieved by the domestic research teams was critical, as well as by the policy-makers responsible for defining the INDC at the different countries. At least in Peru and Chile, the technical and political teams that participated in the definition of the INDC knew the results and process of the MAPS Programme, which facilitated the credibility of results and the coordination to generate the necessary revisions that allowed delivering evidence useful for the kind of challenge posed by the international negotiations on Climate Change. Perhaps the most representative case is Chile, where the committee for defining INDC corresponded almost exactly to the Steering Committee of MAPS-Chile, facilitating the translation of results, the understanding of its implications and the awareness about the limits, uncertainties and opportunities provided by the evidence generated.

In turn, the impact on institutional capacity building at the public sector was less relevant than the impact on personal capacities and research capacities at the country level. The project in general faced difficulties in the process of transferring the models and the knowledge to update the information and run the models without the support of the researchers outside of the state. It was possibly a lack of planning, timing issues and in some cases, lack of interest from the public sector or researchers. The fact is that the governments of Peru, Colombia and Chile will have difficulty replicating the studies performed by the MAPS Programme without the support of the researchers; even performing simple tasks that might facilitate the update of results. However, there was an important contribution for policy-makers in their awareness and understanding of Climate Change drivers, the complexity and uncertainties of the phenomena and mitigation actions. More about the learning process will be analysed in the following section.

1.1.5. Facilitating social learning

The co-production of knowledge meant opening the black box of the modelling process, making explicit the parameters and assumptions that usually are defined at the discretion of researchers; and also making plain the opportunities and limitations that this kind of research exercises offers to a better description and understanding of facts. In Chile, this step of the methodology was highly valued by the stakeholders because of the contribution to increasing the understanding of the dynamics of GHG emissions, especially for those non-experts. For the researchers, the review of the parameters and assumptions by sectoral experts provided
them with new and rich information about the microdynamics of the sectors in a more efficient and simple way. In the Peruvian case, the issue regarding the definition of assumptions for the modelling process was carefully treated and documented and discussed with members of the technical groups, where these parties assumed a function of external analysts of feasibility (Chávez & Bazán, 2015). In the case of Colombia, people interviewed stated that the process of defining the Colombian Low Carbon Development Strategy through a participatory process is “perhaps the most important (characteristic). It has helped those from the private sector to really understand how things work” (Sectoral Technical Advisor 7, cited in Lema & Tibaduiza, 2015).

At the same time, another important source of social learning was the inter-disciplinary and multi-sectoral formation of the working and advisory teams. Role players across sectors in the different countries valued the chance to learn from their colleagues at the meetings, increasing their awareness about the complexities of the phenomena and enriching their understanding of the topics. At the same time, they praised the opportunity to understand the inter-relations between different sectors and the challenging task of coordination and integration that many mitigation actions will demand. This opportunity for learning was a key incentive for the people to participate along the process.

CONCLUSIONS

The role of evidence in the policy-making process has been discussed extensively by social scientists (Shackley & Wynne, 1995; Walker, 2000; Davies, 2005; Judge & Bauld, 2001; Cable, 2003; Sanderson, 2006). While some researchers argue from a normative standpoint about the relevance of using evidence to support public decisions, others emphasise the lack of relevance of scientific evidence for the policy-making process because of the prevalence of ideologies, interests and values. In this paper it is argued that a key element to take into consideration in the policy-making processes and relevant social transformations, is not only about the quality of the results, but also about “the way we do things” as a critical dimension. This means, understanding the science and policy relationship as a social process where the methodologies applied (what kind of information is used, who and for whom the results are built and the kind of personal and institutional relationships we create) are critical issues to maximise the contribution of evidence to inform public policy. These basic concerns are particularly relevant for building evidence for Climate Change in developing countries.

Generating evidence to inform Climate Change policies based on a process of co-production of knowledge has meant an important contribution to the robustness of results and capacity building for the countries participating in the MAPS Programme, both at the individual and institutional level. The evidence generated by the studies has been crucial for defining the INDC of the countries making explicit its influence in the policy-making process.

At the same time, the experience has shown that quantitative results become obsolete very fast, faster than we expected. Changes in relevant parameters and the intrinsic limits of making projections in the long run can affect the credibility of results. Therefore, production of evidence can only make a very specific contribution in the short term. It must be understood as a process, whose ultimate purpose is to contribute to social learning mediated by the development of domestic institutional capacities. In such a dynamic and uncertain exercise, specific numbers become redundant, while methodologies and learning remain and allow countries (as in the case of Chile, Colombia and Peru) to build upon their results and respond timeously to specific challenges (like informing the definition of the INDC).
Finally, the question about continuity remains open. It is arguable that the contribution of the MAPS approach in terms of building reliable quantitative results together with building institutional capacities is an important starting point that might facilitate the discussion and implementation of mitigation actions across countries in the years to come. Also, it is probable that some of the people who participated in the process will continue to be interested in working on Climate Change issues or, at the very least, integrate mitigation to evaluate their projects. This will be more likely if the international agenda on Climate Change increases the urgency for countries to act and foster more ambitious mitigation targets. External drivers such as international pressure for global Climate Change negotiations and international finance will remain relevant in the following years. What is probably true is that all these potential situations in the near future might increase their probability of occurrence because the process of building evidence has been governed and developed with domestic capabilities by national researchers and stakeholders.
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