

Building Back Better in Latin America: Examining the Sustainability of Covid-19 Recovery and Development Programs

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ABSTRACTS

NON-TECHNICAL SUMMARY

The significant outlays by countries in the Global South to recover from the Covid-19 crisis could have been an opportunity to build back better, advancing both a green recovery and addressing pressing social problems, thus advancing sustainability. To examine if this was the case, in this paper we analyze the expected impacts of recovery initiatives in five Latin American countries. Our results show that these programs do not support the possibility of building back better, weakly impacting twelve dimensions related to sustainability. We also propose a methodology to improve how sustainability concerns can be included in future choice of projects.

TECHNICAL SUMMARY

It has been argued that the significant outlays by governments across the world required to recover from the Covid-19 crisis can be an opportunity to build back better, i.e. advance towards greener societies. In the Global South, which suffered acute social, economic and environmental problems prior to this health crisis, recovery initiatives would be best suited to focus on sustainable economic recovery which — along with the environmental concerns of a green recovery — could address pressing local problems. To this end, we analyzed the expected impacts of recovery initiatives in five Latin American countries on each of 71 sustainability criteria. These criteria are based on the UN sustainable development goals and other relevant literature related to sustainable development. This is an Open Access article, distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives licence (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is unaltered and is properly cited. The written permission of Cambridge University Press must be obtained for commercial re-use or in order to create a derivative work.

Using principal component analysis, criteria are grouped into twelve dimensions. Our results show that recovery programs examined do not take advantage of the possibility of building back better, and many relevant dimensions related to a sustainable recovery are only weakly considered. Our methodology provides a step forward towards supporting governments in their efforts to identify better policies and investment projects and consequently put together packages of initiatives that advance on sustainability, green recovery, or other long-term goals they may have.

SOCIAL MEDIA SUMMARY

Methodology to analyze covid-19 recovery packages shows small impact on sustainability in 5 Latin American countries.

KEYWORDS

Sustainable recovery; green recovery; Latin America; COVID-19; environmental management

1. INTRODUCTION

While the covid-19 pandemic is still unfolding, many voices argue that the crisis may be an opportunity for building a better future. The World Bank (2020), the IMF (2020), international Commissions (e.g., Energy Transition Commission, 2020; ECLAC, 2020a) as well as scholars (e.g., Stern et al., 2020; Hepburn et al., 2020) have advanced ideas of guiding recovery efforts jointly toward economic goals, equity, social well-being, environmental and climate justice goals. The health crisis arrived at a time when climate change is an undeniable reality that needs urgent attention (IPCC 2018; IPCC 2021) and when social unrest is common to many countries. In this scenario, States have the opportunity to align recovery measures towards achieving more sustainable societies, by harmonizing economic, social and environmental objectives. However, previous experiences of crises have shown that countries tend to focus on short-term employment creation and other economic measures, favoring initiatives with neutral or even negative environmental and social impact in the medium and long term, and without concern for long-term structural changes and social equity (Serebrisky et al., 2020). The recovery for the previous world financial crisis presented a small window of opportunity for positive change from 2008 to 2009, but the results suggest that the crisis and its recovery had a neutral or negative impact on the sustainable transition per se in the entire world (Geels, 2013; Jaeger et al., 2020).

A predominant view in the literature is the need to advance in a “green recovery”, understood in industrialized countries as one where public spending policy “is likely to reduce GHG emissions, reduce air pollution, and/or strengthen natural capital, compared to a scenario in which the policy was not implemented” (O’Callaghan et al., 2020; Lehmann et al.2021). There are several overlapping arguments to support this approach, including that green activities have a equal or greater effects on job creation and near term economic activity, a first mover advantage could allow a country to take a stronger competitive position, and avoiding “locking in” more emission intensive and less

clean capital stock in the longer run (Strand & Toman, 2010). Activities are seen to be “win-win with respect to environmental protection and economic advance over the longer term, in addition to whatever short-term stimulus effects are provided” (ibid). Some authors disagree with this view, arguing that green policy measures would not be effective because their time frame is longer than the quick response needed for recovery (Brahmbhatt, 2020). Mukanjari & Sterner (2020) suggest however that “the immediate response is likely to be more about stabilizing the economy but gradually the focus should move over to green”.

The design of response packages can be made to include *both* short term recovery goals and long-term environmental considerations. The OECD (2020) has proposed insights on how to align short term recovery measures with long-term objectives for reducing GHG emissions, strengthening resilience to the impacts of climate change, integrating more ambitious policies to halt and reverse biodiversity loss and restore ecosystem services, including nature-based solutions, fostering innovation that builds on enduring behavioral changes, improving resilience of supply chains, and increasing adherence to circular economy principles. In another initiative, the Global Recovery Observatory has proposed eight impacts related to a green economic recovery post Covid-19 (O’Callaghan et al., 2020). Specific measures include investing in “green” or clean physical infrastructure, retrofitting existing buildings to increase efficiency, investing in education and training to overcome unemployment, and building capacities for sustainability as well as nature-based solutions and research and development for clean transformation (Hepburn et al., 2020). The World Bank (2020; Hammer & Hallegatte, 2020) has taken a somewhat wider view with their proposal of a sustainability - rather than green - checklist towards economic recovery post pandemic. This impact framework is divided into short-term investments in employment, economic activity, timeliness and risk, and long-term investments in human and social capital, technologies, natural and cultural capital, physical capital, market failures, resilience and decarbonization. Barbier & Burgess (2020) also propose that sustainability requires policy measurements that go beyond immediate employment creation. Such an approach towards sustainability aligns better with the needs of the Global South, where green recovery recommendations, though important, are insufficient for contexts with acute social, economic and environmental problems prior to the crisis.

In fact, for Latin America, advancing towards sustainable development requires considering its specific characteristics: strong inequality (ECLAC, 2020b), high levels of distrust towards institutions and unease regarding inequality, quality of democracy and key social services such as education, health and pensions (ECLAC, 2020c). In this context, to better resist future crises, it is necessary to change the current social and economic model to one that seeks to achieve the Sustainable Development Goals (SDG’S) adopted in 2015 by all the member states of the United Nations (Latinoamérica Sostenible, 2020). Therefore, a better way out of the pandemic requires promoting significant changes that generate real transformations to satisfy the just and growing demands of the population, and to achieve the necessary social and environmental balances that allow governance and even the deepening of democracies (ECLAC, 2020b). In this same line, the UNDP proposes that an important natural resource sector such as mining should make their investment decisions compatible with the 2030 Agenda on sustainable development (UNDP, 2021).

The SDGs are desirable social objectives to eradicate poverty, protect the planet and ensure the well-being of all people (UN, 2015). They constitute an international agreement to which countries have committed themselves, incorporating goals for 2030 to their national plans and follow-up processes within their own administrations. They can guide policy makers in directing development by investing strategically across sectors, shaping the industrial landscape as well as the possibilities for private actors (Mazzucato et al., 2020). In effect, these goals are an attempt to move towards multidimensional objectives of sustainable development. Therefore, SDGs can be an initial source from which to choose the criteria for selecting actions for sustainable post-covid recovery.

Consequently, the path to sustainability requires that social, economic, and environmental needs be considered together, in particular, in recovery programs that imply significant outlays. These dimensions must be perceived by the stakeholders and the needs derived from them, identified, quantified, and adequately balanced (Poveda, 2016). In practice however, studies have shown that this balance does not occur, and that only some dimensions of sustainable development are fulfilled or even touched upon in the public sector's decision-making process (Cutter et al., 2017). Also, as discussed above, in previous crisis the opportunity to incorporate these issues has been missed. How to assess specific public programs and projects is key to countries' capacities to select sustainable recovery initiative portfolios, and there is a gap in evaluation tools for that purpose (Mercure, 2021; Kattel et al., 2018). There is also concern that some initiatives tucked into these recovery packages actually play against sustainable recovery. To address these concerns, our research question is: how to characterize specific initiatives as well as recovery programs, consisting of packages of initiatives, in terms of their contribution to a sustainable recovery?

