Building local capabilities in Guanajuato towards transparency of action in the case of climate change policy. Final Report

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Contents

1 Abstract

This report presents an instrument designed for the state of Guanajuato to collect information on the main climate related programs and courses of action at the state and municipal level, identifying staff capacities for policy formulation, policy implementation and climate change reporting. The first part of the instrument consists of a discrete choice experiment, which identifies local government's priorities related to climate change projects. The second part collects information on the administration's capacities and the status of key mitigation actions. The database that the instrument will generate, identifies the status of the main climate related programs and courses of action at the state and municipal level.

Finally, we present the design and proof-of-concept implementation of a two climate change policy dashboards (one public and one operative dashboard for policy formulation purposes), with the intention of presenting the information collected by the instrument in a policy-relevant way. The public dashboard tracks climate change-related programs at the municipality level, estimates mitigation potential in terms of additional Co2e, while the operative dashboard identifies the specific capacity-related needs to design interventions and the policy domains more promising to develop climate change programs.

Together, the data collection instrument and the dashboards will support the state government to estimate their contribution to mitigation targets and develop a system to collect and report the data, enhancing transparency climate change-related data at the state and municipality levels, improving the state's capacity to generate comprehensive reports, and increasing the state's capacity building and skills related to climate change public policy formulation and implementation.

2 Introduction

Climate change policy worldwide has moved from a focus on national policy making to a local governments framework (Cann, 2021; Milhorance et al., 2021; Valenzuela, 2014; Domorenok & Prontera, 2021; Homsy et al., 2019; Keskitalo et al., 2016). Hundreds of technical and policy reports have been developed over the last two decades to support subnational governments in their efforts to carry out climate change policy in both mitigation and adaptation (Clar et al., 2013).

In the case of the State of Guanajuato specifically, they aim to "develop capabilities among all sector of society to mitigate and adapt to climate change", a goal declared in their Development Plan 2040, a mandatory document that sets the main goals of the administration. To accomplish its goal, the state administration needs (1) to estimate the CO2e tons mitigated by specific interventions by the state agencies; and (2) to convey the method to municipalities, collect the information and verify their estimations. The latter requirement is where most efforts are needed, as most municipalities do not have the staff and expertise to identify which of their programs and courses of action have climate change-related impacts; do not have expertise on how to develop adequate climate change policy interventions; and do not have a system to measure the impact of their policies nor a system to organize their data, use them for policy design and for reporting.

The project proposed in this document aims to build a strategy to collect climate change information at the state and municipal level, identify potential courses of action to improve climate change policy and train subnational staff members at the state and municipal levels in climate change policy formulation and climate change reporting. The proposal is to instrument a demonstrative process for a selection of state agencies and municipalities as proof of concept.

Consider that Guanajuato's Secretary is mandated by the State's Climate Change Law to design and implement climate change mitigation strategies, and measure/estimate the CO2-equivalent tons mitigated in the State. Additionally, this goal is registered in the State

Development Plan 2040. Government's agencies have strong incentives to fulfill the goals stated in the Plan, as their commitments are tied to a performance-based budgeting system. By the National Climate Change Law, Mexican states report their registers to the National Institute of Ecology and Climate Change.

Climate change policy needs the coordination of many agencies at a different levels of government. Integration has been proposed as a solution to the need for coordination (Pacheco-Vega, 2021; Solorio, 2021). However, frequently climate policy integration recommendations neglect that mitigation and environmental goal face a type of dilemma that requires different policies. Common integration approaches could solve coordination problems where different policy subsystems differ in their objectives and strategies. This wicked problem cannot be solved with high-level meetings and information sharing. There are many factors that determine implementation according to Clar et al. (2013); Clar & Steurer (2021), including "a political and social environment, threats and events, change agents and a supportive framing". We have to ask what is the strategy to create the factors that could trigger climate change policy in Guanajuato. Maybe raising awareness is the first thing that should be done. Clar et al. (2013); Pulver & Sainz-Santamaría (2018) think that rather than policy integration, what governments can realistically accomplish is "providing direction and raising awareness"

Based on the analysis of 60 guidelines on adaptation to climate change, Clar et al. (2013) pinpoint a number of barriers (lack of awareness, certainty, resources and political commitment) that determine failure of climate policies, especially in adaptation to climate change. Those barriers are lack of awareness, certainty, resources and political commitment. Since these and other barriers can be overcome (e.g., by raising awareness, closing knowledge gaps, and increasing resources), numerous decision-support frameworks (mainly written guidelines) have been developed: "The barriers described above can determine the success or failure of adaptation policies. Since guidelines aim to support policymakers in developing and implementing adaptation policies, most of the guidelines we analysed explicitly acknowledge the

need to address barriers, challenges, obstacles, constraints or limitations respectively."

In consideration of the hurdles mentioned above, we aim to identify which are the climate policy actions that should be prioritized in terms not only of contribution to mitigation goals, but also in terms of political feasibility, institutional and organizational capacities. We conclude establishing which other measures need to solve specific obstacles, identifying which are technical or have some other reasons behind.

We synthesize the context of climate change policy in Guanajuato and the project strategy as follows:

- The efforts to integrate climate change policy, understood as a coordinated effort between sectors and between levels of government to design and implement mitigation policies, has failed in most countries.

- The academic literature finds that one crucial reason for actual progress is that governments accept the policy integration framework rhetorically, but in practice governments care about sector policies with concrete concerns for citizens. Climate mitigation objectives result very abstract for citizens and local governments.

- Recently, the conclusion is that emphasis should be on the co-benefits of mitigation policies, namely those concrete benefits that could be generated by mitigation policies.

- Our instrument aims to find what co-benefits are prioritized by different types of municipalities (industrial, rural). Also, we want to test whether support for climate change mitigation policies increase when co-benefits related to their specific needs are present.

- This process could signify a process of climate change mainstreaming for the municipalities of Guanajuato, with a built-in strategy to implement it.

First, we present in Section 3 our description of our policy process-based approach to build municipalities capabilities in Guanajuato. Section 4 presents the first part of our instrument, an innovative discrete choice experiment approach to identify municipalities'

willingness to implement Co2 mitigation projects and prioritization of co-benefits. Section 5 presents the instrument strategy to collect information on municipalities mitigation projects, interest in climate change, and existing capacities.

Finally, in section 6 we describe two Climate Change Policy Dashboards for the state of Gunajuato. The first one has the objective of tracking climate change interventions, estimating mitigation objective progress and enhancing the transparency on climate change to the public. The second dashboard tracks training needs and existing capacities at the municipality level, in order to support the state of Guanajuato efforts to improve climate change policy skills at the subnational level.

The instruments presented here are based on the interim report, which analyzed the current situation related to climate change in the context of environmental and urban policy in Guanajuato, using existing documents, reports and interviews with public officials. These inputs are presented in sections 7 and 8 of this report.

3 Description of our policy process-based approach to build municipalities capabilities in Guanajuato

We synthesize our approach in figure 1, which maps the three steps (data collection, relational database storing and transforming data into actionable information) that leads to the climate change policy dashboards, which are the final products the end users interact with.

In the *data collection stage*, the consulting team collects information from municipalities, using self-administered web based questionnaires or web interfaces sent to the municipalities' decision-makers through official requirements from SMAOT. Section 4 and 5 describe the specific information requested to decision-makers.

