

ANALYSIS OF AWARENESS AND CAPACITY GAPS OF MINISTRIES OF FINANCE IN LATIN AMERICA AND THE CARIBBEAN RELATING TO A WHOLE OF ECONOMY APPROACH TO CLIMATE CHANGE

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FINAL REPORT

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I. Introduction

Climate change and environmental issues present multidisciplinary challenges since they have cascading and domino effects on the economy, society, and the environment, both in the near future and in the long term. They must be addressed in a holistic approach and as a cross-sectional matter with assertive and efficient actions. Nonetheless, climate change as a policy issue has traditionally been a responsibility of the ministries of environment and other environmental organizations. However, because of its scope and impacts, there is a need for other public institutions to take part in climate action.

Given that a massive redirection of financial resources is required to address climate change and that cross-cutting actions are essential in areas such as energy, transportation, water, agriculture, among others (Galindo, Hoffman, Vogt-Schilb, 2022), it is necessary to include an entity that can concentrate and distribute resources to these areas. It is also needed for the institution to take into account the unexpected effects of transitioning to cleaner economies and to be able to counteract them with public policies. This is the case with finance ministries. The increasing extreme weather events in the last few years has incremented the risks associated with the economy and public finances (Pigato, 2019). However, this can be resolved if countries designed mitigation strategies based on long-term goals and identify a roadmap for investment, economic incentives and needed regulatory reforms in all sectors to allow the construction of a decarbonized economy ((BID & DDPLAC, 2019).

Furthermore, the greenhouse gas (GHG) emissions mitigation strategies of developed countries could cause a severe reduction in the demand for fossil fuels. This could add pressure to fiscal revenue in Latin America due to the large dependence to the production and export of nonrenewable fuel sources (Román-Collado & Morales-Carrión, 2018). However, there is recent evidence that shows the benefits of adequately planning the transition to greener economies (Saget, Vogt-Schilb, & Luu, 2020). This planned transition should be headed by institutions with cross-cutting influence among different sectors and with the capacity to coordinate actions between the private and public sector.

Despite the need to limit global warming to between 1.5°C and 2°C, and reduce emissions by 2030, Calero et al (2020) found that only two countries in Latin America and the Caribbean had

national mitigation strategies with a vision for 2050. Although efforts to face climate change are still very insufficient, the Inter-American Bank for Development highlights the fundamental role finance ministries play for designing and implementing long-term strategies to mitigate climate change (Delgado, Eguino, & Lopes, 2021). Elliot et al (2019) suggested that more centralized institutions can help coordinate ministries and other state agencies. Ministries of finance, which often act as the governing bodies of the national planning system, should have a central role in the implementation and integration of long-term strategies (Delgado, Eguino, & Lopes, 2021).

In Latin America, finance ministries have been incorporating climate action into their functions, through analysis and policy design and implementation (Delgado, Eguino, & Lopes, 2021). But often in a non-centralized fashion within the ministry. Therefore, sometimes an organized and homogenous public policy or institutional mandate that addresses the climate change complexity as a cross-sectional issue in the ministry is missing, even in the structure of government in the country.

In this scenario, the World Bank is focused on the role that ministries of finance can have on climate action as part of its *Programmatic Climate Economics Capacity Building Initiative*, which has the objective to provide training and technical work on climate economics and analytical tools and principles for the design of economic and financial climate policy for the just transition to ministries of finance in Latin America and the Caribbean. The main topics that would be covered in the training course would be i) institutions, ii) macroeconomic importance of climate change, iii) climate fiscal risk and fiscal space, iv) private and public green finance, v) climate fiscal instruments, vi) trade and industrial development associated to climate change, vii) equity and just transition.

Fedesarrollo, as part of a short-term consultancy for this initiative, has analyzed the level of awareness of climate change within the ministries of finance, an overview of the capacities and capabilities gaps, as well as priority themes and opportunities for policymaking in four ministries of finance from Latin American countries¹.

¹ The initially selected countries were Bolivia, Brazil, Colombia, Costa Rica, Jamaica, and Mexico. However, despite many efforts from Fedesarrollo and the World Bank, it was not possible to obtain a response form the representatives of Mexico or Bolivia to conduct the interview.

The report is based on three main sources of information: relevant literature for each topic, state of the art reviews for the region, describing the situation of each country on the topic; and interviews to public officials from relevant ministries in the selected Latin American countries carried out by Fedesarrollo.

The report is organized as follows: after this introduction, we explain the methodology used for the assessment; then we present the main results obtained by topic; and finally, we conclude.

II. Methodology

The analysis is based on secondary and primary sources of information: relevant literature for the role of finance ministries in climate change policy and state of the art reviews for the region, describing the situation of each country on the topic; as well as in-depth interviews to public officials from finance or relevant ministries in six Latin American countries carried out by Fedesarrollo. This mixed approach facilitates a review of what the literature has to say on the progress of each country and contrast it with the experience of the countries themselves. The interviews are a key element to learn about actions that might be taking place, but not yet reported in the literature.

Country Selection

The report analyzes six countries in Latin America as a representative sample for the region as a whole. For this sample to be representative², several factors were considered, including geographical, economic, and environmental characteristics. To accomplish this, a database was constructed using three information sources: the World Bank database, the Notre Dame Gain Index database and a manually constructed database that contained geographical information about every country.³

Geography

- I. **Insularity**: 22 of the 42 countries of the region are islands, so it was important that at least one of the selected participants belongs to this subgroup. However, most islands are small

² Not statistically representative, but rather a sample with substantial variation to cover countries of different characteristics that may have different priorities, stakes and interests when dealing with climate issues in general and at ministries of finance in particular.

³ The information was taken for the year 2019, as much information of more recent years could be distorted by the Covid-19 pandemic effects.

countries in the Caribbean with limited data available. In this scenario, the ideal candidate was a country which had available information for most variables in the dataset and with a representative population amongst the islands. Table 1 presents all the islands in the sample, organized by population size and the number of missing variables for each of them (out of 20 total considered variables).

Country (Organized by Population)	Missing Info
Cuba	5
Haiti	3
Dominican Republic	0
Puerto Rico	10
Jamaica	0
Trinidad and Tobago	3
Bahamas, The	0
Barbados	3
St. Lucia	3
Curacao	11
Grenada	3
St. Vincent and the Grenadines	6
Virgin Islands (U.S.)	10
Aruba	10
Antigua and Barbuda	3
Dominica	3
Cayman Islands	11
St. Kitts and Nevis	3
Sint Maarten (Dutch part)	13
Turks and Caicos Islands	11
St. Martin (French part)	13
British Virgin Islands	13

Table 1. Islands organized by population and missing information.

SOURCE: Authors calculations, based on World Bank and Notre Dame

Environment

- a) **Climate change vulnerability:** The Notre Dame-Global Adaptation Index (ND GAIN) is constructed by the University of Notre Dame to measure vulnerability to climate disruptions and readiness to leverage private or public investment for adaptative actions. The index has a value from 0 to 100, where a higher score is better, meaning a country is less vulnerable and better prepared to face climate change impacts.

b) **CO2 emissions per capita:** This measure, obtained from the World Bank database, contains the number of metric tons of CO2 produced in a country each year in relation to its population. The lower this value is, the better, as it means less emissions per person. Table 2 presents all countries ranked by the ND GAIN Index, CO2 emissions and a combined index of the average position of those two. The criterion used for these two variables was to balance countries with a higher position, meaning a better performance on these metrics, and those with a lower ranking that had room for improvement.

Country	Combined Index ranking	GAIN Index ranking	CO2 Index ranking
Costa Rica	1	6	8
Uruguay	2	5	11
Grenada	3	3	20
Paraguay	4	19	5
Dominica	5	7	17
Peru	6	14	10
Colombia	7	18	7
St. Lucia	8	8	21
Barbados	9	2	27
El Salvador	10	23	6
Nicaragua	11	28	2
Brazil	12	17	13
Guatemala	13	26	4
Panama	14	9	22
Chile	15	1	30
St. Kitts and Nevis	16	4	29
Haiti	17	32	1
Jamaica	18	15	19
Belize	19	25	9
Honduras	20	31	3
Argentina	21	11	25
Cuba	22	22	15
Ecuador	23	24	14
Mexico	24	16	23
Dominican Republic	25	21	18
Bolivia	26	29	12
Bahamas, The	27	10	32
Antigua and Barbuda	28	13	31
Trinidad and Tobago	29	12	33
Suriname	30	20	28
Guyana	31	27	24
Venezuela, RB	32	30	26

Table 2. Countries organized by the created combined index.

SOURCE: Authors calculations, based on World Bank and Notre Dame

- c) **Progress on climate action:** The Climate Action Tracker, an independent scientific analysis produced by Climate Analytics and the New Climate Institute, was used. This tool measures the advance on the fulfillment of the Paris Agreement, ranking each country by

how they are progressing. This metric complements the two previous ones by identifying which countries have effectively advanced in their climate change commitments and those that may be lagging behind.

Socioeconomic

- a) **Population**: Across the region countries have a wide range of population levels. There are heavily populated countries, such as Brazil (211 million of inhabitants) or México (127 million of inhabitants) and some countries that are considerably smaller like the British Virgin Islands (30.000 inhabitants). The selection process aimed to select big countries, as they have a larger influence on the region, and some smaller countries. However, it was not optimum to select very small countries, as they might not be representative for the region.
- b) **GDP**: Like population, the region has a vast difference on GDP measures. Brazil and Mexico come on top again for this measure, and Dominica ranks the lowest. Again, the selection process was done looking for countries in both ends of the distribution, but avoiding those too far on the left side of it as they might have less relevance and representativity in the region. A measure of GDP per capita (PPP) was used. Appendix 1 presents a table with all countries and their measures for population, GDP and GDP per capita (PPP).

Other

- a) **Language**: There are three main languages spoken in the region (Spanish, English and Portuguese), so it was important for the sample to contain at least one country that mainly spoke one of each language.

The sample was selected based on these criteria. As said, it includes the countries with the best and worst performance by criteria, as well as an English-speaking country - Jamaica and a Portuguese speaking one - Brazil. The selected countries were:

1. **Jamaica**: was selected based on insularity and language (English) as the main factors. It ranks about halfway in the environmental indexes and also in the socioeconomic features.

2. **Costa Rica:** was selected because of its environmental performance, as it ranks first in the combined index. In the socioeconomic features ranks almost at the middle, with a GDP per capita (PPP) above the average.
3. **Colombia:** a relatively big economy in the region that ranks above average in the environmental index. Even though, the results on adaptability are not very good.
4. **Brazil:** is the biggest economy of the region, as well as the most populated country. Its environmental statistics are around the middle of the region, but ranks lower in the vulnerability index. Language criteria was also important as it is the only Portuguese speaking country in the region.
5. **Mexico*:** it is the second biggest country of the region in terms of population and GDP. The environmental performance is below average, especially the emissions per capita of the country.
6. **Bolivia*:** a country with a relatively small economy and poor environmental results. The selection of this participant was meant to understand how countries with socioeconomic priorities can improve their environmental performance.

Interview Protocol Design

a) Questionnaire design

As part of its *Programmatic Climate Economics Capacity Building Initiative*, the World Bank has designed a tentative curriculum for a capacity-building course for Ministries of Finance in Latin America. The questionnaire for the in-depth interviews designed by Fedesarrollo is based on this curriculum (see Appendix 2). The first step was organizing the curriculum into seven comprehensive themes that cover all the required areas of knowledge. These themes are i) institutions, ii) climate change and fiscal policy, iii) climate policy and fiscal policy, iv) fiscal instruments for climate action, v) public and private green finance and vi) self-assessment.

The second step was to create the survey questionnaire, with the aim of collecting relevant and truthful information on each theme. Initially, the questionnaire was to be sent to each Ministry of Finance to be answered as a survey. For this reason, the questions were closed-ended with multiple choice answers or in a Linkert scale⁴ (see Appendix 3). However, both the World Bank and

⁴ This scale is used to classify a person based on his or her level of agreement or disagreement to a statement.