Current methodologies to examine how specific measures support a better recovery generally propose archetype policies and identify their impacts on several relevant dimensions. For example, the Global Recovery Observatory (GRO) (O'Callaghan et al., 2020) evaluates 3,000 policies of the fifty largest economies in the world based on eight indicators of environmental, social and economic impacts, which are organized within 40 archetypes. The Climate Action Tracker (2020) also assesses the level of "greenness" and the potential impact on emissions by 2030 of the rescue and recovery measures of the five largest emitting countries, based on policy archetypes proposed by the Greenness of Stimulus Index (GSI, an environmental impact assessment of measures in polluting sectors) (Vivid economics, 2020). It includes data for recovery measures from the Energy Policy Tracker (evaluation of energy measures) (IISD, 2021), CarbonBrief Tracker¹ (monitoring of "ecological" measures), Policy Response to COVID-19 Tracker² (summary of measures) and the Greenness of Stimulus Index. As can be seen, these instruments mainly focus on priorities for a green recovery.

In this paper we propose and apply a methodology to assess the sustainability of recovery packages in Latin America that can be useful to improve the choice of investment projects by public decision-

¹ <https://www.carbonbrief.org/coronavirus-tracking-how-the-worlds-green-recovery-plans-aim-to-cut-emissions>

² <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>

makers. The methodology is different from the ones discussed above on two counts. First, we propose a straightforward methodology to characterize the sustainability of individual initiatives based directly on their impacts on different criteria relating to sustainable development, without considering their relation to archetype policies. These criteria can be multiple and are determined based on the sustainable development goals and other complementary literature. We thus broaden the scope of the characterization of impacts moving from “green” to “sustainable”. Second, based on the initiatives proposed in the recovery packages of five Latin American countries, we use principal component analysis to group these criteria with a fewer number of distinct dimensions or factors. Based on these dimensions, we examine the program portfolios of these five Latin American countries for their alignment with a sustainable recovery approach.

The rest of the paper is organized as follows. Section 2 presents the methodology used in this paper to qualify the initiatives proposed by five Latin American countries and to identify the key dimensions of analysis. Section 3 presents the main results obtained from analyzing the five recovery programs, Section 4 discusses the results and Section 5 presents the main conclusions and recommendations.

2. METHODOLOGY

To examine the contribution of a portfolio of projects to sustainable economic recovery, a methodology is required that considers the impacts of each portfolio’s initiatives on various objectives. To accomplish this, a factor analysis methodology was used that takes numerous criteria associated with sustainable recovery and reduces them to a manageable number of dimensions or factors. Based on the final criteria and dimensions from factor analysis, the portfolios for each country were examined.

The stages followed for the factor analysis were the following:

- **Stage 1:** Definition of criteria to evaluate a sustainable recovery
- **Stage 2:** Information Construction: selection of initiatives, policy measures and investment projects
- **Stage 3:** Assessment of initiatives
- **Stage 4:** Grouping of information and identification of relevant final dimensions.

The **first stage** required the identification of observable phenomena related to a sustainable reactivation, a latent concept, i.e., not directly observable. For this, a bibliographic review of international public policy documents focused on a green and sustainable economic recovery was carried out. From these documents, a set of simpler phenomena was identified, which we called criteria (items), which would be an observable consequence to some degree of the latent concept (Canales Cerón, 2006).

To do this, we began with the World Bank proposals included in the document “Proposed Sustainability Checklist for Assessing Economic Recovery Interventions” (World Bank, 2020)

complemented by other studies that focus on a green recovery, prioritizing low-carbon economic development: Global Recovery Observatory (O'Callaghan et al., 2020), Oxford (Hepburn et al., 2020), IEA (2020), IMF (2020) and the World Bank (2020). From this information, 33 criteria were initially identified for a green economic recovery.

As discussed in the previous section, it is necessary to make a distinction between a *green recovery* and a *sustainable* one, the latter being more relevant for Latin America. For this reason, the vision of a green recovery obtained from developed-country literature was complemented with the priorities for Latin America and developing countries. This allowed progress towards a set of criteria to characterize sustainable recovery, which puts equity, people's well-being and environmental justice as priorities. For the above, the 33 initial criteria were added to those from other sources related to sustainable development. We began by using the UN Sustainable Development Goals (SDG) (2015) and complemented them with other literature: ECLAC (2020a); European Climate Foundation (2020); Latinoamérica Sostenible (2020); Loayza et al. (2020). The specific methodology of criteria selection is detailed in the Appendix A.

In the **second stage**, the initiatives that various Latin American countries have taken to face the pandemic were selected. A review of the publicly available information on government and public ministry web pages was made from March to December 2020 (see Appendix B). Based on the quality of the information available, the specific countries and initiatives to be considered in the process were identified.

The **third stage** dealt with an ex-ante evaluation of the selected projects and initiatives. This evaluation consisted of crossing each project and initiative with each of the criterion selected in the first stage. Each criterion was rated by answering "POS" if the measure met the criterion, "NEG" if it negatively affected the criterion, "NEUT" if it had no effect on the criterion, was unrelated in thematic terms, or did not explicitly address the issue, and "MIS" if there was not enough information to evaluate. To ensure consistency in the application of the criteria, rigorous guidelines were developed on the meaning of each of the four possible qualifications for each criterion, which are detailed in Table A2 of the Appendix A. This assessment was undertaken by the research team.

In the **fourth stage**, the criteria were grouped into consistent factors or dimensions. For this, an approach based on Exploratory Factor Analysis (EFA) was applied. This consisted of identifying those variables with common variances that gave rise to a construct or factor. Each variable contributed to explain part of this factor through a weighting or score. Using this weighting, explanatory variables of a certain phenomenon were combined and reduced to one latent variable (a construct) based on their common variance.

To validate the reliability or internal consistency of items or criteria that are part of a factor, the Cronbach's Alpha coefficient was used, which measures the degree of correlation between the items. This is the most commonly used statistic to measure reliability in studies in the social sciences and in the health area (Cronbach, 1951; Hogan et al., 2000). Factor analysis using SPSS v25 was applied to valid cases, replacing the data that did not have information with the mean value of the

criterion. To assess whether the factorial model as a whole was significant, the Kaiser, Meyer and Olkin contrast tests were used. The Bartlett test of sphericity was applied to establish whether the factorial analysis is applicable.

The extraction analysis was done using the principal component analysis selecting the eigenvalues greater than one. The rotated factorial solution was chosen since it generates a greater load on the components. The *Quartimax* method was used for this, which is convenient when there are a large number of components because it can minimize the number of factors necessary to explain each variable (Jackson, 2005).

After obtaining the factors, the conceptual content of the criteria belonging to the same factor was examined to better understand the underlying aspects that explained the correlations between them. This was contrasted with the theoretical review to identify if there were conceptual relationships between these criteria. The goal was to obtain results that would maintain as much information as possible from the original variables but with as few factors as possible. The final sustainability analysis of the recovery packages by country was then carried out using these factors.

3. ANALYSIS OF RECOVERY PROGRAMS IN FIVE LATIN AMERICAN COUNTRIES

In this section, we present the main results of the paper. We first present the recovery packages of five Latin American countries and analyze them based on the sustainable development criteria identified from the literature. We then identify the dimensions or factors in which the different criteria are grouped based on a principal component analysis and examine how the different recovery packages are aligned with these dimensions.