The *relational database storing stage* consists of arranging the data collection into data tables in a way that facilitates storing, retrieving the data (data queries that are used for reporting and dashboards) and visualization. Even though the design might become more
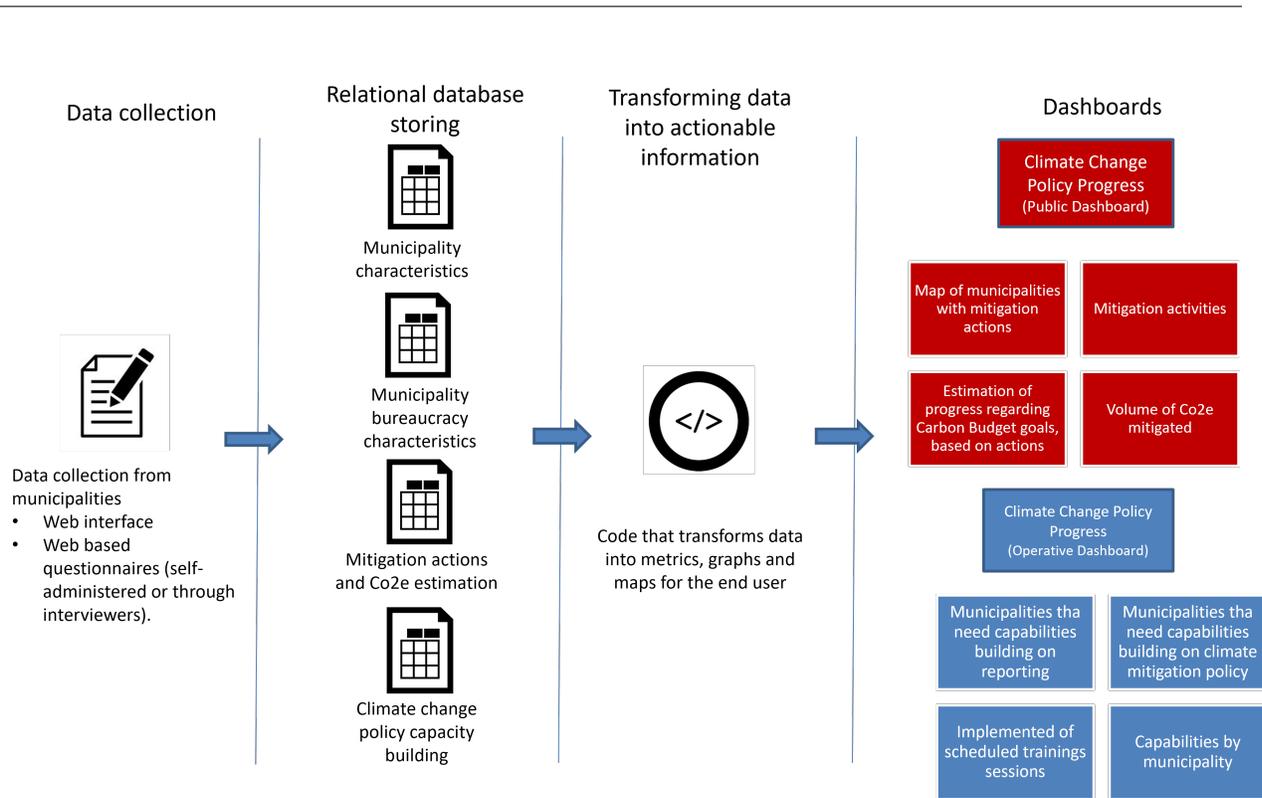
Figure 1: Conceptual description of the project

complex according to future needs of SMAOT, the current structure consists of four core tables: (1) municipality characteristics, with data collected from informants or official administrative and survey data; (2) bureaucracy characteristics, with data about the municipalities' personnel, collected from the data collection in the first stage; (3) mitigation actions, based on key actions identified by INECC (they have a core list compiled by GIZ, indicating the actions they consider priority), SMAOT and those specified by the literature; and (4) climate change policy capacity building, which compiles data on the training acquired by municipalities. The third table registers the status of each action for every municipality, indicating whether the action is either being implemented, planned, considered in a policy instrument, or if it is not considered relevant. Those actions being implemented entail the collection of additional information, based on an instrument created by INECC-GIZ.

The *transforming data into actionable information stage* consists of identifying the relevant metrics useful for the end users and writing the code to perform the adequate queries and transform them into dashboards. The *dashboards stage* considers two end users: citizens

interested in climate change will have access to a published dashboard embedded in the SMAOT website. As shown in red, that dashboard will have as core visualizations a map of the municipalities indicating mitigation actions, a list with specific mitigation actions being implemented, and estimation of progress towards mitigation goals and an estimation of Co2e mitigation. The operational dashboard is designed for SMAOT's internal purposes, allowing them to track municipalities' needs related to climate change training.

This document describes the data collection strategies and the dashboard design. Next section describes the first part of our collecting instrument: a discrete choice experiment approach to identify municipalities' willingness to implement Co2 mitigation projects and priorizations of co-benefits.

4 Identifying municipality's willingness to implement CO2 mitigation projects and prioritization of co-benefits

Our survey protocol is designed such that it accomplishes four goals. It first gathers municipal officials' expert opinion on the willingness of their municipality's residents to support CO2 mitigation projects at municipality level –let us label it *baseline scenario*. Then, our protocol tests whether municipal officials report that their municipality would be more supportive (than in baseline scenario) of CO2 mitigation projects when officials are *treated* with a narrative intervention explaining that available funding depends on municipalities willingness to commit to mitigation goals. In particular, we want to test whether such narrative intervention turns baseline unwillingness into willingness. A third goal that our protocol accomplishes is the mapping of what officials believe are the priorities in their municipality when it comes to co-benefits of CO2 mitigation. The fourth exploration that our protocol carries out is the testing whether prioritization of co-benefits changes under the narrative intervention explained above.

The design of our protocol combines discrete choice experiments (DCEs) with a split-

sample approach. Before going into further details, we first provide a brief description of the fundamentals of DCEs and split-sample approach.

4.1   Discrete choice experiments and split sample approach

Our protocol relies on a discrete choice experiment (DCE), which is one of the foremost methods in the field of non-market valuation (Johnston et al., 2017). A DCE presents multi-attribute alternatives. An alternative's attribute is meant to reflect a feature that is considered relevant (by the researchers[1]) in terms of the characteristics that respondents ponder when choosing among alternatives. In this respect, while a given alternative may realistically be described based on dozens of attributes, researchers usually settle with a maximum of five or six attributes. These specific attributes are selected based on focus groups and pilot surveys that document the factors considered by respondents when taking a decision. Each attribute is described in terms of levels. A level is a specific value that an attribute may take —see applications of DCEs to renewable energy in Martínez-Cruz & Núñez (2021) and Weber et al. (2017).

A distinctive feature of a DCE is that each alternative is described in terms of attributes. An attribute is meant to reflect a feature of the alternative that is considered relevant (by the researchers) in terms of the characteristics that respondents ponder when choosing among alternatives. In this respect, while a given alternative may realistically be described based on dozens of attributes, researchers usually have settled with a maximum of five or six attributes. These specific attributes are selected based on focus groups and pilot surveys that document the factors considered by respondents when taking a decision. Each attribute is described in terms of levels. A level is a specific value that an attribute may take. The alternatives presented through a DCE are designed in such a way that statistical analysis of reported selections allows inference of priorities of respondents.

When implementing a DCE, respondents are sequentially faced to a number of choice

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[1]In our case, the researchers determined attributes based on a workshop with SMAOT experts.

sets. One choice set presents two or more scenarios from which respondents are instructed to choose one and only one. Figure 2 in illustrates how a choice set looks like when presented to a respondent. The illustration in figure 2 reports a choice set designed as part of ongoing research of authors of this report. This choice set explores respondents' priorities with respect to their neighborhood's green areas, available parking space, greening of façade of own building, and speed and lane reduction of streets in their neighborhood.

The previous description of a DCE can be intersect with what is called split-sample approach, according to which half of respondents is presented to specific information interventions and the second half is not presented to information intervention at all. Both half-samples answer the same DCE. In this way, any difference in willingness and priorities between the two samples can be credited to the information intervention. For instance, **?** have used a DCE to explore priorities of car drivers in New Delhi for cars' features —one of which is fuel efficiency— and then used a split-sample approach to test whether informing respondents that a regulation to implement driving restrictions would increase their prioritization of fuel efficiency.

4.2 Our protocol

Our protocol constitute an instrument to infer public support of mitigation policies at the municipality level –while our application is motivated by the case of Guanajuato, it can easily be modified to reflect context across the world.

DCEs have been applied to explore priorities about climate change adaptation or mitigation measures (Kyselá et al., 2019; Ščasný et al., 2017), but to our knowledge there is not similar approach to public officials. Our implementation is closer to Alberini et al. (2006) who presented a DCE to climate experts and emergency officials.