Fedesarrollo considered that an interview would allow for a better response rate, and for more in-depth answers for each theme, and give more space to the interviewees to answer the questions.

Thus, the survey questionnaire with closed-ended questions was transformed into personalized interviews for every country. For this process, all questions were filtered, prioritized, and reorganized without changing the original narrative according to research done for each of the sample countries.

The final interview guide contains 22 questions for the six themes from the World Bank curriculum and is in English and Spanish (See Appendix 4).

Two pilots were carried out to test the interview guide. One with Felipe Larraín, former Minister of Finance during the government of former President Sebastián Piñera of Chile (2010-2014), who was instrumental in the creation of The Coalition of Ministers of Finance for Climate Action and was pivotal in the way he introduced and gave priority to climate issues at the Chilean Ministry of Finance during his leadership. And the second one with Laura Marcela Ruiz, former adviser to the Technical Deputy Minister of the Colombian Ministry of Finance, who has spent several years in charge of climate issues at the Ministry and has witnessed this agenda emerge from a relatively marginal issue to one of higher priority as Colombia developed its carbon market, issued its first sovereign green bond, implemented fiscal instruments to influence behavior towards climate action, etc. These two pilots provided useful information for the report, as well as feedback on the questions, language, and length of the interview.

b) Contact with Finance Ministries

For the interviews, the first contact with the ministries was done by the World Bank. Later, Fedesarrollo would set a date and time for said interview. The duration of the sessions was one hour, and the interview was conducted by Fedesarrollo's researchers. It is important to note that, despite many efforts from Fedesarrollo and the World Bank, it was not possible to obtain a response from the representatives of Mexico or Bolivia to conduct the interview. The following list shows the name, country, and date for each of the interviews.

Country	Respondents	Date of Interview
Pilot (Chile)	Felipe Larraín	August 19th 2022
Pilot (Colombia)	Laura Ruiz	August 31st 2022
Colombia	Diego Guevara	September 8th 2022
Jamaica	Trevor Anderson	September 8th 2022
	Karelle Samuda	
	Anaitee Mills	
	Keenan Falconer	
Brazil	Edson Silveira	September 14th 2022
	Carlos Carvalho	
	Claudia Girotti	
Costa Rica	Marco Solera	September 23rd 2022
	Melvin Quiros	
Mexico	Unrespondent	
Bolivia	Unrespondent	

Table 3. Date and respondents for interviews.
SOURCE: Authors elaboration.

III. Results

This section analyses the answers obtained in the interviews for each of the six themes. For each theme, a brief introduction is presented, where the importance of the topic is underlined. Then, general conclusions are presented with some relevant examples from each country. It is important to keep in mind that if a country is not mentioned in a section, it does not mean there is no progress on that specific topic, only that other countries were selected as examples. On a similar note, it is also important to note that all topics were not covered in every interview, either because of time restrictions, or because the person responding the interview did not have information.

Institutions

There is recent evidence that shows the benefits of adequately planning the transition to greener economies (Saget, Vogt-Schilb, & Luu, 2020). This planned transition should be headed by institutions with cross-cutting influence among different sectors and with the capacity to coordinate actions between the private and public sector. Although efforts to face climate change are still very insufficient, the Inter-American Bank for Development highlights the fundamental role finance ministries play for designing and implementing long-term strategies to mitigate climate change (Delgado, Eguino, & Lopes, 2021). Elliot et al (2019) suggested that more centralized institutions

can help coordinate ministries and other state agencies. Ministries of finance, which often act as the governing bodies of the national planning system, should have a central role in the implementation and integration of long-term strategies (Delgado, Eguino, & Lopes, 2021).

In general terms, the region presents a significant level of awareness in terms of climate change inclusion in the daily actions of financial agendas, policy making and social issues. According to a recent report by the Inter-American Development Bank (Delgado, Eguino, & Lopes, 2021), Costa Rica has made progress in incorporating finance and planning ministries into decarbonization strategies. In 2019 a coordinated effort between Presidency, the Ministry of Environment and Energy and the support of the Ministry of National Planning and Economic Policy (MIDEPLAN) resulted in the National Decarbonization Plan 2018-2050. This document contains short, medium and long-term goals for different sectors like transportation, energy, construction, sanitation and livestock. The support of MIDEPLAN was essential due to several actions related to the implementation of the Decarbonization Plan. Among these actions are fiscal sustainability of the Plan, investment planning, integration of the objectives of the Plan in the processes of prioritization of public investments, alignment of sectoral strategies and provision of human resources, monitoring and evaluation of effectiveness and efficiency of public spending, governance for implementation and mobilization of financing, including international resources (Delgado, Eguino, & Lopes, 2021). However, each country faces the challenges of climate change according to its own needs derived from its financial dynamics, and according to the economic sectors that impact or are impacted by climate change in a significantly higher way compared to the other sectors.

This first section seeks to characterize the technical capacity and identify the needs of the Ministries to design long-term plans that mitigate climate change in a cross-cutting way. Institutional capacity is related with the existence of specialized groups for climate action, the ability to seek policy-making advice through Bilateral and Multilateral Cooperation, and the amount of external support for studies, analyses, and tools to incorporate climate action in economic and financial models, the national budget, public procurement, investments, and others.

During the interviews, it was noted that there are specific examples of the diversity of approaches that exist in relation to climate change. One of the outstanding cases is Jamaica, which directs most of its efforts to have a strong resilience against natural events of a destructive nature,

which due to its natural location makes the island an area of high risk of natural disasters. The efforts are mainly observed in assigning climatic events a relevant participation in the country's annual budget. That is, the Ministry of Finance seeks to anticipate and guarantee the necessary financial resources to be highly resilient in the event of an extreme weather event. Likewise, there are cases where the efforts to address the climate change challenges are focused on supporting the economic sectors and activities that have the greatest impact on the environment, for example, in Brazil, efforts have been geared towards the establishment of a market for carbon credits that makes it possible to help the sectors with difficulties in reducing emissions.

The first two questions in the interview ask about the presence of mandates or strategies and specialized teams with technical capacity from the ministries or from a high level of government. The information received in most cases coincides with the existence of strategies or working groups that deal with matters related to climate change. For example, in Jamaica, there is a budget allocation strategy for climate events that is measured year after year and a climate change division outside the ministry that oversees monitoring environmental variables. In the case of Costa Rica, there is no formal climate change team. However, all departments of the Ministry of Finance actively participate to meet environmental needs. In Colombia, there is a strategy in the process of being consolidated and that currently shows results such as the allocation of the investment of public resources received from royalties for climate mitigation needs for productive regions and different initiatives to include environmental taxes in future tax reforms. Finally, Brazil stands out for its specialized team to meet the challenges brought by climate change. This team was established this year and is mainly articulated with the environmental ministry, foreign relations ministry, and energy ministry. This is a new structure that organizes the policies on climate change and the carbon market. This sub direction is monitored by the Ministry of Finance, the Ministry of Planning, and the Ministry of Industry.

Another set of questions was about work done with external entities to carry out studies, obtain advice, or recommendations on climate policies. All countries agree on the necessity of work with external entities, in some cases more than in others. For Colombia, collaborative work with the National Planning Department is key. They also consider very important some consultancies carried out with the Inter-American Development Bank and the World Bank. The academy has

played an important role for some studies that are beyond the technical capabilities of the Ministry of Finance. In the case of Brazil, there is permanent work with Non-Governmental Organizations, Associations, and Federations, as well as with multiple Universities and consulting firms that are in constant work with the ministry to develop research and assistance. In Costa Rica, the work with multilateral and bilateral organizations stands out to strengthen the capacities of the ministry in areas where such support is required. The French Cooperation Agency has been the most important ally. Finally, in Jamaica, in-housework is prioritized, although the use of tools such as the "work sustainability analysis tool" is recognized, which allows the analysis and preparation of the nation's annual budgets considering the needs resulting from natural disasters. This tool is the result of the work of external entities, but its use is limited to the ministry and the analyses are done within it.

Climate change impacts and fiscal policy

In the last few decades, there has been an increment in historical global temperatures (Faust, 2018) and in the number of natural disasters (Munich RE, 2018). These events cause several economic and physical damages. As a result of this, governments have been forced to design and implement policies to deal with climate change and to improve the governance and management of these events. From a fiscal perspective, the greater frequency of these events implies a greater risk of negative shocks to the fiscal accounts and, therefore, it is important to take their occurrence into account in medium-term fiscal frameworks (Delgado, Eguino, & Lopes, 2021).

In Latin America, the countries with the greatest increases in natural disasters in recent decades are Guatemala, Guyana, Paraguay, El Salvador, Bahamas y México (Delgado, Eguino, & Lopes, 2021). However, there is heterogeneity between the number of disasters experienced by different countries. For example, Mexico and Brazil experienced at least one event per year on average, while Panama and Suriname did not. Given the increase in exposure to extreme weather events, Latin America has made significant progress in adaptation and mitigation policies to soften the fiscal consequences. However, there is still room for progress in areas such as fossil fuel subsidies and the development of green taxes. In this last field, the region could learn from the advances in countries such as Chile and Mexico (Delgado, Eguino, & Lopes, 2021). Additionally, these countries stand out for their tools to report the risk governance management of a country using the Index of Governance and Public Policy in Disaster Risk Management (iGOPP).

There are several mechanisms through which extreme weather events affect public finances. First, there is an increase of public spending to attend the costs of the damages. Second, these events negatively impact the production of several sectors and consequently, reducing the tax revenue. Lastly, when the affectations have a long-term duration, there could be an increase in public debt. These impacts have a negative effect on fiscal stability. However, this could be avoided if countries adopt adequate mechanisms of insurance against the risk of natural disasters.

Through the interviews we concluded that climate change is somehow present in fiscal policy around all countries, although in different ways. It is common for all countries to have models that incorporate climate change and its effects in fiscal policy. For example, Jamaica includes potential natural disasters in their instruments, which allows them to incorporate climate risks in macroeconomic planning. Costa Rica is another example, as they work together with the Central Bank to incorporate climate change in intermediate macroeconomic policies. However, all countries recognize that they could make improvements in this area. This is either because the models are limited to determined sectors, as happens in Brazil with the agricultural sector, or because the instruments are not entirely attached to the infrastructure of the ministry, as happens in Colombia. The recognition of the importance of this topic is clear to all Ministries of the region, they have taken steps to incorporate climate change in their fiscal policy and are willing to improve in this area, which is a positive aspect to be considered in the skill-building course.

The first question of this section was about the inclusion of climate change in the macroeconomic models used by the Ministry. There was a broad variety of responses, but all of them converged in one point: climate change is somehow included in the models used by the ministry, but not in all of them and not as much as it should be. For example, Jamaica includes possible impacts on the budget caused by natural events and in Colombia climatic factors are included in the risk used in the models. Brazil is still working on different strategies, such as a green taxonomy and a sectorial plan, to include climate change in the models, as they don't have it yet. Costa Rica, on the other hand, does an analysis to position the climate agenda in the ministry, that is the considered in the decision-making process.

Second, the interview enquired whether the ministry estimated the effects of climate change on poverty and inequality. In none of the countries there was an assertive answer to this question.

Most finance ministries don't measure the possible impacts of climate change in socioeconomic variables. It is very common for other entities to carry out the study of these variables. For example, Jamaica and Colombia where the institute of planning is in charge of those analyses. In these cases, it is not the ministry that assumes the measure of said effects, but uses the report given by the responsible entity. However, it is not possible to affirm that the effects of climate change on poverty and inequality are no included in the ministries' decision making process. The main problem is the absence of an official mechanism to include climate change in the discussion about socioeconomic variables.

The third question of this section was about the integration of climate change elements in monetary policies. In most countries of Latin America central banks are exclusively in charge of monetary policy, where the ministries of finance have little influence. This was the case of the interviewed countries, where all monetary decisions were external to the ministries' mandates.