3.1. THE RECOVERY PROGRAMS

To identify the Recovery Programs to be considered, a review of the information made publicly available on government web pages between March and December 2020 was carried out. From this review, Chile, Peru, Brazil, Panama and Colombia were selected based on the transparency and clarity of their relevant project packages with a specific additional budget for the health contingency. This made it possible to increase the objectivity of the next step, since, with the sufficient quantity and quality of information declared by these five countries, it was possible to apply the proposed criteria in a reliable way, with a minimum of inconsistencies and doubts, and a limited number of responses with missing information (or “MIS”).

In total, the five countries declared 170 initiatives in sufficient detail to be evaluated with the proposed methodology. The total amount of investment considered was significant, USD \$ 240 billion, corresponding to 8.8% of the GDP of the five countries on average. They include measures aimed at short-term rescue for families and companies, improvements in health systems, and — with a more lasting medium and long-term impact on economic recovery — increased expenditure on public infrastructure to generate employment.

Table 1 presents a summary of the information considered for the evaluation, after selecting five countries and 170 initiatives based on the methodology described in the previous section. Appendix B contains the details of the initiatives considered for each country with their respective sources.

Table 1: Summary of project packages considered in the evaluation.

Country	Total investment or expense amount (MM USD)	Percentage of each country's GDP (WB, 2019)	Number of measures/initiatives/projects	Description of the packages
Chile	\$34,160	12.1	79	Financial aid to the most affected individuals, families, workers and companies and investment in public infrastructure
Peru	\$22,920	10.1	22	Focus on rescuing the economy, delivering liquidity to the banking system and providing assistance to families
Brazil	\$157,050	8.54	45	Liquidity for local governments, health and employment subsidies
Panama	\$5,950	8.91	8	Focus on large projects: metro and water infrastructure initiatives
Colombia	\$20,385	6.3	16	Mixed focus on infrastructure projects and economic rescue through loans and rate subsidies
Total	\$240.465,58	-	170	-

Source: own elaboration based in Appendix B.

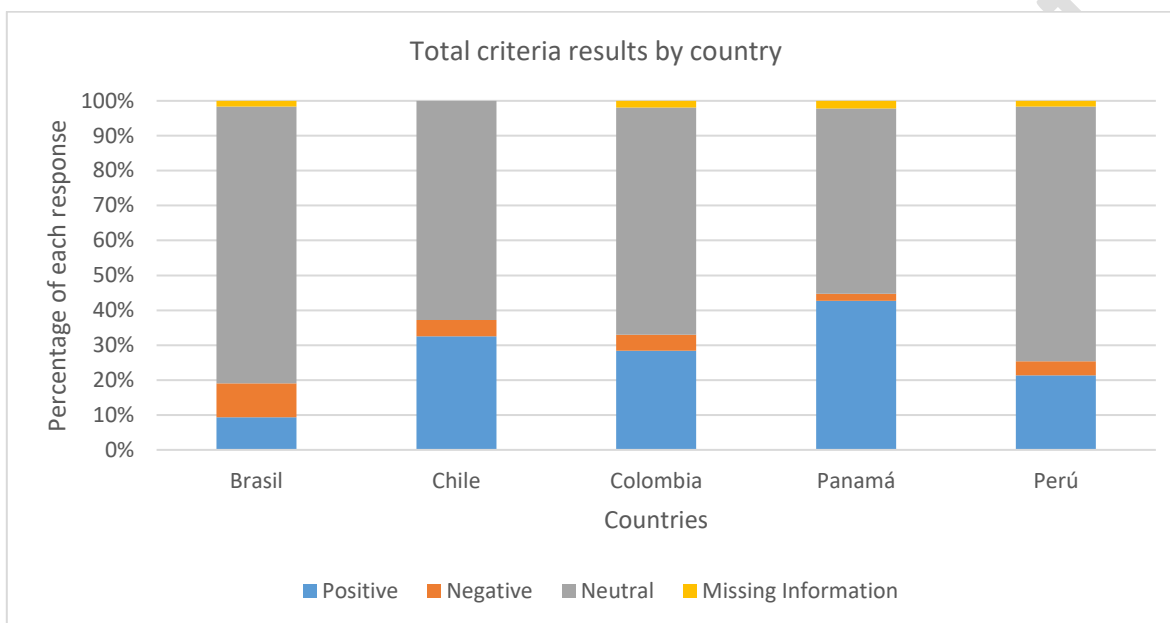
3.2. DESCRIPTIVE ANALYSIS OF THE INDIVIDUAL INITIATIVES

As described, in Stage 1 of the methodology, 71 criteria were identified to qualify the contribution of each initiative to a sustainable recovery (see Table A1 of Appendix A). These were applied to the 170 initiatives discussed in the previous section, for a total of 12,070 ratings. Because the initiatives consider very different monetary outlays, we first analyzed ratings by considering only the number of specific initiatives and after this, the weighted value by size of each initiative, measured in terms of cost or investment. Results were similar and since weighted values are more appropriate for comparison purposes, only weighted values are presented in what follows.

Figure 1 shows the percentage by country of Positive, Negative, Neutral and Missing Information ratings. For example, in the case of Chile, 79 initiatives weighted by their respective monetary outlays were rated for each of the 71 criteria, giving a total of 5,906 ratings. Of these, 1,802 were

positive, which provides a 33% weighted score for the amount of investment as can be seen in the figure. The average positive rating of initiatives across countries is 27%. The average neutral rating is 67% while the average negative rating is 5%. The results show dispersion among the countries, with Panama having the highest percentage of positive ratings with 43% weighted average and Brazil with the lowest percentage of positive ratings with 9%.

Figure 1: Rating of Sustainability Criteria for 170 projects in five Latin American countries (weighted for amount of investment in each project).