In this application, our respondents ideally occupy an administrative position in a municipality's office in charge of environmental-related issues, and this person has hold this position or a related one for at least a decade. This municipal official is presented two

projects that could be funded with international resources that State officials are said to be negotiating. Municipal officials are asked to choose the project that, in their experience, would receive the most support from their municipality's general population and executive representatives.

Projects in our DCE are describe in terms of four attributes. Table 1 describes these attributes and their levels.
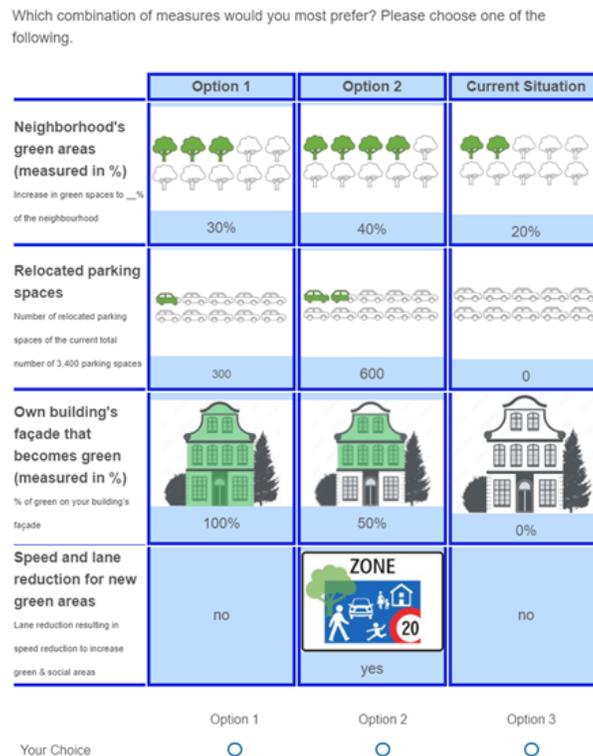

Figure 2: Illustration of a DCE choice set

The first attribute refers to contribution to climate change mitigation. We describe it to the respondents as *CO2 emissions that project would mitigate, expressed as percentage of mitigation that corresponds to respondent's municipality.* This attribute takes three levels —15%, 30%, and 60%. The second attribute refers to co-benefit for municipality's residents, and we describe it as *jobs generated by project at respondent's municipality.* This attribute takes three potential values —50, 150, and 300. The third attribute refers to project type and can take three potential values — renewable energies, solid waste management, and

Attribute	Description	Levels
Contribution to climate change mitigation	CO2 emissions that project would mitigate, expressed as percentage of mitigation that corresponds to respondent's municipality	1) 15%; 2) 30%; 3) 60%
Co-benefit for municipality's residents	Jobs generated by project at respondent's municipality	1) 50; 2) 150; 3) 300
Project type	Project type	1) renewable energies; 2) solid waste management; 3) efficiency in distribution of water
Co-benefit for municipality's administrative body	Annual reduction in municipality's administrative body's spending, expressed as percentage	1) 5%; 2) 10%

Table 1: Guanajuato's climate change policy DCE attributes and levels

efficiency in distribution of water. The four attribute refers to co-benefit for municipality's administrative body, and it is described as *annual reduction in municipality's administrative body's spending, expressed as percentage*; it takes two potential values —5% and 10%. Each official is presented to six choice sets that look as figure 3 illustrates.

The narrative intervention that is implemented to half of respondents reads as follows: *El monto final que los organismos internacionales otorguen depende de la mitigación que el estado pueda comprometer, y dicha mitigación depende a su vez de lo que cada municipio esté dispuesto a mitigar.* A translation to English is as follows: *The final amount granted by international institutions depend on the mitigation that your State can commit to and, in turn, this mitigation depends on the mitigation that each municipality is willing to commit to.*

Conjunto 1/6	Proyecto 1	Proyecto 2
Contribución a la mitigación del cambio climático	30%	15%
Número de empleos que el proyecto generaría en el municipio	300	50
Proyecto relacionado con...	Manejo de residuos sólidos	Energías renovables
Reducción en gasto corriente del municipio, expresado en porcentaje	10%	5%

¿Qué opción prefiere?	○ Proyecto 1	○ Proyecto 2

Figure 3: A DCE choice set for Guanajuato decision makers

4.3 Discrete Choice Experiment (DCE) implementation in SurveyToGo

Our DCE instrument was implemented using the software SurveyToGo, a Computer-Assisted Personal Interviews (CAPI) and Computer Aided Web Interviewing (CAWI) platform, which contains the question and randomization features needed for the implementation.

Figure 4 shows the introduction to the exercise, the first screen presented to the informant. The introduction informs the respondent that the government of Guanajuato is interested in promoting Co2 mitigation projects, in the context of the Paris Agreement. To that purpose the state government is in conversations with international funding organizations to support the projects. In the second paragraphs, it indicates that the projects may provide benefits to the municipalities, such as job creation and savings for municipal treasures. Then we indicate that their experience and knowledge is useful to negotiate the right characteristics for the projects. We ask them to choose what they think will be better for the municipality and request their consent to answer the survey. If the public official accepts to participate, the survey proceeds.

If they choose no to participate, a few questions to document their reasons are captured. We should point out that in Mexican federal system municipalities are of a different order of government from the state, but are not hierarchically subordinated to the state authorities. That means that even though national and state laws establishes a role for the state government to collect information, they are not obliged to acquiesce to any information request (or at least there is not a penalty for not complying). This means that it is key to convince municipalities that answering they comply with a coordination scheme between federal, state and municipality administration but also that collaboration with these type of projects may signify benefits for their own local government finances and provide benefits to their citizens.

Figure 4: Discrete Choice Experiment implementation in SurveyToGo: Screenshot of Introduction to the Survey

Figure 5 shows and example to train the informant to navigate the type of questions that will be presented. In instruments such as DCE it is important that respondents understand that they are comparing projects that come with a set of attributes as a package, whose

features are presented vertically. They need to understand that one package may have a better feature in a given attribute (in the example, Option 1 mitigates more Co2 emissions that Option 2) but have less advantageous features in a different attribute (in the example, Option 2 generates more jobs that the Option 1, which is better from the climate change mitigation perspective). The choice depends on their own preferences and judgments about their municipality needs. That is why the introduction emphasises the relevance for their municipality according to their experience and knowledge. In the example question, they choose just to get used to the questions that will come afterwards, which will be used to estimate which attributes are preferred by the interviewees.

Figure 5: Discrete Choice Experiment implementation in SurveyToGo: Screenshot of Example presented to the informer before the actual questions.

Finally, Figure 6 shows one of the six questions that will be presented to a particular informant. These answers will allow us to estimate the economic value of each attribute, based on the trade-offs between savings and other desirable features, as revealed by the choices of the informants.

Figure 6: Discrete Choice Experiment implementation in SurveyToGo: Screenshot of first choice presented to the informant (out of six choices in total).

5 Collecting information on municipalities mitigation projects, interest in climate change, and existing capacities

5.1 Collection of key mitigation actions: Implementation

Our instrument collects information on municipalities' mitigation policies, based on (1) the mitigation actions considered priority by the National Institute of Ecology (INECC); (2) the actions considered relevant specifically for Guanajuato as reported by experts consulted by POLEA and reported in this document in Section 7 ("Input I: Systematization of demands for climate change policies"); and (3) the policy actions and objectives identified as priority for any local government by Kalafatis (2018).

1. Generation of distributed energy using renewable sources in areas with network connection.

2. Generation of distributed energy using renewable sources in areas without network connection.

3. Using biomass for thermal, electric and co-generation in agricultural sector.

4. Energy efficiency projects for public luminaries.

5. Energy efficiency improvements in public buildings.

6. Eco-technologies projects for domestic use.

7. Energy efficiency projects for water provision.

8. Energy efficiency projects in sewage and water treatment plants.

9. New technology or infrastructure for waste waters from domestic use.

10. Fire management in forest areas.

11. Commercial forest plantation management.

12. Paymen for Environmental Services programs.

13. Agroforestal for carbon sequestration projects.

14. Soil and Water conservation in conventional agriculture.

15. Promoting compost using organic waste.

16. Public transport projects.

17. Sustainable management of municipal solid waste.

18. Adopting energy efficiency standards in industrial sector.

19. Programs to manage artisan brick making.

20. Rain havest projects.

21. Improving bicycle and non-engine transportation infrastructure.

22. Tree inventories and urban green spaces climate change mitigation programs.

23. Climate change related pollution programs.

In figure 7 we show the implementation of the questions in SurveyToGo.