Finally, it was asked if the ministry uses methods or analytical tools to identify, assess and monitor climate risks in the financial system. Again, there was not a direct answer from any of the countries, but all of them have taken steps in this direction. For example, the central bank of Jamaica includes these variables in their operation and in the information shared with the ministry for the decision making. Costa Rica is working on the development of these instruments alongside the World Bank. Colombia incorporates these topics indirectly, as they include it in the financial strategy for risk management.

Climate policy and fiscal impacts

As mentioned before, there are a lot of benefits of adequately planning the transition to more sustainable economies. On the contrary, a disorderly transition process to low carbon economies can negatively impact the financial sector and the macroeconomic balance (Delgado, Eguino, & Lopes, 2021). However, when adopting strategies for transitioning to low carbon economies, planning and finance ministries need to evaluate the cost of these strategies to understand how to properly face them. In 2019, Chile's president presented a plan for the closure of coal-fired power plants and transition to renewable energy. This could mean losses between 400 and 4,000 jobs by 2030 (ibid.) and severely impact the employment of regions where the plants operate, leaving the communities without sources of income and without the social benefits these coal-fired power

plants offer. To face these challenges, it is necessary to provide alternatives to these communities affected by the transition. Additionally, ministries of planning and finance must gradually reduce the dependency of public budgets on hydrocarbons incomes and diversify the economy especially in Bolivia, Colombia, and Ecuador where the share of oil revenue has increased (ibid.).

Finance ministries have several instruments they could use to alter the course of the economic system towards more sustainable economic growth. For example, they could evaluate how to change the decision-making process of public budgets in a way that is consistent with the sustainable development goals. They could also modify existing state subsidies to polluting sectors, like subsidies to fossil fuels, and redirect them to less polluting sectors. The interviews proved that this is a point that needs to be strengthened across the region. We concluded that none of the countries has a real measure of the real aggregate costs of their climate policies in the midterm. This does not mean that there is no control over the expenditure in climate change action, but that the real effects of these policies and the relation with other fiscal policies are not precisely measured yet. In this sense, there is plenty of space for the World Bank training course to address this topic and provide tools to have a comprehensive measure of the costs of climate policies.

The first question of this section was about the inclusion of climate change in the budgeting process and its allocation. We found that some countries have a more specific procedure to take this into account. For example, in Jamaica contingencies and disasters (like floods, storms or others) have a fund in the budget. However other countries like Colombia have a broader strategy, like introducing goals to ensure economic growth with environmental quality. There are also countries that do not have specific rules of inclusion of climate change in the budget, as it is allocated depending on each scenario.

In the second question, we asked about the estimation of climate policies costs and how they are included in fiscal policy without affecting sustainability. Some countries, like Costa Rica, didn't have a plan to measure the cost of climate policies in the medium and short term, as it is not a priority. However, there were other ways to measure the impacts of climate policy that were being used. For example, in the ministry of Colombia all decisions surrounding this topic are done considering whether it breaches foreign trade agreements (FTA), keeping in mind that this brings heavy economic fines. However, this is the only cost consideration done for these types of policies.

The third question was about the use of economic tools to calculate the impact of climate policies in polluting economic sectors and the economy in general. This point is clear in some countries. For example, Costa Rica has had a clean energy matrix for some years, and this does not require big investment. Their main worry now lies in the transportation sector, as modernizing and electrifying it does require a big investment. However, in other key sectors, such as agriculture, they have made great advances in NAMA's (Nationally Appropriate Mitigation Action). On the other hand, countries like Jamaica still face a big challenge in the agriculture sector, where climate policies would represent great affectations. Also, there are concerns about water storage policies, as this would be a main issue in a disaster scenario.

The final question of this section explored if the ministry incorporates in its models the effects of climate policies in poverty, unemployment, and inequality. As these variables have a special relevance in Latin America, all countries care about them deeply. However, not all of them have the same strategies and actions. For example, in Jamaica it is the Central Bank that must look over the effects of climatic policy in economic vulnerable people. In Colombia, there is observance of this in the achieving of the NDC but is not included directly in the models. Costa Rica might be the most advanced country on this issue, as they include climatic variables in the measure of multidimensional poverty. Also, they incorporate this discussion in their fiscal policy: for example, they have not established a tax on vehicles emissions as it would be regressive and could affect equality (older and cheaper cars tend to produce more emissions).

Fiscal instruments for climate action

Due to the fiscal constraints' governments in Latin America and the Caribbean face, it is imperative that national planning and financing instruments are directed towards efficient and targeted use of public resources to achieve net-zero emissions development goals. For this reason, different ministries of finance in the region have implemented different public policies with a positive impact on climate. However, there are still several areas that require attention from the finance and planning institutions. For example, tax policy, subsidies and incentives, public investment planning, monitoring of the efficiency and effectiveness of public spending, coordination of intersectoral progress, and leveraging of investments (Delgado, Eguino, & Lopes, 2021). Incentives to different sectors, like subsidies to fossil energy, have a negative effect on the

environment. However, modifying the subsidies is not an easy task, especially due to the consequences of eliminating them on the cost of energy, foods, and public transport. In Chile and Ecuador there were several protests due to the modification in the gasoline subsidies. Therefore, it is relevant not only to modify the subsidies to the fossil energy sector, but also to propose social assistance programs for those most affected and vulnerable by these measures.

A recent publication by the Inter-American Development Bank found several opportunities for finance ministries to advance in their contribution (2021). The first is to improve the legal framework and disaster management capacities both at the different levels of the public sector and in the private sector. The second is to define the guidelines and rules to internalize disaster risk assessments throughout the management cycle of public investment projects. This could help the development of regulatory, institutional, and budgetary conditions in disaster risk management in Latin America and the Caribbean.

In addition, the impacts and risks associated with climate change, for example in the agricultural sector, are seen as a decrease in the production and quality of food, lower incomes and higher prices; in the health sector, a spread of vector-borne diseases is associated with changing altitude and longitude; among others, they favor the increase in the demand for statistics on climate change, then, this information boom establishes regional patterns of climate change such as the rise in sea level, droughts and floods, temperature variations, and others. As a result, despite the fact that Latin America is one of the regions that makes the least negative contributions to climate change, it is one of the regions that will surely suffer the greatest negative consequences on the population, ecosystems and economic activities, as well as the region is highly vulnerable to extreme weather events (Quiroga, 2017). Hence, the region has committed to different strategies such as the Paris Agreement, the Sustainable Development Goals and, in general, the National Policies on Climate Change, which in short lead to the planning and implementation of various fiscal instruments for action climate.

The Fiscal instruments for climate action are all the taxes, subsidies, exemptions, compensations, or any fiscal incentive that generates a positive impact on the environment in each country of the region as well as studies or projects for the implementation of tax incentives. Consequently, this section reviews the different fiscal instruments implemented, as well as those

that are in the process of being prepared that contribute to the challenges of climate change. In addition, the fiscal incentives that have the objective of contributing to the reduction of greenhouse gas emissions in the economic sectors with significant impacts on the environment and the effects of fiscal tools in terms of poverty and inequality will be discussed.

The starting point for the implementation of fiscal instruments is the identification of the economic sectors and activities with the highest greenhouse gas emissions. Next, through a comparison of the tax collection of Latin America in reference to the European Union, there are opportunities to strengthen the collection capacity in each sector, especially in the energy sector, in which both regions have important impacts. in terms of GHG, but with a lag in the Latin American and Caribbean region in fiscal terms (Barcena, et al., 2018).

Furthermore, it is important to understand the specific needs of each country. In some sectors the work should be focused on adaptation tasks and in others on mitigation. For the first case, the valid instruments are grants, subsidies, exemptions, compensations, and all those that lighten the tax responsibility, that allow the adaptation process to have less macroeconomic impacts. Moreover, mitigation must be worked with fiscal instruments such as green taxes. Adaptation or mitigation approach that each sector demands due to its nature. It was found that there is a lot of work to be done in this area. There are relevant advances, but surely stronger work must be generated to achieve the results expected in the short term.

In the interviews, the first question of this section was which green taxes or fiscal collection instruments related to climate change exist or have been thought of for their implementation. In Colombia, a carbon tax was implemented in 2016 and during the period 2018-2022 a lot of work was done to implement more fiscal instruments. Even if most of these instruments were not implemented, mostly due to the influence of powerful industries lobby, this effort is considered a right step for future tax reforms. In the case of Brazil and Costa Rica, the tax on fossil fuel stands out as an important resource for the national budget. In Jamaica, the climate directorate has been working on structuring green taxes or other measures, like a ban on single-use plastics.

Next, the interview asked about subsidies, exemptions or compensations for economic sectors with high emissions. In general, all countries have a sector that receives economic benefits even if is contaminant. However, given the importance of those sectors for the economy it is difficult to

change this situation. In Jamaica, there is a subsidy for kerosene oil and, even if there is not a direct subsidy for gas, the prices are adjusted weekly. In Colombia, there have been attempts to remove these subsidies, but it is not possible as it would have big impacts in inflation (mostly the case of gasoline subsidy). In Brazil, the sector with the most subsidies is agriculture and, given the importance of this for the economy, it is not possible to remove them.

Finally, the interview looked into the development of subsidies, exemptions or compensations for environmentally friendly economic sectors. This is not a developed policy in the interviewed countries, where only a few things have been done. Costa Rica has established subsidies on the import of electric cars, the alternative use of land to avoid deforestation and the use of solar energy. Jamaica also has a 90% tax deduction for electric cars. In Colombia, the ongoing tax reform is aiming to incorporate some benefits for this type of activities, but so far it is just a project.

Public and private green finance

Mitigation and adaptation to climate change requires large amounts of resources channeled towards different sectors. Nonetheless, the resources needed to finance the transition to greener economies greatly exceed the capacity of governments (Delgado, Eguino, & Lopes, 2021). However, finance ministries, as regulators and supervisors of the financial sector, have a fundamental role to act as catalysts for private investment towards more sustainable projects and decisions. In this way, they acquire all the resources for an orderly and planned transition. Although the private sector represents a possible solution to the lack of resources, there are many challenges to the current organization of markets and the regulatory system to allow the flow of private capital (BID y DDPLAC, 2019).

Among the main challenges that finance ministries must take on are establishing the necessary incentive frameworks, planning public investments, create conducive environments for private investment to be in line with the sustainable development goals and increase its effective access to international climate finance resources. Furthermore, there must also be an effective conversation between the private and public sectors to coordinate the different sources of financing towards the same objectives that are aligned to reduce net emissions. All of the above is with the vision that finance and planning ministries effectively evaluate and determine how to effectively attract multiple sources of capital.

A case to highlight of the advances in terms of relations between the private and public sectors is Chile. The Ministry of Finance prepared the country's Financial Strategy for Climate Change whose objective is to accelerate the flow of resources towards a resilient economy (Delgado, Eguino, & Lopes, 2021). The following lines of work are presented in the strategy: generation of information, data and analysis to mobilize capital flows, promotion of the design and implementation of green financial instruments and the promotion of markets, and strengthening of the understanding, capacities and action of the financial sector regarding risks and opportunities derived from climate change. The document is an example of the framework of action that countries can take to encourage private investment, since it defines specific objectives, progress, and short-term actions.

This section discusses the role played by the Ministry of Finance in the dynamics of climate resource mobilization, the economic tools linked to green finance, and market regulation and supervision. It includes a description of private sector participation, as well as of financial and insurance sectors against the risk associated with climate change in the financial market. It is essential to understand the financial dynamics of the region as a group of heterogeneous countries that have different needs. In the Caribbean area, increasing resilience to extreme weather events becomes the priority in terms of climate action. However, in continental countries there has been progress in climate action in the financial dynamics of the main economic sectors.