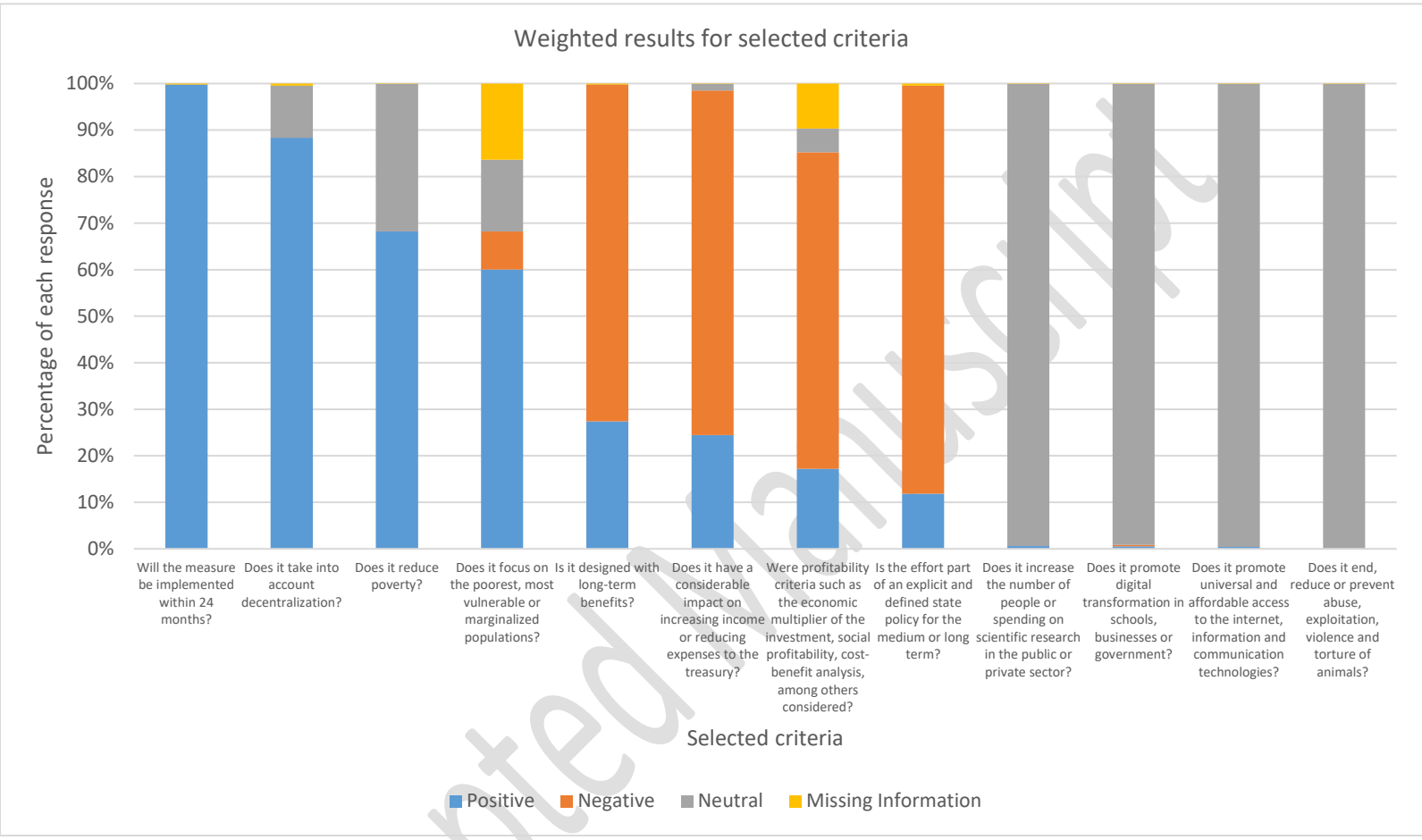
Source: own elaboration.

To better understand which criteria have mostly positive, negative, or neutral ratings, Figure 2 presents the 4 criteria with the highest value of each of these ratings. Two of the 71 criteria stand out with a high number of positive ratings: implementation of the project in the short term (less than 24 months) (99%) and decentralization (98%). This is reasonable considering the need to rapidly ensure short-term economic activity in the face of the impacts of the pandemic and an impact in all parts of the country. On the other hand, there are a few criteria that are negatively impacted by the proposed initiatives. Specifically, many of them are not part of a long-term state policy (69%) and/or do not include long-term benefits (32%), highlighting the short-term perspective of the selected projects.

Finally, 15 criteria are neutral for 97% or more of the initiatives, i.e. the initiatives generally do not impact these criteria positively or negatively. These include, among others: reduction of animal abuse, contribution to scientific research, internet access and digital transformation, criteria related to the resilience of natural systems, ecosystem restoration, access to drinking water, access to green areas, energy security, and promotion of gender equality. Many are related again to the lack of a

more long-term perspective, but it is noteworthy that various environmental impacts are also neutral in the proposed projects.

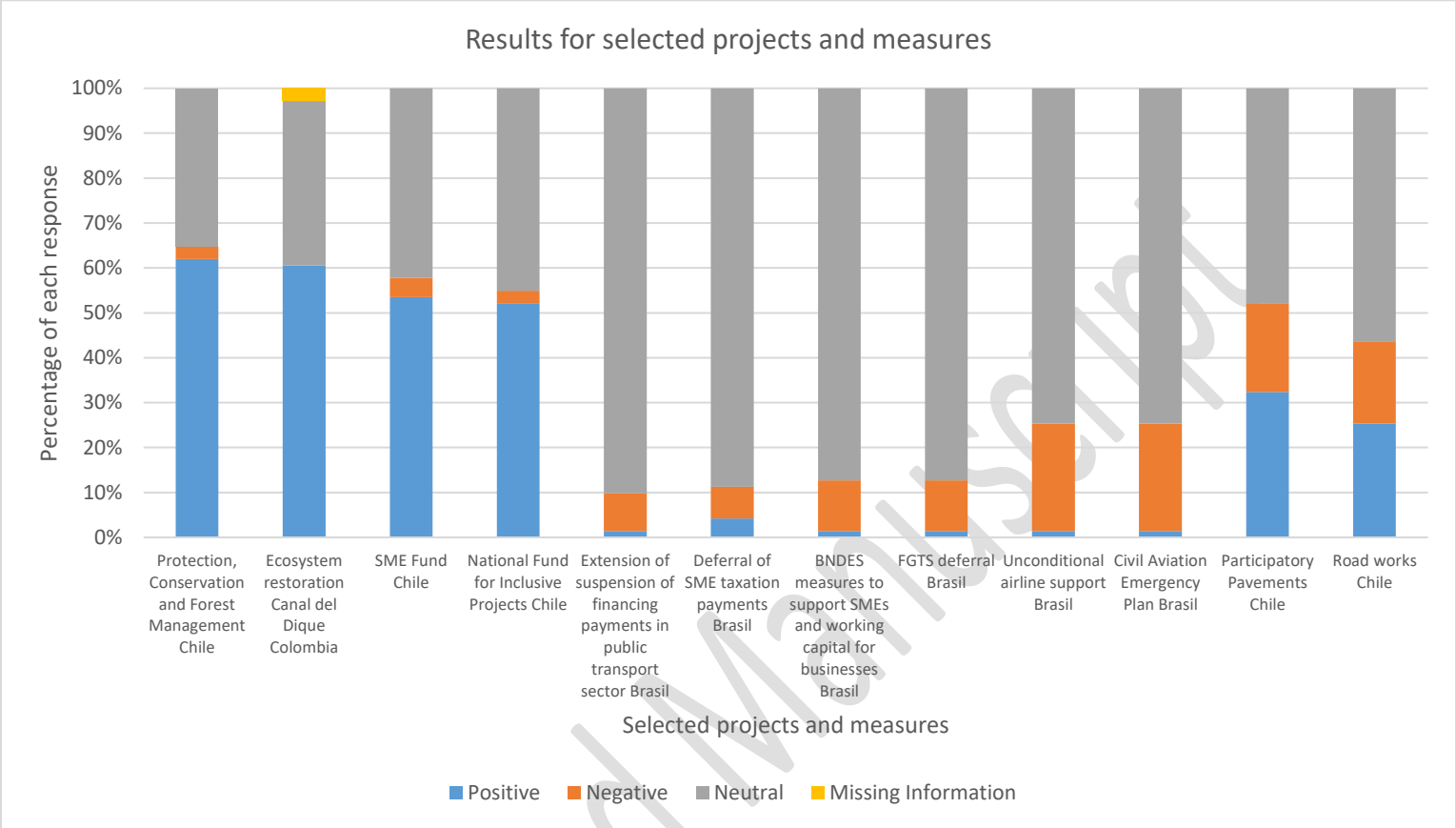
Figure 2: Weighted results for 12 selected criteria: 4 from the highest positive results, 4 from the highest negative, and 4 from the highest neutral results.



Source: own elaboration.

Finally, the ratings can be used to examine the initiatives themselves in terms of their expected impact on sustainability. Figure 3 presents results for selected projects. In terms of high positive impact ratings, the following projects and initiatives stand out: the restoration of ecosystems in Chile (62%) and Colombia (60%); support for SMEs in Chile (53.5%) and Peru (51%); energy transition projects in Colombia (49%); green credits in Chile (51%); local development projects in Chile (52%); water resource programs in Panama (51%). There were 29 projects with over 80% neutral responses, including financial support projects, reduced tax payment projects and postponing debt initiatives, among others. The projects with the highest number of negatively evaluated criteria included unconditional support for airlines in Brazil (24%) and the construction of road infrastructure in Chile (20%).