It should be highlighted that *a key difference with the current practice of requesting in-formation only for those projects being implemented, in our case we request a response on the status of every key mitigation action.* The possible status for each action are the following: "the action is not being implemented and it is not consider in planning documents"; "it is not being implemented but it could be relevant for the municipality"; "there is a related project considered in a planning document of the municipality"; and "it is under
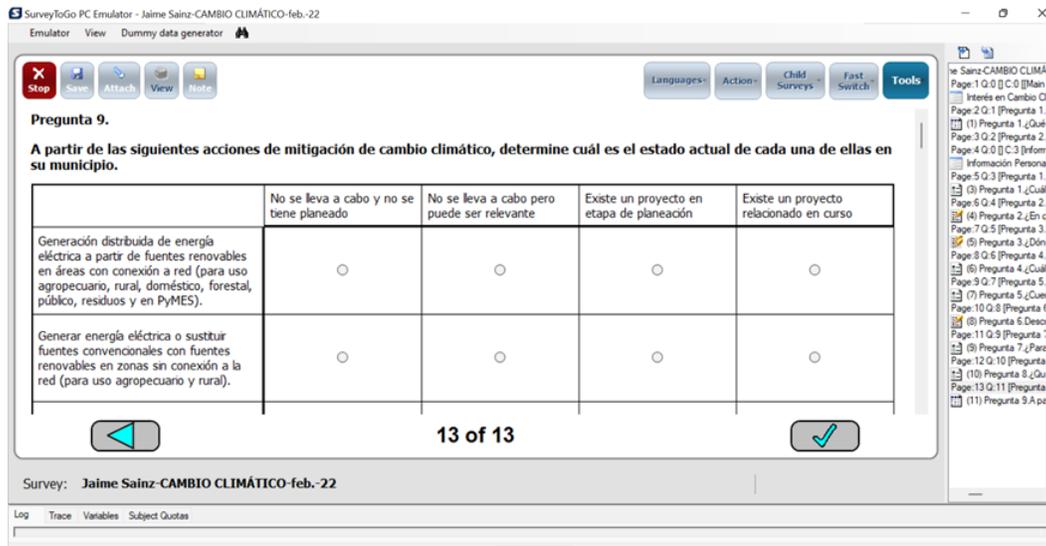
Figure 7: Collecting climate change policy information in SurveyToGo: status of key climate change actions

implementation". Every status implies a different action from SMAOT. If there is a project under implementation, specific information will be requested, as required by INECC, using the new Semarnat-INECC-GIZ platform. If it is considered but not implemented, that indicates an opportunity to increase capacities and provide training to develop that opportunity. Currently, for national reporting purposes, only implemented projects are considered. For developing climate change policies at the state level, the approach described in this report collects valuable information for SMAOT policies.

We expect that asking public officials about the specific status of selected mitigation actions, together with the findings from the DCE, help us to find which actions are a priority based on having co-benefits specific to each site, that are politically feasible and that are could be implemented under the institutional settings available in a given municipality.

In addition to the status of every mitigation action, basic information about the informant is collected, such as school years, as shown in figure 8.

Also, following Alberini et al. (2006), we collect perception of the informants on the perceptions of informants regarding climate change effects, to analyze whether decision making at the municipality level is related to socio-demographic characteristics of the informants,
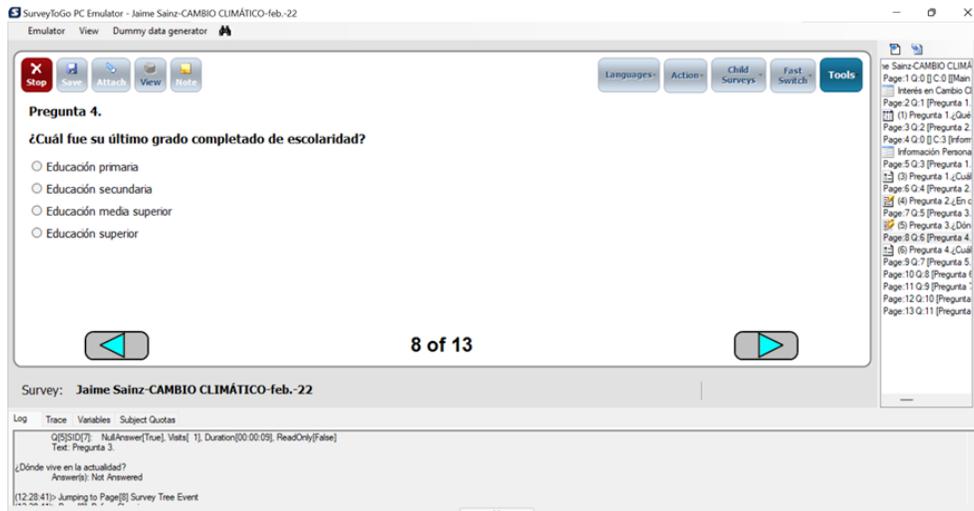
Figure 8: Collecting climate change policy information in SurveyToGo: basic sociodemographics

knowledge and perception regarding climate change effects, and municipality characteristics.
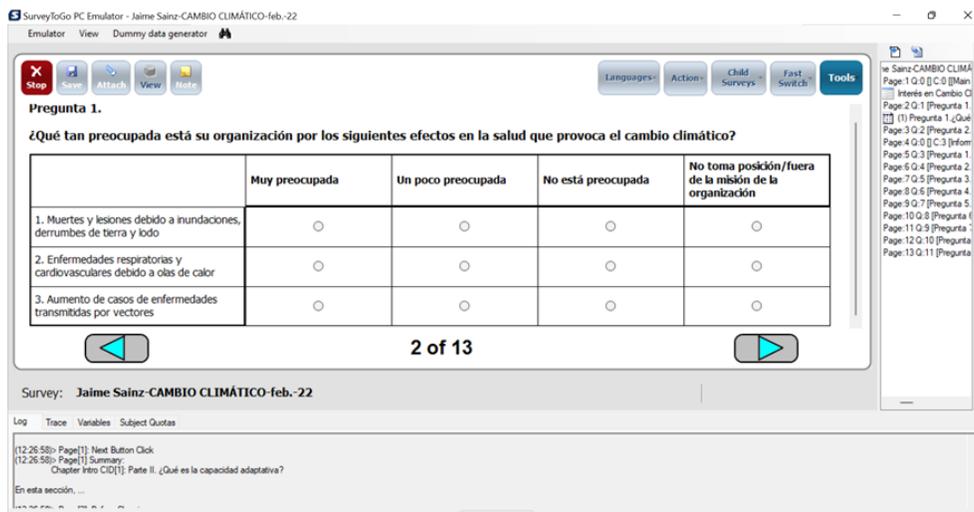
Figure 9: Collecting climate change policy information in SurveyToGo: Perceptions of relevance of climate change to the municipality

For those action under implementation, it is important to point out that the information collected by the Semarnat-INECC-GIZ plataform solves reporting needs, but further action —such as implementing internationally funded mitigation projects— require further information. While an implementation of an integral assessment of the requirements needed for that goal are beyond the scope of this project, in the next section we include a general guide

with the information to be taken into account, as part of further development of SMAOT strategies to build a strong climate change mitigation policy in Guanajuato.

5.2 Principles for tracking funding-relevant mitigation activities

A key step in building local capacities to track mitigation activities with purposes of obtaining funding, is establishing common principles for monitoring and tracking of projects. These principles are considered bu authorities and multilateral banks funding social and infrastructure projects. In this section we describes the guidelines used by international organizations and make suggestions to include them in the Guanajuato system.

The principles reviewed here include definitions, guidelines and eligible activities that make possible accounting and presentation of coherent reports of financial flows of projects aspiring to climate change mitigation funding. These guidelines follow the principles of the Multilateral Development Banks´ Climate Finance. [2]

This is relevant since 2019, multilateral bank committed to increase its climate change funding to repreesent at least USD\$ 65 thousand million in total, with USD\$ 50 thousand million for middle and low income countries. This commitment seeks to align their operations with the Paris Agreement [3].