The starting point in green financing has come from the climate action plans of each country, which are the result of the commitments set out in their Nationally Determined Contributions (NDCs), just transition strategies at the national level, as well as policies and other national agendas in relevant areas. In all cases, a sectoral identification has been carried out to guarantee that green financing has the expected impacts.

Based on the relevant cases in the region, Chile is presented as an outstanding example in the implementation of the "Global Carbon Market" (GCM) that technically supports the country's efforts in the design and implementation of carbon price adapted to the socioeconomic reality of the country, with a view to integration with global carbon markets, as part of the set of climate policies necessary to comply with its international commitments and move towards carbon neutrality by 2050. Thanks to this strategy, the capabilities of the public sector have been

strengthened to make the most of carbon pricing policies and the potential of markets, to facilitate active participation of the private sector in carbon markets, through capacity building and awareness raising, and finally, consolidate Chile's international position in global discussions on carbon pricing.

The first question of this module was about the green financing instruments that have been used to strengthen green finance and private participation, and the role of the finance ministry in this regard. The interviewed countries present important advances in the matter. Costa Rica is the most advanced country in this aspect. Their central bank has already emitted green bonds internationally. They have also used the help of multilateral entities to reinforce green finance and their decarbonization plan. Brazil has also emitted green bonds to finance sustainable and conservative projects. They expect to receive up to 5 billion dollars to use in projects in the Amazon Forest. Jamaica has a catastrophe bond in order to prevent environmental and economic crisis caused by natural disasters. Colombia developed in 2021 a legal framework for the emission of sovereign green bonds and in that same year successfully completed their first emission.

The second (and last) question of this section was about the development of green taxonomy to classify climatic investments. In this point there were divided answers, as some countries had already developed a green taxonomy and some had not. Costa Rica and Colombia were the two countries that already had this tool to classify green investments. On the other hand, Jamaica and Brazil don't have one. However, the Brazilian ministry is conscious about the necessity of a green taxonomy and are willing to start developing it.

Self-assessment

The final section of the interview contained self-assessment questions. Participants were asked what they thought their country could offer as a strength that could be added to the course as an example for other countries. They were also asked what they thought was a topic in which their country had room to improve. The objective of these questions was to understand the priorities and main interests of each country as inputs for the skill-building course.

As expected, all countries had different focuses depending on their needs, and those were the ones pointed out as main contributions for the course. This is highly positive, as every Ministry had a different experience to share and different progress points that are replicable in other

countries. For example, Costa Rica is a worldwide reference in decarbonization, being one of the most advanced (if not the most) countries in the world. Brazil has big developments in their agriculture plan and the creation of their carbon market. Colombia has recently worked in creating a technical group inside the Ministry. Jamaica can be a referent in climate disaster prevention. All interviewed countries have interesting content to add to the course.

For the second question, there were some common points as well as some diverging opinions. The main answer, given by almost every country, was the need for better instruments to incorporate climate change into their macroeconomic analysis. They want these instruments and the knowledge to operate them inside the ministry. Another common point was interagency communication. Most countries want to learn in the course how to involve other entities in climate change action, such as other ministries, central banks, international actors, and other national agencies, like the meteorological one. As for specific topics, Brazil suggested sustainable public procurement, and Colombia proposed for a space to constantly share experiences between countries.⁵

IV. Conclusions

This section presents the conclusions drawn from the interviews and the exercise in general. It is divided in two main sections: the level of inclusion that climate change has in the finance ministries, and the overview of capabilities and capacity gaps around the topic.

Level of awareness of climate change within Ministries of Finance

Addressing climate change is a priority for all the interviewed countries. All of them state the need to improve the articulation and coordination between the different instances within the ministries of finance and with agents outside the ministry, such as academy, the private sector, or other government agencies. In some cases, there are efforts that even go beyond the internal management of the country, like the Coalition of Finance Ministers For Climate Change (CFMCA) or the presence of multilateral banks.

There is a general objective to strengthen resilience against climatic events or as a requirement to participate in financial dynamics exogenous to each country. Additionally, there are many opportunities to adopt better practices to reduce the environmental impacts caused by the economic

⁵ Annex 5 presents a summary of the answers given across all interviews. Annex 6 presents a summary of the needs of every country interviewed.

activities of each country. For example, all countries seek improvement in the national energy matrix or in the use of fossil fuels for the automobile fleet of each country. Although some have made good progress, others require profound transformations, but in general all are aware of these issues and they know that they must be in constant change so as not to fall behind with respect to the challenges that climate change demands.

As for the mandates of the ministries regarding climate change, there is a big space for improvements. Even if all ministries incorporate climatic issues to some extent in their daily basis's operations, it is mostly because of the interest of particular people or groups inside the agency and not from a formal mandate. It is necessary for all countries to incorporate clear and specific mandates for the finance ministries to deal with climate issues in their models and their planning.

Overview of capacities and capacity-needs and gaps

As has been mentioned, each country has focused their efforts on the topics they consider most important. This has consequently led to a very broad range of capacities and capacity gaps throughout the region. However, some interesting conclusions could be obtained from the exercise. Mainly two topics were identified as capacities gaps: analytical tools or instruments and budgeting endeavor.

One big challenge that ministries of finance must address is how their analytical tools, approaches, methodologies, etc. are incorporating climate change and sustainable issues. As an overview of the analytical tools, approaches, methodologies used by the finance ministries interviewed, it is observed that each ministry has been advancing on their own pace towards the inclusion of climate change and sustainable issues on their analytical tools. It must be considered that this progress depends on their interests in the matter and their vulnerability to climate change. However, it was commonly stated that their instruments were not sophisticated enough or fell short in many aspects. Thus, a main point to be treated in the course should be the development and management of instruments that allow the introduction of climate change in the ministry's planning.

Budgeting endeavor also presented gaps to be filled. On the one hand, ministries of finance have the challenge to identify green projects that need resources to be implemented and determine the costs of climate policies that the country is developing. Particularly, in the Paris Agreement framework, many countries have an NDC, so the ministries of finance need to estimate how much

the NDC is going to cost. On the other hand, ministries of finance can contribute to climate action by identifying the resources that are being allocated to green projects and climate policies. To do so, there are some methodologies called budget classifier and tracer that can help ministries of finance have a better understanding of how the budget is aligned or not to climate action and their NDCs. Even though the ministries of finance are the ones in charge of the budget, the other ministries must also learn to identify green projects in their sector that need resources from the budget.

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VI. Appendices

Appendix 1: Population, GDP and GDP per capita (PPP) of all countries

Country	Population	GDP (in millions)	GDP per capita (PPP)
Brazil	211.000.000	\$ 1.873.288,0	\$ 15.358
Mexico	127.600.000	\$ 1.269.404,0	\$ 19.863
Colombia	50.339.443	\$ 323.109,5	\$ 15.673
Argentina	44.938.712	\$ 452.818,4	\$ 22.997
Peru	32.510.462	\$ 228.323,5	\$ 13.401
Venezuela, RB	28.515.829		
Chile	18.952.035	\$ 278.584,7	\$ 25.323
Ecuador	17.373.657	\$ 108.108,0	\$ 11.850
Guatemala	16.604.026	\$ 77.020,0	\$ 9.019
Bolivia	11.513.102	\$ 40.895,3	\$ 9.093
Cuba	11.333.484	\$ 103.428,0	
Haiti	11.263.079	\$ 14.785,8	\$ 3.203
Dominican Republic	10.738.957	\$ 88.941,3	\$ 19.190
Honduras	9.746.115	\$ 25.090,0	\$ 5.978
Paraguay	7.044.639	\$ 37.925,3	\$ 13.148
Nicaragua	6.545.503	\$ 12.596,6	\$ 5.676
El Salvador	6.453.550	\$ 26.896,7	\$ 9.147
Costa Rica	5.047.561	\$ 64.417,7	\$ 22.632
Panama	4.246.440	\$ 66.984,4	\$ 32.767
Uruguay	3.461.731	\$ 61.231,1	\$ 24.005
Puerto Rico	3.193.694	\$ 104.914,6	\$ 36.274
Jamaica	2.948.277	\$ 15.830,8	\$ 10.190
Trinidad and Tobago	1.394.969	\$ 23.886,2	\$ 27.960
Guyana	782.775	\$ 5.173,8	\$ 13.634
Suriname	581.363	\$ 3.984,5	\$ 19.840
Belize	390.351	\$ 1.945,3	\$ 7.455
Bahamas, The	389.486	\$ 13.192,8	\$ 38.064
Barbados	287.021	\$ 5.304,2	\$ 16.154
St. Lucia	182.795	\$ 2.118,8	\$ 15.842
Curacao	157.441	\$ 2.995,2	\$ 24.658
Grenada	112.002	\$ 1.213,5	\$ 17.579
St. Vincent and the Grenadines	110.593	\$ 910,1	\$ 14.031
Virgin Islands (U.S.)	106.669	\$ 4.117,0	
Aruba	106.310	\$ 3.310,1	\$ 39.834
Antigua and Barbuda	97.115	\$ 1.687,5	\$ 22.772
Dominica	71.808	\$ 611,5	\$ 12.850
Cayman Islands	64.948	\$ 5.943,6	\$ 76.836
St. Kitts and Nevis	52.834	\$ 1.164,9	\$ 29.800
Sint Maarten (Dutch part)	41.608		
Turks and Caicos Islands	38.194	\$ 1.197,4	\$ 30.486
St. Martin (French part)	38.002		
British Virgin Islands	30.033		

Appendix 2: Curriculum

Theme	Topic	Subtopic	Description
Institutions	Role of ministries of finance in addressing climate change		<ul style="list-style-type: none"> - Implications of climate change for the mandates and functions of ministries of finance, implications of climate policy for the mandates and functions of ministries of finance. - Means by which the ministry of finance can contribute to climate action: enabling policies, regulatory frameworks, and incentives for green finance.
		Reforming institutional architectures for a sustained climate action	<ul style="list-style-type: none"> - Processes and mechanisms for institutional reform aimed at mainstreaming climate change and climate policy into the mandates and functions of ministries of finance.
		Public financial expenditure management for climate action	<ul style="list-style-type: none"> - Approaches and methods for mainstreaming climate change and climate policy into public financial management. - Green and resilient infrastructure governance. - Tracking of climate-related expenditures. - Green public procurement. - Green and resilient public financial management.
		Greening public finance	<ul style="list-style-type: none"> - Assessment tools and implementation approaches to adopt green finance into public budgeting and investment planning, monitoring and reporting: green taxonomy, incentives, financing instruments, public-private partnership, private sector co-financing, domestic and international investors.
		Reforming state-owned enterprises	<ul style="list-style-type: none"> - Evaluation of the vulnerability of state-owned enterprises to climate change and of their role and impact on decarbonization goals. - Approaches for reforming state-owned enterprises aimed at climate resilience and low emissions management.
Climate change and fiscal policy	Economies of scale in climate impacts	Physical tipping elements	<ul style="list-style-type: none"> - Approaches and analytical tools to evaluate the economic and social effects of climate tipping points, like mass migration and conflict.
		Macrodynamics of cascading damages and compound risks	<ul style="list-style-type: none"> - Approaches and analytical tools to evaluate how climate related impacts and costs spread throughout the economy, including the identification of related channels and compounded domino effects.
		Macro financial stability and macroprudential policy	<ul style="list-style-type: none"> - Approaches and analytical tools to evaluate the implications of physical and transition risk on the stability of financial markets. - Overview of options for addressing these risks through existing macroprudential policy, including adjustments to instruments such as risks, capital requirements and disclosure.