Figure 3: Results for 12 selected projects and measures, 4 from the highest positive criteria, 4 from the highest neutral criteria and 4 from the highest negative criteria.



Source: own elaboration.

3.3. MAIN DIMENSIONS OF SUSTAINABLE RECOVERY PROGRAMS

To facilitate the analysis of the contribution of each country's initiatives and project packages to a sustainable recovery, we defined dimensions of analysis that can group related criteria. To accomplish this, we used the initiatives proposed by the five Latin American countries to define consistent dimensions based on a principal component analysis. Factor analysis using SPSS v25 was applied to the 169 valid cases since one was eliminated due to lack of information. There are 191 cells that are equivalent to 1.6% of the data that have no information and are replaced by their average value.

To assess whether the factorial model as a whole is significant, the Kaiser, Meyer and Olkin contrast tests were used, which showed a level of 0.7 considered satisfactory. The statistical information used consists of 169 valid cases and 71 variables, with a Cronbach's Alpha of 0.897, considered good (Frías-Navarro, 2021). This implies criteria were grouped consistently.

A first result from the data, considering only those criteria that have a factorial load greater than 0.5, is that 69 of 71 criteria can be included in 12 Factors that each explain 2% or more of the observed variance^{III}. The 12 factors presented in Table 2 explain 66% of total variance. Each factor is a latent variable that includes criteria that are highly correlated. To better characterize these factors, we have labeled each one according to the issues it encompasses.

Table 2: *Selected factors/dimensions of analysis.*

Factor/ Dimension Number	Factor/Dimension Name	Total variance explained	
		% of variance explained	% accumulated
1	Support for decarbonization and reduction of environmental impact	16.1	16.1
2	Promotion of employment and economic activity	11.9	28.0
3	Protection of ecosystems and natural resources	7.2	35.2
4	Promotion of development and human well-being through inclusive institutions	6.7	41.9
5	Inclusive infrastructure development	5.1	47.0
6	Emphasis on solidarity and inclusion	4.1	51.1
7	Promotion of local development	3.1	54.3
8	Poverty reduction	2.8	57.1

^{III} The criteria “Does the criteria end, reduce, or prevent abuse, exploitation, violence or torture of animals?” is not considered in any project. The criteria “Will the measure be implemented within 24 months?” is positive for almost all projects. As a result, these criteria do not contribute to the total variance and were not included.

9	Support for the development of technological capabilities	2.3	59.4
10	Development of diversified, sustainable and transparent value chains	2.2	61.7
11	Promotion of universal access to basic services	2.2	63.9
12	Respect for local, traditional or indigenous communities	2.1	66.0

Source: own elaboration based on analysis using SPSS.

The factor with the highest factor load (16%) groups the variables related to initiatives that support decarbonization as well as those that reduce environmental impact. This high factor load implies that these criteria are correlated with each other and have a high variance. The fact that decarbonization and environmental impact appear together means that when projects that support decarbonization are carried out, they also reduce environmental impact.

As an example of the issues included in each factor, Table 3 shows the 12 criteria that are grouped in the first factor: Support for decarbonization and reduction of environmental impact. The first 6, which have the highest factor load, correspond to measures related to decarbonization, while the next 6 are related to the reduction of different types of environmental impacts, including waste, emissions, industrial settlements, irreversible damage, among others. Cronbach's Alpha for this first group of variables was very close to one, which indicates that the variables adequately describe this construct.

Table 3: Criteria included in Factor 1: “Support for decarbonization and reduction of environmental impact”.

Factor	Criteria	Load factor	Average
1. Support for decarbonization and reduction of environmental impact	Does it consider cost efficient measures to reduce GHG emissions?	0.888	0.077
	Does the intervention remove or reduce financial market, tax, or regulatory obstacles to decarbonization (e.g., for energy efficiency or low-carbon technology deployment)?	0.877	0.041
	Does the intervention create or amplify a lock-in of carbon - or energy- intensive development patterns, or represent a future stranded asset risk due to decarbonization, technology change or other market trends?	0.826	0.018
	Is the intervention consistent with and supportive of existing long-term decarbonization targets and strategies?	0.814	0.030
	Is the incorporation, importation, development or piloting of new low-carbon and more efficient technologies or strategies promoted, either for mitigation, capture and / or adaptation with significant growth potential?	0.778	0.077
	Is there explicit concern about the climate impact of the measure?	0.762	-0.060
	Does it avoid the risk to the health of the population, due to the quantity and quality of effluents, emissions or residues?	0.754	0.112
	Does it prevent pollution or environmental impact of human settlements and industrialization?	0.748	-0.018
	Does it manage waste rationally and ecologically?	0.700	-0.036
Does it improve labor productivity through measures with socio-environmental co-benefits?	0.651	0.136	

	Could the intervention generate irreversible environmental losses?	0.651	0.041
	Does it support a sustainable and efficient management of renewable natural resources (water, soil and air) and ecosystem services?	0.600	0.077

Source: Table C1 in the Appendix C.

For the other 11 factors, consistent groupings of criteria associated with a relatively specific theme are identified. In Table C1 of the Appendix C, we present similar tables for the other factors.

The resulting groupings make it possible to simplify the analysis of the expected impacts on each country's post-covid recovery program package, based on the identification of twelve factors (we will call them dimensions from here on) of impact. In broad lines and as expected, the programs include initiatives that promote short-term employment and economic activity (Dimension 2) as well as initiatives that focus on poverty reduction (Dimension 8), considered as traditional public policy responses in post-crisis recovery. Other dimensions include initiatives that focus on decarbonization and environmental care (Dimension 1) and on the protection of natural systems and resources (Dimension 3.) These dimensions are similar to the proposals for a “green recovery” and tend to reconcile climate decarbonization objectives with local environmental objectives.

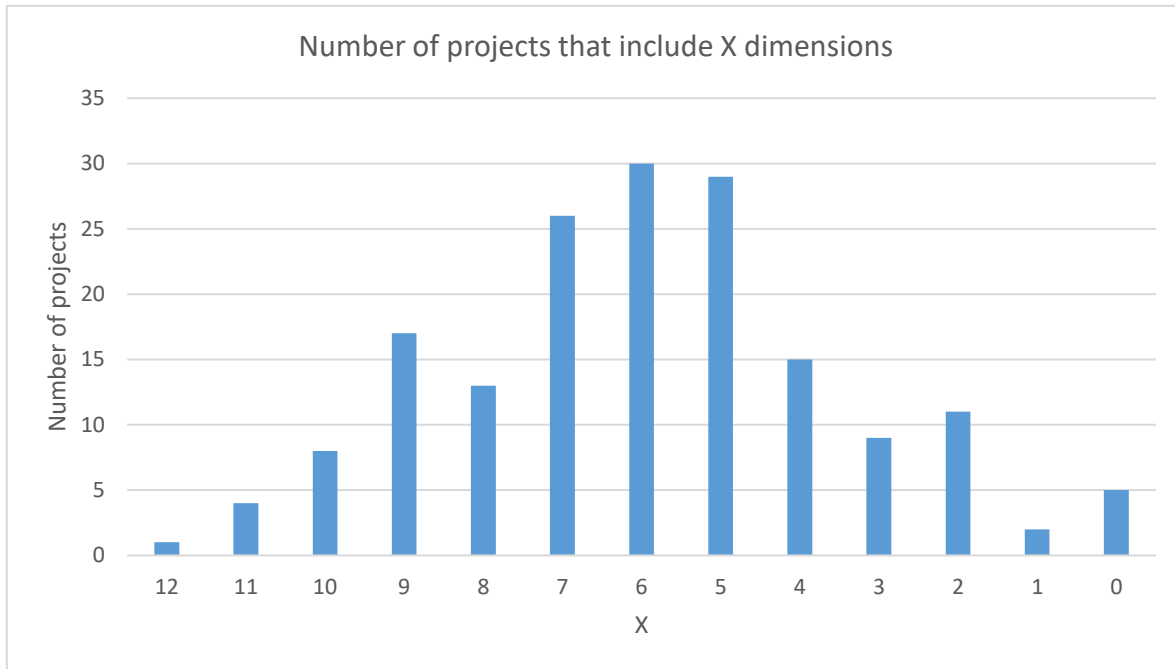
At the same time, a number of initiatives show impacts that cover broader dimensions than those expected to affect the economy in the short term and/or the green recovery. The dimensions of inclusion, both in the development of institutions (Dimension 4) and infrastructure (Dimension 5), as well as solidarity (Dimension 6) are evident — dimensions aligned with proposals in the literature that emphasize the need to improve the socioeconomic inequity that characterizes the Region. There are also initiatives that promote access to basic services (Dimension 11) and that promote local development (Dimension 7). Initiatives that foster the development of technological capabilities (Dimension 9) and the development of production chains (Dimension 10) and, finally, initiatives related to traditional and indigenous knowledge can all be found within the recovery programs (Dimension 12).