This climate-related commitments from the main financial institutions of mitigation actions represent a strong incentive to the homologation of actions monitoring and tracking guidelines at the national and subnational levels.

In this document we include three sections. In the first one we include common definitions for the classification of mitigation activities, in the second we describe the principles and recommendations for their implementation and the last one we discuss eligibility and exclusion criteria.

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[2] Joint Report on Multilateral Development Banks´ Climate Finance.
[3] The MDBs' alignment approach to the objectives of the Paris Agreement: working together to catalyse low-emissions and climate-resilient

5.2.1 Definitions and classification of actions

An activity can be classified as a mitigation activity when it avoids, reduces or increases the sequestration of GEI or short-lived climate forcers.Mitigation action contribute substantially to the estabilization of GEI concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system, consistent with the long-term temperature objective of the Paris Agreement.

The Common Principles of the MDB recognize that a substantial contribution to climate change mitigation may imply one of the three following categories:

1. Activities that generate negative or very low emissions: actions that are clearly coherent with the long-term temperature objective of the Paris Agreement, such as carbon sequestration through land use management or some forms of renewable energy.

2. Transitory activities: activities that have positive emissions but are important in their contribution to a carbon neutral economy, for example, improvement of energetic efficiency in the processes that use directly or indirectly fossil fuels. These are recommended when there are not available technologically or economically feasible alternatives that generate very low emissions. These activities meet norms, parameters or thresholds for GEI or overcome substantially the expected results of a given sector or activity. These activities do not lead to a blockage or lock-in towards actions intensive in GEI.

3. Support activities: measures to allow that other actions may contribute substantially to climate change mitigation, such as the production of technologies with very low emissions. These activities do not impede the development or deployment of very low emission activities and do not produce blockage or lock-in towards actions intensive in GEI.

5.2.2   Principles and recommendations for aplication

To the extent that specific methodologies and process to align government action with the Paris agreement develop, we recommend that municipalities follow the following principles and recommendations for funding and accounting traceability of mitigation projects:

Consistency: It refers to use of data, methods, criteria and assumptions that allow substantive and valid comparisons of homologated projects. [4]

This principle requires the use of standardized emission factors in cases where the measurement or direct estimation is not possible. Methods use for monitoring, verifying and data storing should be consistent during the project to warrant comparability and verification.

Conservatism: This refers to the use of assumptions, values and procedures that yield conservative estimations when uncertainty is high.[5] the objective is to avoid over estimation of mitigated GEI.

Avoid double counting: Double-counting the same mitigation action might happen when two parts claim the same action or when more than one action co-produces a given volume of mitigation but the reporting claims the units of emission for every action (double emission). [6]

Mitigation actions should provide exact coordinates of the project. This will improve the capacity to identify double registries.

Transparency: It refers to the need of providing clear and sufficient information to evaluate credibility of the project. [7]

Each mechanism should provide public access data o account for mitigation activities, baselines, possible leakage, types of GEI addressed and information on how the project is monitored and implemented.

Other important principles include **granularity** (disaggregation of all the activities in-

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[4]The GHG Protocol for Project Accounting.
[5]Common principles for climate mitigation finance tracking.
[6]Addressing the risk of double counting emission reductions.
[7]The GHG Protocol for Project Accounting.

cluded in the project) and **complementarity** (including project compatible with othe sustainable development goals).

6 Climate Change Policy Dashboard for Guanajuato: Tracking Progress and identifying needs and capabilities

6.1 Policy-relevant dashboard design principles

A smart dashboard consists of a set of metrics (presented as graphs, tables, and maps) focused on telling a story with data to a specific audience. Based on international experience that respond to specific public policy needs, we build a dashboard useful for policymakers to visualize relevant trends on those topics where they are competent; provide information for report elaboration; allow transparency data for citizens and provide data that inform policy design.

In a nutshell, a dashboard pretends to provide inputs for decision-making. To fulfill those functions, the dashboard should answer specific questions, related to an action from the dashboard users.To do that, we need to identify the flow of information throughout the local climate change policy.

Based on a review of international cases centered on informing the public policy process, we adopt the following definition of smart dashboard: it is a selection of metrics (communicated through graphs, tables, and maps) focused on telling a data story focused on a specific audience (Fegraus et al., 2012; Matheus et al., 2021; Kitchin & McArdle, 2017; Karami et al., 2017).

The objective of a dashboard is to generate useful inputs for decision making. To accomplish such objective the information it provides should inform specific questions from the policy process actors. That is, each metric should be linked to a need related to an action

that the user needs to perform.

According to Matheus et al. (2021), the uses of a dashboard include the following: to understand a problem in a clearer or more intuitive way; visualize trends associated to problems, pressures and actions; report on the state of a sector (to make reports); make information transparent to the public. Matheus et al. (2021) also point out political and strategic benefits, such as immediate visualization of key variables for a given actor; choose the detail when needed; make key information transparent to the public; they are oriented to the user/client; improves decision-making and help the process to be timely; mobilizes experts and activists interested in climate change; discloses information for external users; creates informed deliberation if the information is used by journalists, activists and citizens in general.

To avoid an inadequate use, dashboards should be careful about bad quality of data, fragmente responsibility regarding the use of data, lack of capaciy to adapt to circmunstances; lack of staff or training to maintain the dashboard; bad intepretation of data; lack of trust in the information; lack of maintenance; lack of use.

A strategy to respond to such demands is linked directly with state Plan to "develop capacities among all sectors of society to mitigate and adapt to climate change". Overall, a dashboard aims to consolidate the public policy process at the state scale:

1. Tracking and organizing interventions that are related to climate change at the state and municipality level.

2. Train a set of key members of state and municipality level in the elaboration of reports and policy communication and their results in terms of co2.

3. Develop a data collection strategy and organization of state and municipal sources, to report progress regarding emissions commitments to INECC and communicate results to governments, dependencies, industries and citizens in general.

4. Enhance transparency related to data on climate change at the state and municipal

level.

5. Improve state capacity in terms of improving state capacity on report generating for the National Inventory of Greenhouse gases through the monitoring of information produced by state and municipal governments.

6. Building skills and tools for key members of state and municipal administrations, in terms of policy formulation and adaptation for municipal governments. At the state scale: communication strategies to align state policy with the needs of municipal authorities.

6.2 Implementation of dashboard in local host

In this subsection we present a selection of the information we include in our instrument. It is important to consider that the data-collection will be carried out during May and June, and therefore we simulated responses for a selection of municipalities in order to visualize some of the operative dashboard functionalities. Currently, the dashboard is hosted in a local server, and designed in php and javascript (as shown in figure 11) but once the functionality is tested the objective is to host the platform in the SMAOT website, using SQL standards.

For the case of the operative dashboard, the responsible for managing the platform will access using an username and password, as shown in figure 10.
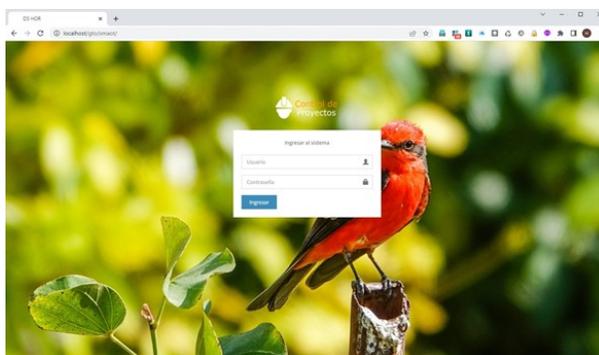

Figure 10: Climate Change Policy Dashboard: Login for operative dashboard
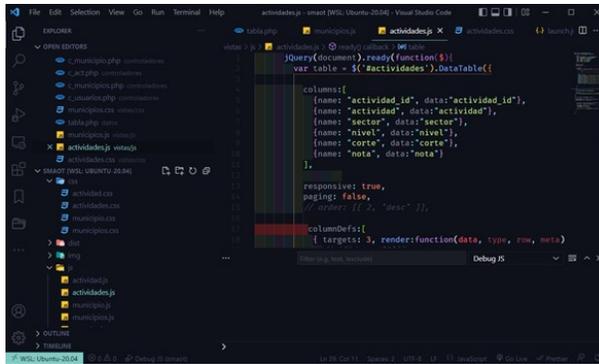
Figure 11: Climate Change Policy Dashboard: Snapshot of design in php and javascript

6.2.1 Tracking municipalities' policy instruments

The progress of climate change policy at the municipality level does depend of a set of factors, including the streamlining of climate change objectives in the core policy planning documents of the municipality.