Climate policy and fiscal policy	Fiscal risk	Fiscal risks from physical shocks	<ul style="list-style-type: none"> - Approaches and analytical tools to evaluate and manage the impacts of extreme weather events like floods, typhoons, heat waves and others on the fiscal position and sustainability of government finances. - Inclusion of extreme climate shocks in macroeconomic models. - Economic projections that include extreme climate shocks. - Assessment of the risk of extreme climate events.
		Fiscal risks from Green Swan events	<ul style="list-style-type: none"> - Approaches and analytical tools to evaluate and manage the impacts of green swans (profound market shift triggered by a change in mindsets, policies or attitudes) on the fiscal position and sustainability of government finances.
		Fiscal risks from climate and technology policy	<ul style="list-style-type: none"> - Approaches and analytical tools to evaluate and manage the impacts of climate policy and technological change on the fiscal position and sustainability of government finances. - Financial needs of climate policies and the sustainability of public finance.
		Fiscal risks from compound effects and cascading impacts	<ul style="list-style-type: none"> - Approaches and analytical tools to understand the compounding effects of multiple climate-related risks and the channels and scale through which these are spread throughout the economy and the financial sector. - Climate risk management in the economy and the financial sector.
		Climate change, climate policy and debt	<ul style="list-style-type: none"> - Approaches and analytical tools to evaluate and manage the impacts of climate change and climate change policy on balance of payments and debt.
	Financing needs and revenue strategies	Costing Long-Term Strategies	<ul style="list-style-type: none"> - Approaches, methods and analytical tools to estimate the cost of decarbonization pathways and climate resilient economies. - Assessment of adaptation costs. - Costs of the decarbonization pathway
		Dependence of public financing need on fiscal incentives	<ul style="list-style-type: none"> - Approaches and analytical tools to show how public financing needs can be reduced through comprehensive policy options. - Public financing needs.
		Efficient tax structures in the short and long run	<ul style="list-style-type: none"> - Approaches and methods to apply carbon pricing instruments in the longer term in the light of uncertainties relating to relative prices. - Green taxes.
		Revenue potential from pigouvian fiscal policies	<ul style="list-style-type: none"> - Overview and application of tools to evaluate the potential revenue from carbon taxes. - Taxes to other types of fuel.

Fiscal instruments for climate action	Sectoral Fiscal instruments	Fuel consumption	<ul style="list-style-type: none"> - Design and implementation of taxes applied to the consumption of fuels. - Approaches and analytical tools to evaluate effectiveness, efficiency and revenue generation.
		Fuel extraction	<ul style="list-style-type: none"> - Design and implementation of taxes applied to fossil fuel extraction as mechanisms to reduce emissions, and approaches. - Analytical tools to evaluate effectiveness, efficiency and revenue generation.
		Land uses	<ul style="list-style-type: none"> - Design and implementation of taxes applied to land conversion and land use as mechanisms to reduce emissions. - Approaches and analytical tools to evaluate effectiveness, efficiency and revenue generation.
		Non-fuel industrial emissions	<ul style="list-style-type: none"> - Design and implementation of taxes applied to industrial processes as mechanisms to reduce emissions. - Approaches, and analytical tools to evaluate effectiveness, efficiency and revenue generation.
		Fuel subsidy reform	<ul style="list-style-type: none"> - Approaches and analytical tools to undertake reform aimed at reducing inefficient subsidies and subsidies which promote emitting activities.
	Interaction effects of fiscal instruments with broader climate policy	<ul style="list-style-type: none"> - Methods and analytical tools to evaluate how fiscal instruments interact with other climate-related policies: emission and standards, in terms of efficiency, effectiveness and trade-offs in achieving climate outcomes and overall economic consequences. 	
Public and private green finance	Overview of initiatives	<ul style="list-style-type: none"> - Overview of initiatives for greening finance: global standards development, micro-prudential regulations and supervision, task forces on climate risk stress testing, nature-based accounting, green taxonomy, valuation, sustainable reporting, private sector initiatives. 	
	Micro-prudential regulations and supervision	<ul style="list-style-type: none"> - Climate risk and financial system regulation. 	
	Assessment of climate risks in financial systems	<ul style="list-style-type: none"> - Approaches, methods and analytical tools to identify, assess and monitor the relevant climate risks in financial systems (private and public). 	
	Integration of climate risks into monetary policy	<ul style="list-style-type: none"> - Analytical tools and practical examples on how climate risks assessment impacts monetary policy. 	
	Green Taxonomy development	<ul style="list-style-type: none"> - Overview and application of approaches to develop taxonomies to classify climate friendly investments. 	
	Sustainable Reporting	<ul style="list-style-type: none"> - Current global and regional initiatives for the disclosure of climate risk and their implementation at country level. 	
	Green financing instruments	<ul style="list-style-type: none"> - Principles for the design of instruments to promote climate action: bonds, credits, equity, fixed income, guarantee/insurance, investment funds. 	

	Role of private sector in green finance	- Policies, regulations and incentives for mobilizing private capital to support climate action.
Equity and just transition	Political economy of climate action	- Approaches to evaluate distributional impacts of environmental damages, climate policy, decarbonization pathways - Analytical tools to estimate the economic impact of slow onset climate change on the most vulnerable populations. - Mechanisms to address related opposition.
	Impacts of natural disasters on poverty and income growth	- Approaches, methodologies and analytical tools to estimate the economic impact of climate-related disaster on the most vulnerable populations. - Assessment of available policies and measures to reduce climate risk over vulnerable populations: self-protection, self-insurance and formal insurance.
	Equity and poverty impacts of tax/subsidy reforms to fuels	- Methodologies and analytical tools to estimate and manage the impact of carbon taxes and subsidy reform on welfare and impacts on the most vulnerable populations.
Industrial development and trade associated to climate change	Policy instruments for greening the industrial sector	- Methods and analytical tools to design policies whose aim is to promote innovation and adoption of climate friendly technologies, to encourage industries to adopt climate-related objectives. - Evaluate the interaction of different policies and their effect on the industry.
	Climate change impacts on trade	- Methods and analytical tools to estimate the effects of climate change on trade, including on evolving comparative advantages, productivity changes, and trade logistics and infrastructure.
	Impacts of trade on climate change	- Methods and analytical tools to evaluate emissions of trade and overview of mitigation policies and measures to reduce them.
	Trade policies and climate change	- Trade policies used by countries to level the playing field of trade and emissions: tariffs and non-tariff measures, carbon measurement and standards and trade agreements. - Methods and analytical tools to evaluate their impact on competitiveness.
	Implications of national and external climate policy for trade	- Methods and analytical tools to evaluate how national and international policies affect national competitiveness and generate opportunities for climate friendly trade. - Design of policies and measures to promote trade of climate friendly technologies.

Source: adapted from the curriculum attached in the Terms of Reference for the consultancy for *Analysis of Awareness and Capacity Gaps of Ministries of Finance in Latin America and the Caribbean Relating to a Whole of Economy Approach to Climate Change*.

Appendix 3: Questionnaire

Introducción

El siguiente cuestionario es una guía de entrevista que tiene como objetivo conocer de primera mano el rol del Ministerio de Hacienda de (país), su capacidad técnica y de personal actual, y los principales avances en el uso de las herramientas de economía para abordar los temas de cambio climático, así como los impactos de este fenómeno sobre la economía.

I. Instituciones

En esta sección buscamos indagar sobre el rol y capacidad del Ministerio de Hacienda y sus dependencias frente al cambio climático y la acción climática.

Rol del Ministerio de Hacienda con respecto al cambio climático

Marque cuáles de las siguientes son funciones del Ministerio de Hacienda (o equivalente) relacionadas con el cambio climático:

- Políticas de apoyo relacionadas con el cambio climático
- Marcos regulatorios de actividades económicas o mercados relacionados con el cambio climático
- Incentivos fiscales para finanzas verdes
- Elaboración y regulación de instrumentos financieros verdes
- Ninguna
- Otro(s): _____

¿Considera usted que el cambio climático se ha incorporado en los mandatos, responsabilidades y procesos internos del Ministerio? ¿Por qué?

- Ampliamente
- De manera suficiente
- De manera insuficiente
- No se ha incorporado

¿Existe un sistema nacional de cambio climático del cuál haga parte el Ministerio de Hacienda (o equivalente)? ¿Por qué?

- Existe y el Ministerio tiene voz y voto
- Existe y el Ministerio tiene voz, pero no voto
- Existe, pero el Ministerio no hace parte
- No existe

¿Considera usted que el Ministerio tiene una posición de liderazgo con respecto a otras entidades en temas relacionados con el riesgo climático?

- Totalmente de acuerdo
- De acuerdo
- En desacuerdo
- Totalmente en desacuerdo

Reforma de la arquitectura institucional para una acción climática sostenida

¿Considera que la estructura institucional actual atiende la necesidad para incluir políticas climáticas en el quehacer del Ministerio? ¿Por qué?

- Totalmente
- De forma suficiente
- Se ha avanzado, pero no de forma suficiente
- Deficiente

En caso de haber respondido “c” o “d” en la pregunta anterior. ¿Por qué considera que la estructura es insuficiente o deficiente?

¿Existe un equipo especializado capacitado en temas climáticos? ¿Por qué?

- Suficiente y capacitado
- Suficiente con capacitación por debajo de la necesaria
- Insuficiente y capacitado
- Insuficiente y con capacitación por debajo de lo necesario
- No hay un equipo especializado.

En caso de haber respondido “b” o “d” en la pregunta anterior. ¿Por qué considera que no es un equipo lo suficientemente capacitado?

En caso de haber respondido algo diferente a “e” en la pregunta número 7. ¿Es este un equipo *ad hoc* para abordar estos temas o hace parte de las dependencias del Ministerio?

- Es un equipo ad hoc
- Hace parte de las dependencias del Ministerio
- No hay un equipo especializado

Gestión del gasto público para la acción climática

¿Cuáles de los siguientes métodos para incorporar las políticas climáticas en el gasto público se utilizan?

- Procedimientos de asignación del gasto público que prioricen la infraestructura verde y resiliente
- Rastreo de gasto público asignado a las políticas climáticas
- Contratación pública que priorice la inversión con enfoque ambiental
- Ninguno
- Otro(s): _____

Reformas a las empresas estatales

Considera que las empresas estatales tienen estrategias para afrontar la vulnerabilidad ante el cambio climático. ¿Por qué?

- Totalmente de acuerdo
- De acuerdo
- En desacuerdo
- Totalmente en desacuerdo

Considera que las empresas estatales tienen estrategias para reducir las emisiones de Gases de Efecto Invernadero. ¿Por qué?

- Totalmente de acuerdo
- De acuerdo
- En desacuerdo
- Totalmente en desacuerdo

II. Riesgo fiscal y espacio fiscal

La presente sección tiene como objetivo indagar por la preparación del Ministerio para afrontar riesgos fiscales existentes como consecuencia del cambio climático.

Riesgo fiscal

¿Considera que en el Ministerio el cambio climático se reconoce como una fuente importante de inestabilidad fiscal y/o financiera?

- Totalmente de acuerdo
- De acuerdo
- En desacuerdo
- Totalmente en desacuerdo

¿Ha sido el cambio climático incluido en la regla fiscal como una variable que afecta el presupuesto (desde el punto de vista tanto del recaudo como del gasto) y las estimaciones de crecimiento socioeconómico del país? ¿Por qué?

- Sí
- No

Marque cuáles de los siguientes estudios se han utilizado por parte del Ministerio de Hacienda (o equivalente) en la toma de decisiones o en el diseño de políticas. ¿Cuál entidad fue responsable de realizar estos estudios?

- Efectos económicos y sociales del cambio climático
- Costos asociados al cambio climático, incluyendo canales y posibles efectos domino
- Análisis del impacto de los riesgos climáticos en la estabilidad de los mercados
- Impactos macroeconómicos del cambio climático
- Impacto macroeconómico de las metas de mitigación de emisiones
- Impacto macroeconómico de las medidas de adaptación
- Ninguno
- Otro(s): _____

¿Los modelos macroeconómicos y financieros usados en el Ministerio han sido actualizados para incluir alguno de los siguientes elementos?

- Choques climáticos extremos⁶

⁶ Situaciones extremas relacionadas con el clima que se ubican dentro del rango de eventos esperados.