3.4. ANALYSIS OF RECOVERY PROGRAMS IN LATIN AMERICA BY DIMENSION

The 12 dimensions of analysis identified in the previous chapter can be used to characterize the impact on sustainable development of the individual initiatives as well as the packages of initiatives proposed by each country. Figure 4 presents the number of dimensions that are positively impacted by each individual initiative. Of the 170 initiatives examined, most impact more than one dimension, and actually, half of them impact between 5 to 7 of the 12 dimensions. Only two projects (“Investment in Manaus Free Trade Zone” and “Extension of suspension of financing payments in

public transport sector” of Brazil) focus on only one impact while one project (Chile’s “Green Credit”) positively impacts all 12. Finally, 5 projects do not impact any dimension in a positive way, only neutral or negative. Appendix D presents the full list of projects and their impacts on each sustainability dimension.

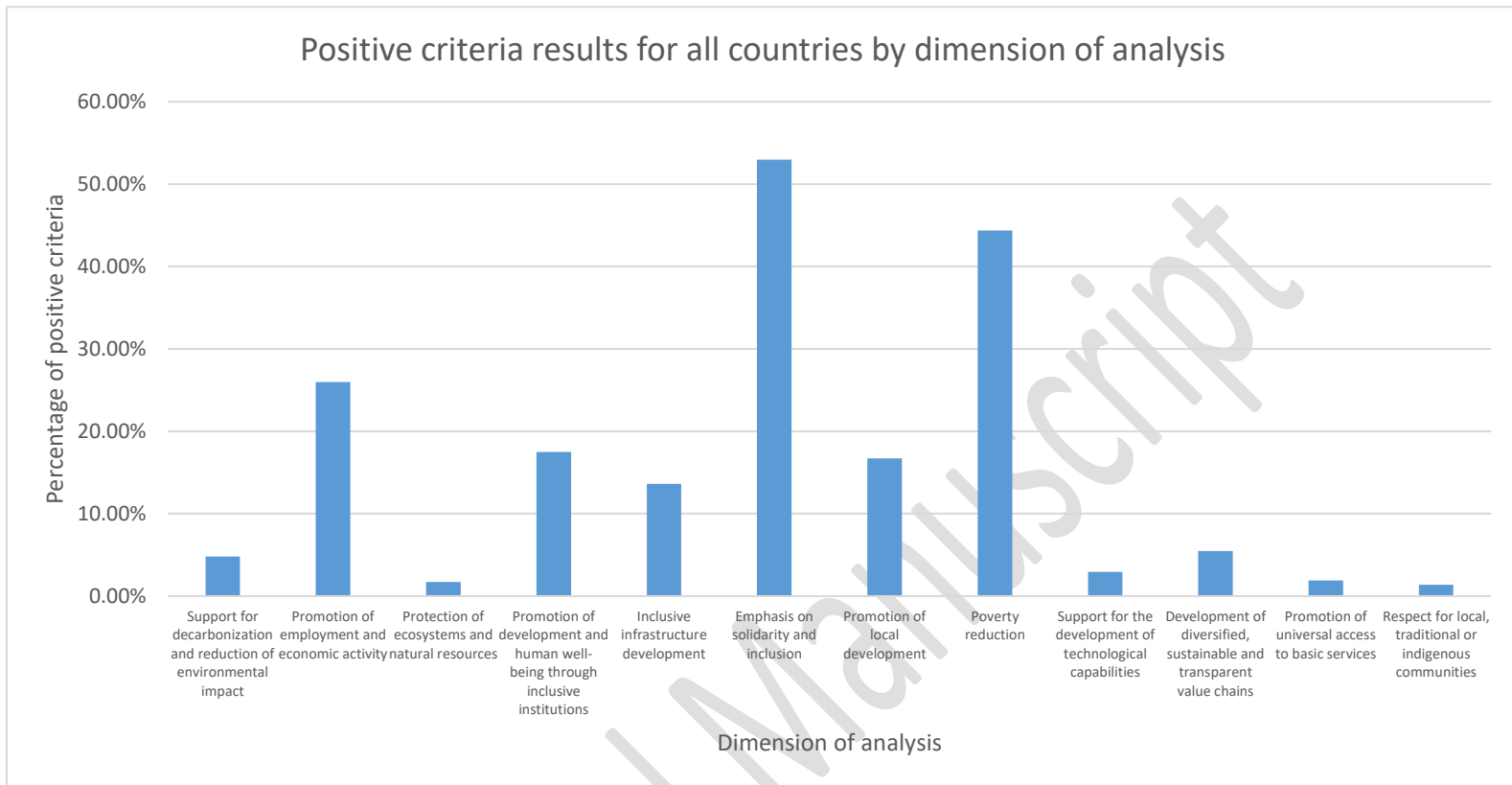
Figure 4: Number of projects by dimension of analysis for selected countries. *ss*



Source: own elaboration.

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Figure 5: Weighted results for positive criteria by dimension of analysis in total for the selected countries.



Source: own elaboration.