We track whether climate change (see 12) is mentioned in the following policy document at the local government:

- Municipality Climate Action Program (PACMUN)

- Municipality Development Plan (PNM)

- Land Use Planning Plan (POT)

- Ecological Land Use Plan (POET)

- Water related investment plans

- Waste management related plans

- Public luminaries related plans

- Other relevant policy plans

The tracker will identify the relevance of climate change strategies throughout the main policy documents for each municipality. Green indicates climate change is considered, red

Figure 12: Climate Change Policy Dashboard: Tracking Municipalities' Policy Instruments

indicates climate change is not considered and gray indicates not information is available. As in the previous examples, the data shown is simulated to illustrate how the dashboard will look when populated with the actual data.

6.2.2 Tracking municipalities' mitigation actions

The dashboard will allow SMAOT to track the information available for all key mitigation actions. For illustration purposes, we show in figure 13 the list of mitigation activities for a given municipality. Each row will show the mitigation activity, the sector it belongs to (as assigned by the researchers; SMAOT may add other relevant categories useful to classify the data), the status (red indicates the action is not considered, yellow that it is of interest to the municipality, and green indicates it is considered but not implemented yet, the number of leafs and green indicate a project is under implementation). It shows also the date the most recent data was collected.

An useful way of tracking an activity is to find which municipalities have a given level of progress regarding that specific action, as shown in figure 14. In that case, we can visualize other relevant variables associated to the municipalities (in the example we included actual

Figure 13: Climate Change Policy Dashboard: Tracking Mitigation Activities

population of the municipality, according to the General Census 2020).

A relevant visualization tool of the platform is the feature of mapping chosen variables. In figure 15 we show a choropleth map representing the (simulated) number of mitigation activities per municipality.

Additional features and visualizations will be added during the process of data collection, testing and deliberation with users of the dashboard.

7 Input I: Systematization of demands for climate change policies

It is not straightforward to determine a small set of actors that drive the demand for climate change policy in Guanajuato. There are many actors from national, state and local governments; also from the government and civil society. An important entity is the Inter-Secretariat Council of Climate Change of the State of Guanajuato (COCLIMA), which is constituted by prominent members of the main secretariats of the state of Guanajuato and is in charge of coordinating climate change policy in the state.

Figure 14: Climate Change Policy Dashboard: Tracking a Specific Mitigation Activity Across Municipalities

Also, it is visible that the crucial change agent in the state is the Secretary of Environment and Land Use Planning (SMAOT), as head of the sector and responsible for develop existing climate change policy instruments and create new ones. The institutional development of SMAOT has increasingly augmented the importance of climate change within the state government. As part of the transition from Institute of Ecology to Secretariat of the Environment and Land Use Planning, they created two sub-secretaries, one in charge of natural resource management and land use planning, and a second one in charge of climate change and energetic sustainability. The latter has a General Directorate of Climate Change and Energy Sustainability. They have built a network of international cooperation, including International Development Bank (IDB), which as funded three projects, GIZ has also funded projects, and they have worked with th Climate Fund. Those international collaborations has granted SMAOT access to international know-how on climate change policy.

With the help of their international network of collaborations, SMAOT has concluded that the approach to formulate successful climate change policy is to make clear to other state agencies and to the municipalities that mitigation and adaptation interventions have very important co-benefits for the citizens, and therefore public policy in general could
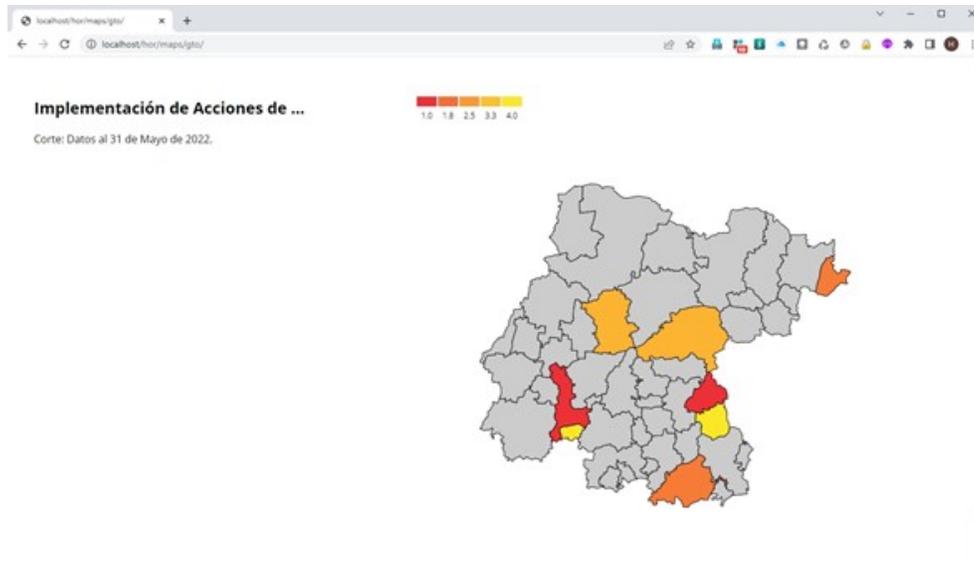
Figure 15: Climate Change Policy Dashboard: Mapping number of mitigation activities under implementation

be guided by a concerted effort to harmonize urban, environmental and climate policy in the state. In order to accomplish the objective of systematizing the specific needs of the state and their perspectives on public policy instruments, a key input for later requiring additional information from municipalities, we organized the existing information on the state of environmental and climate policy in Guanajuato from existing planning documents (INECC, 2018; de Guanajuato, 2019; de León, 2019); in depth interviews with key SMAOT members; a document of climate change proposals and challenges at the municipality level by SMAOT (2021); and a recent study elaborated for SMAOT by POLEA (2021) with dozens of actors from the government, society, and businesses. POLEA (2021) generated a qualitative report by Polea on the Law of Climate Change of the State of Guanajuato and its Municipalities (LCCEGyM), which used participating workshops and in-depth interviews to compile information on climate change related problems and policy, with the purpose of develop a legislative initiative to reform the LCCEGyM. In this section we organize all available information to discuss what is relevant for the purposes of improving the policy formulation process and the information flow to strengthen the transparency capacities of the state of Guanajuato, through the coordination of the state and municipalities governments.

7.1   Capacity building needs

Public officials agree on the relevance of clarifying agencies in charge of design, formulations and implementation of climate change policy within the SMAOT. Also, there was a consensus on the need of building up the capacity to deal with climate change mitigation and adaptation, and natural disasters. Much is expected from COCLIMA and other councils in charge or harmonizing or articulating policies, but there are municipalities that do not have an environmental area. Even the data on which installed capacity regarding environmental policy is available would be a contribution. Academic may work processing data, which is an underdeveloped capacity in many local governments, and more importantly, they have the capacity to generate evidence on what works and what does not to mitigate GEI. Activists and workers from civil society think they are able to contribute producing information and proposing alternatives, but they feel they are not considered by governments POLEA (2021).

A concrete informational proposal is a creation of good practices at the municipal level POLEA (2021). Some think that a healthy competition on what municipality developed an effective or interesting environmental policy could be an incentive for developing climate initiatives.

7.2   Information and transparency needs

Among the recommendations to reform the Law of Climate Change of Guanajuato produced by POLEA (2021), informants stated the importance of making mandatory the flow of information related to climate chance (public policies, programs, projects) from the municipalities and state agencies to SMAOT. The analysts asked 'How does the legal attributions within your agency could have an impact on the climate change agenda?', and specifically they requested an answer for a set of needs, goals, and processes. The first need was directly related to this project: 'the need to consolidate and develop information systems that inform decision-making related to climate change and to the design and formulation of public policy based on evidence.' Also, they mentioned the process that here we classify as policy

integration and policy coordination: 'the climate change mainstreaming, understood as the link between the climate change policy agenda and agendas such as food and agriculture, natural protected areas, water management and energy.'