Eventos climáticos extremos⁷ (Green Swan Events)
Puntos de inflexión climática⁸ (i.e. migración climática o conflicto interno)
Catástrofes naturales
Cambios en la biodiversidad
Deterioro de los ecosistemas
Ninguno
Otro(s): _____

Si en la anterior pregunta seleccionó más de un elemento, ¿se incluyen en los modelos macroeconómicos análisis combinados o efectos en cascada de estos elementos?

Sí
No

¿Considera que estos modelos macroeconómicos y financieros que incluyen elementos relacionados con el cambio climático requieren de un mayor refinamiento metodológico? ¿Por qué?

¿Cómo ha cambiado el presupuesto asignado a las acciones de mitigación y adaptación al cambio climático en los últimos años (en términos reales)?

Ha aumentado
Se redujo únicamente por motivo de la pandemia
Se ha reducido por más motivos, además de la pandemia
Se ha mantenido igual

¿En el Ministerio se utilizan alguno de estos estudios para el análisis y definición de política respecto al cambio climático? ¿Cuál entidad fue responsable de realizar estos estudios?

Estudios sobre políticas públicas climáticas vs escenario Business As Usual
Afectación del cambio climático en la balanza de pagos y la deuda externa
Afectación de las políticas climáticas en la balanza de pagos y la deuda externa
Deuda externa como instrumento para financiar políticas climáticas
Alivio a la deuda externa por desempeño ambiental
Relación entre las necesidades de financiamiento de las políticas climáticas y la sostenibilidad de las finanzas públicas
Curvas de costos marginales de abatimiento (MACC, por sus siglas en inglés)
Ninguno
Otro(s): _____

Necesidades de financiamiento y estrategias de recaudo

¿Cuenta el Ministerio de Hacienda (o equivalente) con estimaciones del costo de la estrategia del país para la descarbonización de largo plazo o de sus Contribuciones Determinadas a Nivel Nacional (NDC, por sus siglas en inglés)?

Costo de la estrategia de descarbonización de largo plazo

⁷ Un evento muy extraño e inesperado con un impacto desproporcionado y que no puede ser explicado o predicho antes de que ocurra.

⁸ Eventos que llevan la situación climatológica de un estado estable a otro estado también estable luego de un periodo de transición.

Costo de la NDC

Ambas

Ninguna

¿Cuáles de los siguientes análisis de costos se han realizado?

Necesidades de adaptación

Necesidades de mitigación

Costos de transición justa⁹

Descarbonización

Carbono-neutralidad

Ninguno

Otro(s): _____

III. Instrumentos fiscales para la acción climática

En esta sección se abordarán instrumentos fiscales en elaboración o en implementación utilizados como medidas para contribuir a la acción climática.

Instrumentos fiscales sectoriales

¿Cuáles de estos impuestos relacionados con el cambio climático existen en el país?

Impuestos al consumo de combustible

Impuestos a la importación o extracción de combustibles.

Impuestos al cambio en el uso del suelo

Impuestos a las emisiones industriales diferentes a los impuestos al combustible

Impuestos a los productos contaminantes

Impuestos a plásticos de un solo uso

Impuesto al carbono

Impuesto a la madera

Ninguno

Otro(s): _____

¿Se han realizado estudios o diagnósticos para implementar nuevos impuestos relacionados con el cambio climático? ¿Cuál es la entidad encargada de realizar estos estudios?

Sí

No

¿Se ha considerado alguno de los siguientes instrumentos como complemento a los impuestos relacionados con el cambio climático existentes?

Incentivos fiscales

Regulaciones

Subsidios

Ninguno

Otro(s): _____

⁹ Puesta en marcha de la transición energética sin afectar de sobremanera a nadie y suavizando los impactos para los más afectados.

¿En cuáles de los siguientes sectores existen subsidios a actividades económicas que tienen una alta emisión de Gases de Efecto Invernadero?

- Minería
- Energía con fuentes fósiles
- Combustibles fósiles
- Transporte de carga con combustibles fósiles
- Plásticos
- Ninguno
- Otro(s): _____

¿Para cuáles de los siguientes sectores existen incentivos fiscales?

- Producción de energías renovables (solar, eólica, etc.)
- Producción y/o uso de autos eléctricos
- Uso de transporte público
- Uso de transporte masivo
- Uso de transporte compartido (*carpooling*)
- Utilización de materiales biodegradables o reutilizables
- Reciclaje
- Ninguno
- Otro(s): _____

Interacción de efectos de instrumentos fiscales con políticas climáticas más amplias

Indique el grado de utilización de estudios o análisis de los efectos no esperados de instrumentos o políticas climáticas, o de su interacción con otras políticas. ¿Cuál es la entidad encargada de realizar estos estudios?

- Se usan los estudios completamente
- Se usan parcialmente
- No se usan
- No hay estudios

¿Se han realizado estudios de *trade-off* entre objetivos económicos y climáticos? ¿Cuál es la entidad encargada de realizar estos estudios?

- Se usan los estudios completamente
- Se usan parcialmente
- No se usan
- No hay estudios

IV. Finanzas verdes públicas y privadas

En esta sección se busca un acercamiento del rol del Ministerio de Hacienda y/o Banca Central en la dinámica de la movilización de recursos y herramientas para las finanzas verdes en el sector público y privado.

Revisión de iniciativas

¿Cuáles de las siguientes iniciativas se han considerado para avanzar en la transición a las finanzas verdes?

Regulaciones y supervisión
Cuentas ambientales¹⁰
Taxonomía verde¹¹
Informes de sostenibilidad
Ninguno
Otro(s): _____

¿Existen proyectos de Asociación Público-Privada para cumplir las metas de mitigación de GEI (Gases de Efecto Invernadero) y de adaptación al cambio climático del país?

Sí
No

Sistemas financieros: regulación, supervisión y evaluación de riesgos climáticos

¿Cuáles de las siguientes herramientas de regulación y supervisión del sistema financiero se utilizan para cumplir las metas de mitigación y adaptación al cambio climático?

Monitoreo y regulación de riesgo asociado al cambio climático
Guías del *Basel Committee on Banking Supervision*
Guías del *International Association of Insurance Supervisors*
Guías del *International Organization of Securities Commissions*
Sistemas de Monitoreo, Reporte y Verificación de las finanzas verdes
Ninguna
Otro(s): _____

¿A quién le corresponde el riesgo monetario asociado a variables de cambio climático en una Asociación Público-Privada?

Al privado
Al Estado
Son compartidos

¿Qué tan desarrollada está la regulación macro-prudencial¹² y micro-prudencial¹³ con relación a la supervisión del riesgo climático en la inversión privada?

Mucho
Algo
Poco
Nada

Finanzas Públicas Verdes

¹⁰ Sistema de medición y análisis que permite comprender la interacción entre el ambiente y el circuito económico.

¹¹ Sistema de clasificación de las actividades económicas que corresponden a compromisos o estrategias ambientales.

¹² Regulación financiera dirigida a mitigar el riesgo del sistema financiero.

¹³ Supervisión financiera por parte de los reguladores de las instituciones financieras a las empresa para monitorear qué tan sólidos son los balances de las empresas en presencia de perturbaciones.

Marque cuáles de las siguientes herramientas utiliza el Ministerio para lograr objetivos de la política climática, las Contribuciones Determinadas a Nivel Nacional (NDC por sus siglas en inglés) o estrategias de descarbonización:

- Taxonomía de clasificación en las inversiones climáticas
- Incentivos a la implementación de finanzas verdes
- Instrumentos financieros especializados del mercado financiero o de capitales
- Alianzas Público-Privadas para las iniciativas de mitigación o adaptación
- Cofinanciación del sector privado
- Inversionistas locales e internacionales
- Ninguna
- Otra(s): _____

Desarrollo de la Taxonomía Verde

- ¿Se tiene una taxonomía de clasificación en las inversiones climáticas?
- Ya está siendo implementada
- Está en proceso de implementación
- Se han hecho estudios, pero no se ha implementado
- No se cuenta con una taxonomía de clasificación

Informes de sostenibilidad

¿Han participado en iniciativas globales o regionales para la divulgación de informes de sostenibilidad y la implementación de estos? ¿Cuáles?

- Sí
- No

Instrumentos de financiación verde

¿Cuáles de los siguientes instrumentos de financiación verde se han usado para aportar a las metas climáticas del país?

- Bonos temáticos (verdes, azules, naranja)
- Líneas de crédito verde
- Mercado de acciones verdes
- Mercado de renta fija verde
- Seguros verdes
- Fondos de inversión en financiación verde
- Vigencias futuras en proyectos verdes
- Ninguno
- Otro(s): _____

Rol del sector privado en la financiación verde

- ¿Qué tan involucrado y comprometido está el sector privado en el financiamiento de los objetivos climáticos?
- Mucho
- Algo
- Poco
- Nada

V. Cambio social y transición justa

En esta sección queremos conocer si el Ministerio de Hacienda (o equivalente) ha comenzado a estudiar la relación entre cambio climático, las políticas climáticas del país y la distribución del ingreso en la población.

Economía política de la acción climática

A la hora de tomar decisiones de política pública relacionadas con la acción climática ¿Se tienen en cuenta los ganadores y perdedores en el mercado laboral de esta acción climática para establecer mecanismos de compensación? ¿Por qué?

Sí

No

Impactos distributivos de los daños medioambientales

¿Cómo califica los efectos distributivos¹⁴ de las políticas climáticas? ¿Por qué?

Progresivos

Neutrales

Regresivos

No determinados

¿Cuáles de los siguientes estudios se han utilizado por parte del Ministerio de Hacienda (o equivalente)? ¿Cuál es la entidad encargada de realizar estos estudios?

El impacto de catástrofes naturales en la pobreza y desigualdad

El impacto de catástrofes naturales en el crecimiento de la economía

El impacto de catástrofes naturales en el sistema financiero

Los riesgos climáticos a los cuales están expuestos una población y/o una ubicación determinada

La vulnerabilidad climática de la población de escasos recursos

Ninguno

Otro(s): _____

Cuantificar y abordar las carencias de competencias de la transición justa

¿El país cuenta con un plan o estrategia para una transición justa?

No

Está en construcción

Sí

Sí y se está implementando

¿Con que herramientas se cuenta para calcular los costos económicos, sociales y ambientales asociados a la transición justa?

Impacto de las catástrofes naturales en la pobreza y el crecimiento de la renta

¿Qué tanto se han estimado los costos económicos, sociales y ambientales derivados de una catástrofe natural?

¹⁴ Efectos sobre los diferentes grupos sociales, diferenciados según su nivel de gasto o de renta.

Mucho
Algo
Poco
Nada

¿Qué tan preparado está el sector financiero y asegurador para contribuir a reducir el impacto ante una catástrofe natural?

Mucho
Algo
Poco
Nada

Reducir el impacto del riesgo climático en los pobres

Señale qué tan de acuerdo está con esta afirmación: La población más expuesta a los riesgos climáticos cuenta con una protección prioritaria en las políticas de emergencia climática. ¿Por qué?

Muy de acuerdo
De acuerdo
En desacuerdo
Muy en desacuerdo

Impactos de las vías de transición

¿Cuáles de los siguientes estudios se han realizado o se han utilizado por parte del Ministerio de Hacienda (o equivalente)? ¿Cuál es la entidad encargada de realizar estos estudios?

El impacto de la descarbonización o de economía más resiliente al clima en la población que trabaja en sectores económicos contaminantes (i.e. el sector minero)

El impacto de la descarbonización o de economía más resiliente al clima en la pobreza y desigualdad

El impacto de la descarbonización o de economía más resiliente al clima en variables macroeconómicas (desempleo, inflación, crecimiento)

El impacto en la equidad y la pobreza de las reformas fiscales y de subvenciones a los combustibles

Ninguno

Otro(s): _____

¿Qué tanto se ha estudiado cómo las subvenciones a los combustibles afectan la pobreza y desigualdad?