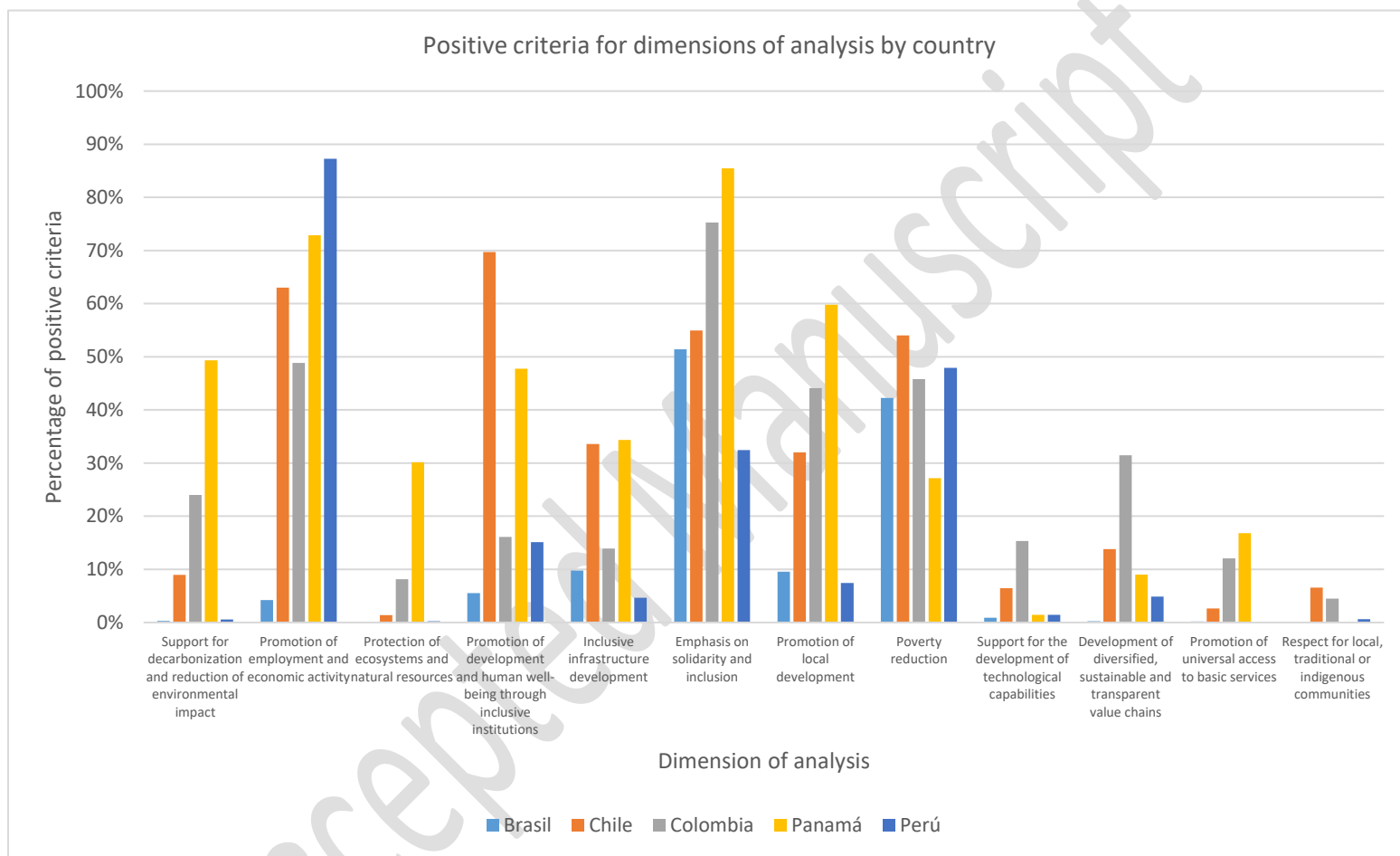
Figure 5 shows the percentages of positive impacts by dimension when considering the 170 initiatives, it also shows that there are substantial differences in the importance of the dimensions linked to a sustainable recovery. As discussed above, the average value of positive responses among all the cases is 16%, but there are dimensions that have much higher positive responses, such as the Solidarity and Inclusion dimension with 53% of positive values, Poverty Reduction (44%), and Employment and Economic Activity with 26%. This means that many of the Recovery initiatives consider these social dimensions positively.

However, six of the twelve dimensions are weakly considered by the initiatives in the sample, with 5% or less of positive impacts. They include environmental dimensions but also Access to Basic Services, respect for local traditional or indigenous communities, and more long-term impacts such as the development of technological capabilities.

Figure 6 presents a similar analysis but by country, which shows important differences among the 5 countries analyzed. Countries differ in terms of the importance given to each dimension in their package of initiatives. Considering an admittedly subjective benchmark value of 10% positive ratings, Chile is below this benchmark in only one dimension, Colombia and Panama in 3 dimensions,

Peru in 4 and Brazil in 7 dimensions. Panama and Chile stand out with the highest positive results in most of the dimensions studied. Panama's recovery package emphasizes the dimensions of Employment and Economic Activity, Solidarity and Inclusion, and Local Development. In Chile, the dimensions of Development and Human Well-being, Solidarity and Inclusion, and Employment and Economic Activity are emphasized. On the other hand, Brazil is the country with the least number of positive ratings.

Figure 6: Weighted results of positive criteria by analysis dimensions for each country.



Source: own elaboration.

As expected, the results relating to the positive impacts on criteria indicated above at the overall level are replicated at the country level. Indeed, the dimensions that are least present include those that protect natural resources and those that support decarbonization and reduction of environmental impacts. However, this is not homogeneous among the different countries in the sample. For example, in the case of initiatives that support decarbonization and the reduction of environmental impacts, Peru has 0.6% positive responses and Panama 49%; for employment and economic activity, Brazil has 4% positive responses while the other four countries have 49% or higher.

4. DISCUSSION

Most individual initiatives have largely neutral impacts on the proposed sustainability criteria. This can be expected since countries are dealing with a pandemic that requires taking charge of immediate social concerns. Policy makers must rapidly identify a set of initiatives that can be implemented quickly with current institutionality. Consequently, the first set of initiatives are financial, can be readily designed and applied, and have direct impacts on wellbeing, i.e. helping households to pay bills and firms to generate employment in the short term. Another set of initiatives are to advance infrastructure projects that are already in the pipeline. In particular, many public investments have been accelerated. These projects have been previously identified and prioritized based on the specific public policy goals of each country, following their established procedures to assess projects that do not incorporate sustainability concerns. Therefore, many initiatives are not especially geared to advancing SDGs as proposed by the UN 2030 Agenda.

A second consequence of this is that initiatives that have negative impacts on some criteria are implemented, such as unconditional support for airlines in Brazil, or road paving in Chile that both negatively affect decarbonization. The fact that quick results are needed, makes it difficult to choose only those that have positive or at least neutral impacts on sustainability. Requiring modifications to initiatives to reduce or avoid this, requires an ex-ante procedure that would allow incorporating sustainability criteria in the assessment process, either as a normal practice or when deciding special emergency investments as in this case.

A third repercussion is that most of the proposed initiatives have a short-term focus and do not incorporate new issues such as digital transformation or gender equality. In developing contexts, the pressing needs of the population, such as employment and poverty, take precedence over these new, and/or long-term considerations, such as those related to the environment. This is embedded in the usual assessment process of investments as well as the institutions required to implement initiatives. Emergency projects to confront the consequences of the pandemic are chosen based on these same criteria and cannot be expected to incorporate more long-term sustainability concerns without a more explicit approach for this.

As a result of this short term and more traditional approach to selecting individual recovery initiatives, the packages of initiatives for each country with few exceptions have relatively weak impacts on relevant long-term sustainability dimensions including environmental concerns, development of technological capabilities and better access to basic services. The emphasis is on the promotion of improvements in more traditional objectives such as employment, economic activity and poverty reduction. In part, this is due to the fact that current policy assessment methods in ministries and agencies, such as cost benefit analysis, are generally not adequate to evaluate and thus trigger the more pervasive and transformative changes required in the long run (Mercure, 2021). Kattel et al. (2018) argue that both the theoretical and practical approaches to policy evaluation should be enriched and diversified to create the capacities needed to deliver challenge-driven policies, as required to advance to low carbon and more sustainable economies.

Finally, to systematically advance sustainability, the decision-making process for selecting initiatives should incorporate a procedure to weed out projects with significant negative impacts. Alternatively, these initiatives could be identified and manage strategies to mitigate these negative impacts required for project approval. Also, initiatives with positive impacts on desirable criteria and dimensions could be given more importance than following traditional approaches to project assessment and prioritization, such as cost-benefit, thus reducing neutral ratings. In this way, when building recovery packages, even though individual initiatives don't impact many criteria or dimensions, each package with various initiatives would be comprehensive, i.e., affect most if not all dimensions. This would allow a more nuanced approach, effectively using scarce resources to build back better, advancing sustainability according to each country's priorities.