While the State Program of Climate change has a set of planning instruments, strategies and actions, the informational foundations are minimal. The Greenhouse Gases Inventory has not been updated. It is clear that even though there is very valuable information, there is not clarity and a clear system too understand the interventions and their impacts. There is ambient data, some limited information on implemented programs, emission estimations, and even projections based on variables such as population and economic development. However, some of the information is not updated, and there is not clarity on the connection between programs and emission results. On general terms and based only on the existence of planning instrument in the state municipalities (climate action programs, state climate change strategy, GEI inventory, Risks Atlas, state law on climate change, climate change rulings, state inter secretarial commission, state council, climate change fund and coordination covenants) Guanajuato ranked as 'low accomplishment' regarding climate change regulation according to a study by Jiménez & Vázques (2020).

A salient case among municipalities is the case of León, where the Centro Mario Molina updated a GEI inventory with baseline 2017 and worked on a Climate Action Plan (de León, 2019).

7.3   Climate policy integration as a strategy for public policy formulation and planning in Guanajuato

There is an interest, common in other cities worldwide, to integrate public policies guided by principles of sustainability and climate change objectives, including zero carbon goals, using instruments such as results-based budgets to accomplish it (Solorio, 2021; Clar & Steurer, 2021). A constant message was the need to "articulate the climate change agenda to the strategy of investments" POLEA (2021).

One of the most frequent policy actions was related to strengthening mechanisms of co-ordination and collaboration between authorities of different areas and levels of government, and with society. Constantly, informants talked about the need of *transversalizing* public policy and developing multi-sectoral policies. Case in point, the expect that risk management is articulated with climate change policy, and that both policy issues are addressed coherently in the regulation of civil protection and land human settlements. This effort to develop multi-sectoral, multilevel climate policies is one of the objectives of COCLIMA.

The overreaching goal of climate policy integration and environmental policy integration in general is to design coherent interventions. For instance, urban planning, water provision, and climate policy should design coherent and articulated policy instruments. However, currently, the approach is sector-centered, driven by the specific goals of every agency head of the sector. In an ideal world, there should be coordination between mitigation and adaptation policies, and other sectors could be harmonized based on the co-benefits created by climate change policy.

Informants have confidence in formal collaboration between agencies to implement green infrastructure projects. The question is whether coordination may emerge as expected from a legislative initiative. Without funding and without acknowledging trade-offs, regulations may not produce the behaviors an results people expect. A similar problem appears in the case of lack of legal observation by municipalities, often attributed to lack of political will. The use of political will as a concept is problematic. Usually there are structural reasons that explain that lack of political will: lack of knowledge, lack of resources, interest groups exerting pressure, and other priorities, among others. According to the diagnostic, the response is different. A related problem is that municipal administration last often three years only, producing lack of continuity of environmental projects. Public information of commitments, problems, and progress cannot overcome an obstacle that is related to political institutions, but at least may help to strengthen citizens elements to demand continuity with those efforts that they consider valuable.

A very important point is that the specificity of every municipality needs to be taken into account. As mentioned by an informant, in Celaya for instance is important to deal with odors issues –an unregulated topic– while in Salamanca there is a noise issue POLEA (2021). Are there mitigation policies that could have reduction of noise in Salamanca or odors in Celaya?

In the following subsection we address key climate policy integration concerns related to specific sectors.

7.3.1 Transportation and air quality

Many of the informants were stunned by the lack of coherence and coordination and attributed it to lack of political will POLEA (2021). Some acknowledged that there are trade-offs that make difficult that just with an integral policy approach based on intelligent planning the policy process will change. An informant highlighted that it is fine to discuss zero carbon goals, but it has to be acknowledged that Guanajuato has a very important car industry, that has mining, and an exporting agro-industry as main economic sectors. Climate change policy should be tailored to those economic structural conditions. In other words, how can we integrate or even coordinate without acknowledging the clash of interests? Realistic perspectives in general recognize the difficulties of implementing serious climate change mitigating actions in a state under an orthodox policy of industrialization driven by the car industry and a demand for urban infrastructure for cars.

Such is the case in the most populated municipalities. A car-centered economic strategy is still prevalent in Irapuato and Salamanca, where highways, tunnels, viaducts and other car infrastructure absorbs most investment in public urban infrastructure. Concrete sustainable policies is related to more modest actions such as renewing public buses units and trying to promote public transportation, but in a very limited way. As concluded by an informant: "In Guanajuato, automobiles are idolized" POLEA (2021), referring to their role as an industry and the importance for drivers and their centrality in public investment. The use of cars

has weak limitations, even though air pollution is perhaps the main environmental concern, there is not a program limiting driving (as the infamous No-Circula program in Mexico City, which prohibits circulating once a week) and there is very poor control of the emissions of cars.

Informants that agree on the relevance of cars point out to what has been found in other countries: climate change and environmental policy in general, is incremental rather than based on audacious deep changes. Among the possible incremental changes are the improvement of public transportation, acquisition of modern bus for public transport, programs of public infrastructure such as 'whole streets' and other road improvements for pedestrians (gardens, medians, linear parks among others) POLEA (2021). This is not centered on specific mitigation targets, but it is related to urban sustainable development and the goal of improving the city for walking, biking, and public transport.

Stronger alternatives related to climate change mitigation involves municipalities where electric vehicles are possible. There is some progress at least in a stage of designing. Specifically in the municipality of León, they can take advantage of their progress as a pioneer nationally in public transport design.

A clear co-benefit of effective mitigation policy is air quality. Greenhouse emissions and air quality is one of the key issues in the biggest municipalities, mainly León, Salamanca and Celaya due to their industrial activity and informal brick making.

7.3.2 Energy

A key policy sector is the energetic. In this case the challenge is that the federal government plays an important role and has opted for fossil fuels. While this reduces available resources and important leadership usually provided by national experts and federal government, it increases the relevance of subnational governments to sustain the transition to renewable energies. The state of Guanajuato has invested in wind energy parks and has as an objective also to combat energy poverty using clean energies. SMAOT in particular has worked on

solar heaters and solar cells at the domestic level, with result evaluations available.

In Irapuato, they invested 50 million dollars (a big amount, considering the budget of the municipality) to upgrade their luminaries, creating an important reduction in GEI POLEA (2021). Those efforts need to be enhanced and diffused to other municipalities. Also, it is important to have a good accounting system to keep track of the mitigation policies.

7.3.3   Waste management

Due to the municipalities constitutional attribution of waste collection and disposal, Integral Management of waste in coordination with the state government is a nodal case of collaboration that could render mitigation results and co-benefits that are of great relevance for citizens.

Most municipalities have open dumps and just a few have adequate landfills. The state could lead in the development of plans for integral management of waste. According to an interviewee that have accomplished 16 out of 46 municipalities. Innovations at the municipality level should be detected and disseminated in the rest of the state. Waste management programs could produce important mitigation in term of methane and also clear co-benefits for citizens. With the exception of León, where they have a co-generation plant, there is not much progress in the rest of the municipalities.

7.3.4   Water management

Regarding water management, a recurrent instrument are rainwater capture systems. These are said to fulfill water demand at a local scale and also to reduce the use of energy to pump water by public pipelines. Informants argue that the water agency (SAPAL) should implement such systems to obtain cost reductions from energy savings. Although this type of proposals are mentioned very frequently, there are not cost-benefit analysis that show this is a cost-efficient or cost-effective measure. Another problem is the misuse of wastewater treatment plants. Some municipalities build these plants but is common that due to energy

costs and the lack of a market to commercialize the water, they stop to use the plants. Informants think that it is a problem of coordination between the Water Commission (CEAG), the water agency (SAPAL) and the federal government Water Commission (CONAGUA). However, this problem is likely to be related to misalignment if economic incentives. It is cheaper to buy water in informal markets from illegal wells or from agriculture concessions.