Se tienen estudios concluyentes
Se tienen estudios, pero no concluyentes
No se tienen estudios, pero se planea hacerlos
No se tienen estudios y no se planea hacerlos

VI. Comercio y cambio climático

Esta sección busca recoger información sobre la relación existente entre el comercio y el cambio climático y qué tanto se involucra el Ministerio en esto.

¿Es el comercio uno de los sectores priorizados en acuerdos internacionales sobre cambio climático y/o en políticas nacionales de cambio climático? ¿Por qué?

Sí
No

¿Cuáles de los siguientes estudios se utilizan por parte del Ministerio de Hacienda (o equivalente) en la toma de decisiones o en el diseño de políticas? ¿Cuál es la entidad encargada de realizar estos estudios?

Impacto del cambio climático en el comercio
Impacto del comercio en el cambio climático
Efecto de políticas nacionales e internacionales climáticas en la competitividad
Análisis comparativos de tecnologías más amigables con el ambiente en el comercio
Estimación de costos de una matriz intermodal de transporte más limpia
Implicación de las políticas nacionales e internacionales climáticas en el comercio internacional
Identificación de importaciones asociadas a una alta emisión de Gases de Efecto Invernadero que sean representativas en términos del Producto Interno Bruto
Identificación de exportaciones asociadas a una alta emisión de Gases de Efecto Invernadero que sean representativas en términos del Producto Interno Bruto
Estimación de los costos asociados a la capacidad de adaptación del comercio frente a los cambios en el mercado global
Ninguno
Otro(s): _____

¿Se han adquirido compromisos internacionales de comercio más limpio y justo? ¿Cuáles?

Sí
No

VII. Política industrial e innovación

En esta sección queremos indagar sobre el rol que ha tenido el Ministerio en el diseño de políticas que promuevan la innovación y la adopción de tecnologías limpias en la industria.

¿El Ministerio de Hacienda (o equivalente) participa en alguna iniciativa para promover tecnologías limpias o amigables con el medio ambiente en la industria? ¿Cuáles?

Sí
No

Appendix 4: Model Interview Interview

Introduction

This interview is part of the Climate Economics Capacity Building Initiative project, led by the World Bank's Climate Economics Team. The main objective of this exercise is to understand how climate change is linked to the macroeconomic policy within the MINISTRY OF FINANCE. To this end, the interview has 5 sections: i) institutional framework of the Ministry and the inclusion of climate change in it, ii) climate change and its connection with the country's fiscal policy, iii) climate policies and their connection with the country's fiscal policy, iv) existing fiscal instruments for climate action¹⁵, and v) green finance.

It is important to clarify that this interview should not be taken as an evaluation of the Ministry's capabilities, but rather as an indicator for the World Bank of how well climate change is incorporated into the country's macroeconomic policy and what are the issues of interest in the region and in each country. Subsequently, to design an appropriate technical assistance program that will benefit all countries in the region based on the information gathered in this interview. The technical assistance program to be developed by the World Bank will address macroeconomic policy issues, financial risk, among others, and their link to climate change.

Duration

The interview has a maximum duration of one hour.

Consent to record the interview

To be able to listen carefully during the interview and to be able to consult the conversation later throughout the studio, we would like to ask you if it is possible to record the interview.

Institutions

This section seeks to inquire about the level of awareness within the MINISTRY OF FINANCE regarding the implications of climate change in the Ministry's endeavor and its role in contributing to climate action. Therefore, it asks about the current Ministry's technical capacity, the gaps and the needs to be addressed in order to integrate climate change in a cross-cutting manner in the Ministry's mandate.

- 1. Does the Ministry have a comprehensive mandate or strategy to address climate issues?**
- 2. Is there a specialized team with technical capacity to address climate action within the Ministry? Are all responsibilities attributed to it, or is it a cross-cutting work within the Ministry?**

¹⁵ Climate action means the adoption of urgent policies, programs, and measures to reduce greenhouse gases, build resilience to climate change and finance climate objectives to combat climate change and its effects (Acción Climática Latinoamericana, United Nations).

- 3. How climate change and/or climate policies are incorporated in decision making, economic and financial models, national budget, public procurement, investments, among others?**
- 4. Does the Ministry rely on external entities for studies, seek advice or obtain climate policy recommendations?**
 - a. Is it an entity completely independent from the central government, a university, a research center, an internal committee (fiscal rule committee)?

Climate Change and Fiscal Policy

This section aims to explore the implications of climate change and climate action on the economic, fiscal and financial stability of COUNTRY. To this end, it asks whether the Ministry considers climate change as an important source of potential fiscal and financial instability, and how prepared the Ministry is to face fiscal risks derived from climate change and the financing needs of climate policies. It also asks about the incorporation of climate change in the estimates of macroeconomic and social variables, among others, to be able to address and manage these fiscal risks from the Ministry.

- 5. Have the macroeconomic models (growth, deficit, external debt) used in the Ministry been updated with key elements associated with climate change?**
 - a. For example: extreme weather events¹⁶, green swan events¹⁷, natural disasters.
 - b. Has external debt been considered as an instrument to finance climate policies or as external debt relief based on environmental performance?
 - c. Are compound effects and cascading impacts of climate change elements included in macroeconomic models?
- 6. How does the Ministry estimate the effects that climate change may have on poverty and inequality?**
- 7. (Optional) Have climate change elements been integrated into monetary policy?**
- 8. (Optional, in the case the Ministry has a financial role) What methods or analytical tools are used to identify, assess and monitor climate risks in the financial system?**
 - a. How developed is the macro-prudential¹⁸ and micro-prudential¹⁹ regulation in relation to climate change oversight in private investment?

Climate Policy and Fiscal Policy

¹⁶ Extreme weather-related situations that are above or below the expected threshold, e.g., cold waves, heat waves, fires, storms and floods (CEPAL, 2020).

¹⁷ A very strange and unexpected event with a disproportionate impact that cannot be explained or predicted before it occurs (The Green Swan Initiative, 2021).

¹⁸ Financial regulation aimed at mitigating financial system risks (BBVA Research, 2021).

¹⁹ Financial oversight by financial institution regulators of companies to monitor how strong companies' balance reports are in the presence of shocks.

This section seeks to understand how the actions being taken within the framework of climate and environmental policy affect the country. More specifically, it seeks to understand how the Ministry incorporates the costs (or cost overruns) associated with having environmentally friendly policies. To this end, we will ask about the connection between the costs of having climate policies and the fiscal stability of the country, as well as the effects of these policies on poverty and inequality. Additionally, we will ask about the just transition²⁰ and its effects on these variables.

9. How is climate change included in the budgeting process and its allocation?

- a. For example, climate criteria for project prioritization or a budget tracker for climate issues.

10. How are the costs of climate policies estimated? How does the Ministry incorporate the costs of these climate policies into fiscal policy without affecting their sustainability in the short and medium term?

- a. Climate policies for mitigation and adaptation to climate change, Nationally Determined Contributions (NDCs), carbon neutrality.

11. Does the Ministry have any tool to calculate the impacts associated with climate policies on the economy and polluting economic sectors (mining sector, oil sector)?

- a. Does the Ministry have measures of how much the adoption of these climate policies may affect the balance of payments and debt? Have the imports and exports with high Greenhouse Gas emissions that are representative in terms of Gross Domestic Product been identified?

12. How does the Ministry incorporate the effects that climate policies may have on poverty, unemployment and inequality?

- a. Do you have a tool to calculate the economic, environmental and social costs associated with just transition?
- b. Have the distributional impacts²¹ of climate policies been analyzed? Are they progressive, regressive or neutral?
- c. Does the people most exposed to climate change have priority protection in climate emergency policies?

Fiscal Instruments for Climate Action

This section will address the fiscal instruments implemented or under development that contribute to climate action. It will also explore fiscal incentives as a tool for reducing Greenhouse Gas emissions in the sectors with the greatest impact, and how these tools could have an impact on poverty and inequality.

13. What green taxes exist in the country and are there studies for the implementation of other types of instruments related to climate action?

²⁰ Implementation of the energy transition without greatly affecting anyone and softening the impacts for those most affected.

²¹ Effects on different social groups, differentiated according to their level of expenditure or income.

- a. For example: tax disincentives to deforestation, extensive cattle ranching; carbon taxes, taxes on consumption, import or extraction of fuel, industrial emissions or polluting products, single-use plastics.

14. Are there any subsidies, exemptions, compensations, etc. for economic activities with high Greenhouse Gas emissions?

- a. For example: mining, energy with fossil sources, fossil fuels, freight transportation with fossil fuels.

15. Have the negative consequences in terms of poverty and inequality of a possible elimination of fuel subsidies been studied?

16. Are there tax incentives for environmentally friendly activities and have other tax incentives been considered for implementation in the short or medium term?

- a. For example: production of renewable energies (solar, wind, etc.), production and/or use of electric cars, car-pooling, use of mass transportation, recycling.

Public and Private Green Finance

Next, we seek to investigate the role played by the MINISTRY OF FINANCE in the dynamics of resource mobilization, the economic tools linked to green finance, and the regulation and supervision of this market. In addition, it seeks to know the involvement of the private sector, and the participation of the financial and insurance sector in the financial market regarding climate-related risks.

17. Strengthening green finance and private participation in this matter is a fundamental issue for climate action. What green finance instruments have been used in this regard? What role does the Ministry have with respect to these?

- a. For example: Bonds (green, blue, orange), credits, fixed income, insurance, investment funds
- b. What is the entity in charge of regulating and supervising these processes?

18. (Optional, in case the country does not have a taxonomy) Have there been any efforts to develop a taxonomy for the classification of climate investments (Green Taxonomy²²)? How advanced is the taxonomy?

Institutions (optional)

This section addresses the issue of climate governance and the level of involvement of the MINISTRY OF FINANCE in it.

19. How are the different ministries articulated to carry out joint policies on climate issues?

- a. Is there a national climate governance system of which the Ministry is a member? What is the Ministry's role in this system?

²² Classification system of economic activities that correspond to environmental commitments or strategies.

- b. Is there any coordination with the Central Bank on these issues?

20. How have the state-owned companies been involved in climate action?

- a. What strategies do they have to address their vulnerability to climate change and/or to reduce their Greenhouse Gas emissions?
- b. In this regard, what reforms to state-owned enterprises have been implemented in recent years or are in the process of being implemented?

Final Section

- 21. In which environmental issues do you consider that the Ministry has its greatest strengths? Of these, are there any that you think should be taken up by the World Bank when developing the course?**

- 22. What topics would you like to learn about in the course? Where do you see the greatest opportunity to implement climate policy in the Ministry?**

Annex 5: interviews summary

Questions	Chile (Pilot)	Colombia (Pilot)	Colombia	Jamaica	Brazil	Costa Rica
Institutions						
Does the Ministry have a comprehensive mandate or strategy to address climate issues?	Ministries should have a role in topics such as energetic transition, and carbon taxing.	Due to the ministry's objective of supervising growth, budget, risks, and finances, and given that climate issues affect these factors, the ministry takes into account climate change in order to grow with quality and not at any cost. But the ministry doesn't have a comprehensive mandate.	An integrated approach to climate change does not exist within the ministry. From the perspective of the institution and its departments, there is no coordination on the climate issue, and some things have been done in an isolated and very particular way.	The ministry incorporates climate change through national budget strategies, public investment .	Climate change is a cross cutting issue in the ministry, different areas work for this. For example, economic policy, budget and more. Main issue is carbon market, the priority.	There is no regulatory framework as such, it has been incorporated by practice and not by a formal organizational unit, but in various units of the ministry where several actors participate.