Characterizing initiatives by criteria based on SDGs as has been done in this study would allow a relatively straightforward ex-ante sustainability assessment of each project and package of initiatives. For example, the institutions that propose the initiatives could be required to fill out a form that would apply a checklist of criteria developed by those characterizing their sustainability impacts. It would also help improve initiatives, such that for example short-term financial incentives could be required to include long-term impacts on gender equality, recycling materials or restoring ecosystems. Each country could also target those dimensions considered priorities when choosing projects. It can be expected that countries in the Global South could prioritize poverty reduction or universal access to basic services, with decarbonization and protection of ecosystems as second priority to achieve social and environmental transformations in the region in the long term. This approach to rating existing investment projects or financial initiatives is more appropriate for developing countries that most probably cannot set up specific funding such as the European Union's Next Generation EU^{IV}.

5. CONCLUSIONS AND RECOMMENDATIONS

In Latin America, many countries are undertaking significant outlays to reduce the negative impacts of the Covid pandemic. It has been proposed that this could be an opportunity to build back better prioritizing projects that contribute to a green or sustainable recovery. However, the results from the analysis of the five Latin American countries selected to be reviewed suggest that this has not been the case. Some initiatives have negative impacts on criteria related to sustainability and the packages of projects for each country generally do not consider many key dimensions for sustainable development. The dimensions related to environmental concerns are especially weak. This will not help advancing towards a more balanced development process.

Our results were obtained using a methodology to ascertain the expected impacts of recovery projects on variables related to sustainable development. A distinction was made between a green recovery and a sustainable one based on the SDGs, in which the latter focuses on issues relevant for countries in developing contexts, such as the five countries examined in this paper. With this focus,

^{IV} See https://europa.eu/next-generation-eu/index_en

69 criteria were grouped in 12 dimensions based on Principle Component Analysis that were then used to characterize the contributions of each country's package to a sustainable recovery.

The analysis revealed two environmental dimensions in these recovery programs that can be related to a "greener" recovery: Protection of Natural Systems and Resources, and Support for Decarbonization and Reduction of Environmental Impacts. Seven of the dimensions have to do with other factors linked to sustainable development, both in the short and long run. These include impacts on employment and economic activity, poverty reduction, development of diversified and sustainable value chains, support for the development of technological capabilities, promotion of universal access to basic services, local development, and respect for local traditional communities. The other three dimensions relate to more inclusive infrastructure and institutions, promotion of solidarity and inclusion.

The 5 packages of projects examined have a high positive number of impacts on only a few of these sustainable recovery dimensions: first, in the social dimensions of Solidarity and Inclusion (53%), Poverty Reduction (44%) and in the Promotion of Employment and Economic Activity (26%). However, the recovery packages weakly considered — with less than 2% positive responses — three dimensions: the protection of Natural Systems and Resources, promotion of Access to Basic Services and Respect for local, traditional or indigenous communities. The other seven dimensions, many of which relate to the long term, and including support for decarbonization and reduction of environmental impacts were included relatively weakly, with between 3% and 18% positive responses. These results are particularly worrisome if the goal is sustainable development, since they show that the emphasis of the recovery packages is more on economic and short-term measures, and less on the long-term impacts and related structural changes required for sustainable development. The two green recovery dimensions are weakly considered in these recovery packages. This has also been observed in studies relating to previous crisis. Countries "return to basics", relegating environmental and climate change concerns to the background of political, economic and public interests, due to the disproportionate central role of short-term employment measures (Geels, 2013). This prevents the proposal and implementation of green measures and increases the lock-in of the emission-intensive and less clean capital stock (Strand & Toman, 2010). During the 2008 crisis, despite the presence of green stimulus measures, greenhouse gas emissions decreased in the short term due to a fall in economic activity, but rebounded strongly after the recovery (Jaeger et al., 2020).

None of the countries has a clearly better performance in terms of positive answers in all dimensions, however Panama stands out as being first in 7 dimensions with Chile just behind. Brazil's recovery package, on the other hand, shows the lowest positive ratings on 7 of the 12 dimensions. The weak results in terms of sustainability of the recovery packages are because most of the initiatives are neutral. i.e., have no impact on the criteria or are unrelated in thematic terms (67% in average). It is also worrisome to observe that projects do not address the promotion of scientific research, digital transformation or access to internet, all related to long-term impacts. Additional concerns arise from the fact that some projects play against sustainability, being qualified

with a negative impact on criteria, i.e., support for airlines in Brazil (24%) and the construction of road infrastructure in Chile (20%).

It can be concluded that the countries examined have not taken full advantage of the possibility of building back better, in the sense that the recovery packages do not promote a nuanced approach to a green or sustainable recovery. Of course, there can be many reasons for this relating to the availability of resources, political economy considerations and technical and institutional capacities, among others. This, together with the causes of the heterogeneity in terms of positive impacts of recovery packages among countries, needs to be examined in more detail in future studies.

Methodological recommendations to assess public investment projects in the Global South.

In any case, if sustainable development is the goal, it would be useful to improve the methodology for characterizing and selecting projects for recovery packages. Furthermore, looking ahead, the Covid crisis will pass, but climate change and inequality will continue to present huge challenges. Developing countries must move towards a more sustainable development path with a clearer focus on ensuring that the scarce resources available are adequately allocated. Economic assessments and cost benefit analysis of investment projects, though necessary, are not sufficient.

The methodology developed here provides a way forward in a two-stage process of (1) identification and validation of impacts of initiatives and (2) selection of the recovery package. In the first stage each potential initiative considered for a recovery package could be required to include a form with a qualification by its proponents of the expected impacts, using the criteria proposed in this document, or similar. The ratings for each initiative should then be reviewed and validated by an expert panel set up by the Committee in charge of defining the recovery package. This is a manageable process as shown by the characterization undertaken for the 170 initiatives in this paper. When possible, improvements could be requested, for example that any negative impact be compensated or eliminated.

As a result, in this first stage, initiatives would be characterized according to their impacts on each criterion and impact dimension. In the second stage, the potential recovery packages with different mixes of initiatives would be identified and assessed by the Committee. Initially, based on some simple rules, the initiatives could be rated in terms of their desirability, for example, those with negative impacts or too few positive qualifications could be left out or receive lower consideration. The different mixes of initiatives in each proposed package would result in different impacts on each sustainability dimension that would be easily assessed as proposed in this study. This process would allow identifying if the proposed packages are unbalanced, if a specific dimension is not being considered adequately, or if it does not advance the dimensions enough, for example, because too many of the initiatives are neutral. With these results, the decision maker can choose between different types of economic recovery packages, for example, that impact many sustainability dimensions at the same time, or that has results in fast and short-term benefits for people and the economy, with unbalanced impacts.

Finally, for the future, using a methodology such as this would be a first step towards creating a sustainable recovery index for packages of projects. Based on the dimensions identified, it is possible to advance towards a multicriteria analysis whereby the specific weights of each dimension are determined, using an analytic hierarchy process based on a sustainability expert panel (Canales Cerón, 2006). This index would compare combinations of projects and provide the basis for establishing a sustainability benchmark required for any specific combination of projects.

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Author Contributions

RO, CI and MR conceived and designed the study. AV and JG conducted data gathering and applied the methodology. AU performed statistical analyses. RO, CI, AV, JG and AU wrote the paper.

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Conflict of Interest

The authors have no competing interests to declare.

Research Transparency and Reproducibility

All data and methodologies are available to readers without undue barriers to access.

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