7.3.5 Carbon sinks and urban green spaces

Reforestation is one of the responses to climate change, as forests work as carbon sinks. However, reforestation needs certain types of species and a program that tracks trees development. Most programs focus only in the number of trees without evaluating its effect on mitigation.

In urban areas, tree maintenance is an important problem in most cities, where trees are affected by mistletoe and other plagues. Given that it does not immediately affects aesthetics and there is not expertise in many municipalities, this problem is very extended. According to informants, in municipality of León there is a large percentage of trees affected by plague, affecting soil quality and losing mitigation capacity within the city POLEA (2021).

Some are proponents of the state mandating municipalities to have plant nursery. Municipalities need to use trees as nature based solutions against dust storms. In municipalities where this is identified as a demand, there is a co-benefit from using trees as carbon sinks. In order for this to work, municipalities need training on how to build their vegetable palettes, to avoid the use of exotic species instead of endemic trees that have greater probability of surviving and of contributing to climate change and co-benefits for the citizens.

7.4 Development of policy instruments to address climate change

There is an intent of innovate regarding the development of climate change instruments, including participation and collaboration from citizens, to have an impact on local government's policy agendas. Some of the efforts should be regulatory. They stated the need of a

ruling articulated with the LCCEGyM. Informants mention that many officials are not even aware of the LCCEGyM, and point out that even though there are many regulated activities, there is not regulator in charge of monitoring, there is not an agency that sanctions. In synthesis there is not an agency in charge of oversight and enforcement, resulting in a very weak legal framework for climate change.

As explained by Casado-Asensio & Steurer (2016, 2014); Clar et al. (2013) after a review of many cases worldwide, regulatory interventions need a strong consensus. An opportunity to find out contributions to mitigation at municipalities is the consumption of energy at the agriculture sector, where according to an informant 23% of the energy is consumed. While most programs are at the federal level, municipalities have some programs that could contribute towards sustainable production of food. As usual, investment in more efficient irrigation is favored by public officials and producers, but as shown in many countries including Aguascalientes in the same region, there are other policy alternatives that do not require big federal or state investments, but need political negotiation and regulatory changes Sainz-Santamaria & Martinez-Cruz (2017). Producers prefer alternatives that involve matching funds and credits to promote renewable energy. While this is an important part of the portfolio, programs cannot depend exclusively of subsidy based interventions, as such an strategy is not financially feasible.

Related to heaters and other domestic appliances, there is an opportunity to work also with small businesses that use energy intensively. In the case of domestic solar heaters, the more than 100 thousand households that used them mitigated GEI but also generated important savings. Disseminating this information to households and businesses using behavioral policy instruments could be effective.The discussion in this case is the policy instrument to accomplish a transition to foltovotaic energy. Usually a combination of regulatory and economic instruments is more effective than a single instrument alone.

In the case of waste management, informants propose educational campaigns to divide types of waste. There is an opportunity to use economic instruments and behavioral policies

that go beyond information issues that have not had great impact where implemented. It is crucial to diffuse practices that are known within the state. Guanajuato has a program to collect electronic waste. Collection and final disposal was according to an interviewee a hard task to manage, and it could be applied elsewhere in the state where it is considered an important problem. We can ask if they know and if they are interested in some of the innovation within the state.

As in other policy issues, public officials could discuss advantages of disadvantages of different policy approaches to accomplish their objectives. Waste collection for instance could be regulated with specific regulations for new real state developments, but could be also addressed with voluntary programs or economic instruments.

There are innovations such as the transfer of treated water by industry to schools, as sometimes businesses have excess water. The question is how to accomplish this. A regulatory instrument could not be the most cost-efficient way. There are instances of capturing rainwater that have proved to be cost-efficient for specific industries. This should be diffused to other firms. Currently, Guanajuato's regulation includes planning instruments such as land use planning and urban development. A key document is the State Program, of Urban Development and Land Use Planning, and an objective is that the municipalities work also in their respective planning instruments. The opportunity is to harmonize those policy documents with climate change objectives.

An existing source of funding is the Fund for the Improvement and Environmental Descentralization of the State of Guanajuato (FOAM) (POLEA, 2021). This fund is financed from vehicle verification fees and it is supposed to be used for environmental, water or land use planning projects, in most case for municipalities. According to an informant, spending has been mainly the acquisition of basic equipment, and therefore there is an opportunity to use it for concrete climate change projects. Other funds could be financed by fees and fines; the problem is that some are managed by municipalities without clear rules on how to take advantage of the funding for environmental purposes.

Co-benefits as a strategy to attract municipalities to climate change policy. Identify relevant co-benefits and train on climate change related to those. Instrument: willingness to participate given an interesting co-benefit rather than environmental awareness or even financial appeal.

An informant pointed out that beneficiaries of climate change policy are often invisibilized, specially children; also, some beneficiaries do not how programs work and what are the benefits for them POLEA (2021). This means that there is not a political base that supports the long-term viability of the programs.

A very interesting idea is to generate administrative data useful for tracking mitigation and adaptation policies. Also, they purpose to take advantage of the expertise at the national and state level with the National Institute of Statistics and Geography (INEGI) with environmental indicators. For evaluation purposes, it is clear how to use individual-level administrative data to track adaptation policies, but it is not apparent which would be administrative data useful for mitigation policies.

8 Input II: Climate change planning in the municipalities

Out of the 46 municipalities in Guanajuato, 19 have less that 50,000 inhabitants. These municipalities are characterized by having low budgets and limited human capital to address climate change policies. In contrast, there are 10 municipalities with more than 150,000 inhabitants –starting with populous León, with more than 1'700,000 people only in the municipalities boundaries, followed in descending order according to its population by Irapuato, Celaya, Salamanca, Silao, Guanajuato (capital city), San Miguel de Allende, Dolores Hidalgo, Pénjamo and Valle de Santiago– with growing industrial activities (or salient touristic and real state industry such as in the case of San Miguel de Allende) and characterized by complex governance arrangements to attend a diversity of policy demands.

Using a review of municipal development plans, vulnerability studies, climate change documents and a diagnostic by SMAOT (2021), we identify the public problems that we will use to identify which co-benefits represent more interest to municipality public officials in the second phase of the project.

8.1   León

According to a diagnostic by SMAOT, key concerns identified by the citizens and government officials is an island of heat phenomenon; deficient air quality from cars; industrial activity and informal brick makers; water pollution from waste; and mobility issues. Together with the prediction of more frequent drought and reduced precipitation, the urban and environmental public problems in the biggest city of the state might facilitate the awareness of public officials towards climate mitigation interventions. Also, León and Guanajuato as the capital state have the strongest institutional capacity and social capital within the public administration.

8.2   Irapuato

According to a diagnostic by SMAOT, Irapuato risks associated to climate change are islands of heat problems, floods, drought, wildfires, and cold waves, and an increase in temperature.

Even though the institutional development is one of the most advanced in the state in accordance with its population, there are important lags in environmental regulations. An informant for (POLEA, 2021) mentioned that the environmental law is 26 years old and an overhaul has been discussed for many years without important improvements: 'in operative terms, we live in 1995 for regulatory purposes'.

8.3   Guanajuato

As the capital city, it is perhaps the municipality with the most trained human capital within the government together with the municipality of León, which results in abundant policy instruments related with land use planning and environmental regulations. However, there are important lags even in this municipality, such as the lack of an Climate Change Action Plan.

9   Conclusion and next steps

The United Nations Framework for Climate Change has produced clear technical guidance for producing actionable information for developing climate change policies. At the country level for instance, and directly related to what we have discussed in this report, the Katowice package provides governments with detailed guidelines on co-benefits identification, capacity-building, mitigation and adaptation activities, effective communication, building of transparency frameworks, among other topics. While the guidelines are centered on Nationally Determined Contributions, the guidelines are useful for subnational governments. The existing gap is on how to link such abundant information and guidelines with specific municipalities needs and demands, and how to overcome the hurdles that constantly appear at subnational governments that are under-staffed and have under-developed information systems.

   With this project we aim to contribute to to collect information on needs, potential demand for mitigation policies based on co-benefits, and likely obstacles due to limited staff and institutional settings.

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