<p>Is there a specialized team with technical capacity to address climate action within the Ministry? Are all responsibilities attributed to it, or is it a cross-cutting work within the Ministry?</p>	<p>There should be a specialized group in the ministry, in the department of international finances. One or two people is enough.</p>	<p>Not at this moment, in the structure of the ministry there is no role for green issues.</p>	<p>No. The technical team could model it, although it's not their strong suit because they focus more on macro models.</p>	<p>No, it is an external division and attends Climate Change transversally.</p>	<p>There is a technical group to talk about climate change in a governance level. The main goal is to implement the carbon market in Brasil. Economic ministry is in charge of coordinating this group. Is an inter-ministerial group: environmental ministry, foreign relations ministry, energy ministry.</p>	<p>No, the work is distributed among different units of the ministry.</p>
<p>How climate change and/or climate policies are incorporated in decision making, economic and financial models, national budget, public procurement, investments, among others?</p>	<p>It is not optimal to centralize everything, it is better to include in a more cross-sectional way.</p>	<p>Finance ministry in Colombia is a high-level institution and it is connected with other agencies and other sectors, especially the technical deputy finance minister, which made things easier.</p>	<p>Already answered in the pilot.</p>	<p>Each year they advise and estimate costs of Climate Change needs, Caribbean organizations provide budget to cover these costs and the fiscal policy includes a disaster section to cover the</p>	<p>Recently in Brazil, the economics ministry created a new area: green economy sub direction. Is a new structure responsible for organizing all policies on climate change in Brasil. They have help from other ministries</p>	<p>There are several ways in which this has occurred: fiscal risks from natural disasters have been incorporated into reports and macro-fiscal estimates. There is a methodological guide for budget markers on climate issues, it would be</p>

				costs of impacts of Climate Change.	like environmental or energy, but the economic policies linked to climate change are assigned to this area.	developed in the 2024 budget. Analysis has been made to incorporate green taxation, in taxation issues: fuel taxes, review of exemptions, etc.
Does the Ministry rely on external entities for studies, seek advice or obtain climate policy recommendations?	Not asked	No, Finance Ministry does everything inhouse. For the issuance of the bond, they had expert consultants from the IDB but everything was done in the ministry	Depending on the needs, resources such as technical expertise and consultancy contracts have been sought. From the office of the technical deputy minister, cooperation resources for environmental issues are being sought, which were not so much within their jurisdiction or analysis before, but are increasingly	No, the calculation of scenarios and analysis for the cost are in-house.	Yes: NGOs, associations, federations, think tanks, universities and consulting firms.	There has been assistance from multilaterals and other agencies of bilateral support.

			relevant due to the current global situation and government interest.			
Climate Change and Fiscal Policy						
Have the macroeconomic models (growth, deficit, external debt) used in the Ministry been updated with key elements associated with climate change?	Not asked	No, there was a pilot to incorporate new elements. Finance ministry has a short-term view to 10 years which makes it difficult to include climate change elements.	It's something that is evaluated from a risk perspective, what other risks could happen that could affect us. One of the challenges is how to incorporate it into the models, as there is no macro environmental block, and it is a significant challenge.	Strategies are correlated to the possible impacts on the budget and some studies and tools account for risks and characterization of the natural events in terms of magnitude and cost.	There are no economic models to assess the impacts of climate change in fiscal policy and other elements that connect with fiscal policy.	Public policy decisions are made based on a diagnosis and analysis to position the climate agenda in the ministry. Some actions have been advanced in the revision of fuel taxes, analysis of green taxes and incorporation of methodological guidelines on the formulation of climate action projects. It is necessary to analyze how

						the fiscal policy reacts to what is being generated.
How does the Ministry estimate the effects that climate change may have on poverty and inequality?	Not asked	Not asked as no information was provided in the previous question.	Not asked as no information was provided in the previous question.	The Planning Institute assume the macroeconomic variables like poverty and equality.	For carbon markets or carbon pricing it is easier, as there was a plan from 2020 to assess Brazil in these topics: risk analysis, impact assessment and sectorial impact. It is unsure if incentives have the same instruments	Not asked as no information was provided in the previous question.

Have climate change elements been integrated into monetary policy?	Not asked	The ministry has no direct inference in monetary policy.	The ministry has no direct inference in monetary policy.	The ministry has no direct inference in monetary policy.	The ministry has no direct inference in monetary policy.	The Central Bank is generating an environmental account dedicated solely to this topic in order to make the input-output matrix of this topic part of the national accounts. The initiative is known as Wave.
Climate Policy and Fiscal Policy						
How is climate change included in the budgeting process and its allocation?	Not asked	As there are currently no proposed climate change projects, no budget can be allocated.	Through Green Bonds. The IDB helped them with the elaboration of the bond and the issuance of projects. These green bonds have to be aligned with the budget.	Contingencies and disasters have a fund in the budget.	Not answered.	Not asked.
How are the costs of climate policies estimated? How does the Ministry incorporate the costs of these climate policies into fiscal policy without affecting their	Not asked	Not asked.	In the aggregate items of the budget, just like in fiscal policy, but it is not a priority.	Not asked	Not answered.	Not answered.

<p>sustainability in the short and medium term?</p>						
<p>Does the Ministry have any tool to calculate the impacts associated with climate policies on the economy and polluting economic sectors (mining sector, oil sector)?</p>	<p>Not asked</p>	<p>The costs of implementing the NDC are assessed to determine how ambitious they can be and to see what is economically feasible.</p>	<p>No, first we need to build a multisectoral model for climate change. Part of the economic policy is in DNP, and they have a more robust climate agenda, with a sub-direction of environment that has macro models with environmental components.</p>	<p>They consider different scenarios and the most affected sector is the agriculture .</p>	<p>Not answered.</p>	<p>For many years Costa Rica has had an energy matrix that is very much oriented towards renewables and today does not represent a large investment. The main challenge now is the transportation sector: it is necessary to modernize and electrify it and this does imply a large investment. In the other major generators of emissions (livestock, agriculture) much progress has been made in NAMAs (Nationally Appropriate Mitigation Action).</p>

<p>How does the Ministry incorporate the effects that climate policies may have on poverty, unemployment and inequality</p>	<p>Not asked</p>	<p>The effects on poverty and inequality are analyzed in a specific manner and are part of the climate analysis to determine the cost of doing nothing.</p>	<p>Already asked in pilot.</p>	<p>Global behavior changes are in charge of the central bank.</p>	<p>Not answered.</p>	<p>The statistics unit has a multidimensional measurement of poverty and includes some climate change issues. The evolution of poverty includes climate change effects.</p>
<p>Fiscal Instruments for Climate Action</p>						
<p>What green taxes exist in the country and are there studies for the implementation of other types of instruments related to climate action?</p>	<p>Tax carbon is low in general, there is a need for international cooperation, as reducing individually would result in loss of competitiveness</p>	<p>Covered in desktop review</p>	<p>They have not done a big research process; it depends on what is needed in the different tax reforms.</p>	<p>Climate division has been working on implementing green taxes.</p>	<p>There are no green taxes in Brazil. There is a contribution in all fields, but now is 0 because the price of fuel is very high. There is state tax on fuel that represents 10B dollars per year.</p>	<p>There is a tax on fuels. Another tax that has been well accepted is a tax on car emissions, but one concern is that it would be highly regressive because only old cars would pay. There are subsidies for the importation of electric cars, both in terms of imports and property taxes.</p>

<p>Are there any subsidies, exemptions, compensations, etc. for economic activities with high Greenhouse Gas emissions?</p>	<p>No. There should be a green test for investment projects in general, demanding some standards in the preservation of the environment.</p>	<p>Not asked.</p>	<p>There are subsidies and the structure makes it very difficult to remove them due to social impacts and inflation.</p>	<p>There is a subsidy on kerosene oil. There is not subsidy to final gas prices.</p>	<p>Brazil is known for being a powerhouse in the agriculture sector and there are many incentives for agriculture in the sector.</p>	<p>There is the Payment for Environmental Services for the alternative use of the farms of forest owners; it is a subsidy in exchange for a commitment not to deforest and has been extended to biodiversity issues. In solar energy there are initiatives so that private companies that want to switch to solar energy can sell the surplus and are connected to the electricity line, it is managed by the national electricity institute.</p>
<p>Are there tax incentives for environmentally friendly activities and have other tax incentives been considered for implementation in the short or medium term?</p>	<p>Not asked</p>	<p>Not asked.</p>	<p>There is a significant item on carbon tax in the current tax reform. The reform aims to expand the carbon tax to coal, as well as impose</p>	<p>Covered in desktop review</p>	<p>Covered in desktop review</p>	<p>Covered in desktop review</p>

			taxes on single-use plastics.			
Public and Private Green Finance						
What green finance instruments have been used in this regard? What role does the Ministry have with respect to these?	In 2019 Chile issued the first green sovereign bond of Latin America, since then a total of 16 billion dollars have been issued in this regard (16% of total debt)	Different budget and financing tools from public, private, and international sources have been used. Colombia's green taxonomy allows for aligning these three sources. There are also various funds, green bonds, the green bond issuance framework, sustainability link bonds, etc.	The instruments are green bonds within the local framework or the social bonds framework.	There is a catastrophe bond and the Inter-American development Bank offers support.	Brazil has recently launched CPR green bond to finance sustainable and conservative projects. Is expected to receive 5B dollars in 2 years to finance projects in the amazon. But this is an isolated initiative, as there is not a green taxonomy in Brazil to classify the bonds.	The Central Bank of Costa Rica has issued green bonds at the international level and they are working on the general framework for issuing thematic bonds at the international and local level. The bonds have moved more by the country brand, not by the bond brand. There are financial entities that have ventured into green alternatives and banks have access to green resources so that they can finance green projects: e.g., sustainable housing.

Final Section

<p>In which environmental issues do you consider that the Ministry has its greatest strengths? Of these, are there any that you think should be taken up by the World Bank when developing the course?</p>	<p>Not asked</p>	<p>Since all the teams are new and the topics take time to understand, there is an opportunity for the course to be comprehensive and not too advanced. It is different to talk about income tax compared to carbon tax, and the topic of physical and transition risks should be clearly understood.</p>	<p>The ministry has a very important technical aspect, and thinking about how the issue of climate change can be incorporated into macro models. It would be very useful to have better tools to simulate impacts and design climate policies to know their impact on debt. They have shared experiences with other countries, so it is very useful to learn how others went through the process of designing instruments.</p>	<p>Everything starts with an appreciation for running a sustainable budget, without that nothing can effectively take place.</p>	<p>The ABC plan in agriculture. Development of Carbon Markets. Small initiative for sustainable growth. Innovation and startups for green projects.</p>	<p>Costa Rica's experience with the decarbonization policy is a reference at international level, as well as in payment for environmental services that can be shared with other countries in the region.</p>
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Annex 6: necessities summary

Questions	Chile (Pilot)	Colombia (Pilot)	Colombia	Jamaica	Brazil	Costa Rica
Specific needs	It is necessary to provide alternatives to the communities affected by climate change policies.	Since all the teams are new and the topics take time to understand, there is an opportunity for the course to be comprehensive and not too advanced. It is different to talk about income tax compared to carbon tax, and the topic of physical and transition risks should be clearly understood.	The ministry has a very important technical aspect, and thinking about how the issue of climate change can be incorporated into macro models. It would be very useful to have better tools to simulate impacts and design climate policies to know their impact on debt. They have shared experiences with other countries, so it is very useful to learn how others went through the process of designing instruments.	The use of “work sustainability analysis tool” is limited to the ministry and the analysis are done within it. Also, there is an absence of an official mechanism to include climate change in the discussion about socioeconomic variables. Lastly, there is a big challenge in the agriculture sector where climate represents great affections.	Sustainable public procurement. Tax incentives for environmentally friendly activities. Identify and measure the effect of climate change in imports and exports that are representative in terms of GDP.	They need some more sophisticated elements of valuation of climate action and natural disasters to include them in the medium and long term macro-fiscal scenarios. It also improves the interrelation with other ministries or public institutions, e.g.: ask the meteorological institute if next year will be more intense in rainfall or drought to take it into account in the budget and in the design of public policies.



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