

# Analysis of Financial Components of Intended Nationally Determined Contributions (INDCs)

- Lessons for future NDCs -

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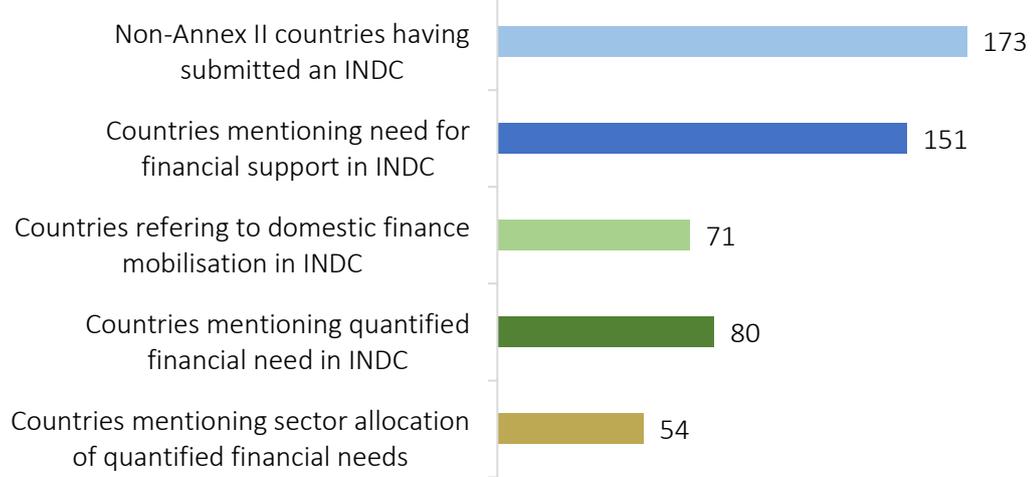
Climate and Energy Area, IGES

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## Key messages

- This paper tries to capture the main characteristics of financial components of INDCs, in order to deepen understanding of developing countries' financial needs. Such analysis will help developed countries and other countries encouraged to provide or continue to provide such support voluntarily by the Paris Agreement consider what kind of financial support is provided to developing countries. For this purpose, this paper examines 151 countries, which that submitted INDCs to the UNFCCC until July 2016 among the Non-Annex II countries. There are 173 Non-Annex II countries in total, so this paper covers 87 % of the Non-Annex II countries.
- Out of the 151 countries covered, 129 countries (86%) countries mention a request for international support. While, 70 countries (46%) refers to domestic financial mobilization. Additionally, 126 countries (84%) state that their INDC targets or actions are conditional upon international financial support. With regard to the extent to which INDCs show how countries are using financial sources they request, 61 countries (45%) do not mention this matter. In terms of sector, 103 countries (68%) request support for the mitigation and adaptation sector in their INDCs.
- 80 out of the 151 countries quantify how much finance they need and/or request for their INDC implementation. However, when it comes to specific methodologies for such quantification, out of these 80 countries, only 29 show the sources they cite or used for their estimation.
- The total cumulated financial needs express in the INDCs of the relevant 80 countries will come to USD 5,475.13 billion by 2030. Countries that express quantified financial needs in their INDCs are mainly countries in Asia and Sub-Saharan Africa, with 47% (USD2,567 billion) and 45% (USD2,456.9 billion) respectively.
- Out of the 80 countries quantifying financial needs, 54 countries allocate those financial needs to mitigation and/or adaptation, while 26 countries do not allocate them to any specific sector. Among the total amount of financial needs of USD 5,475.1 billion, USD 2,667.5 billion are allocated to mitigation and USD 619.9 billion to adaptation (adding up to USD 3,287.4 billion for both sectors). This leaves a gap of USD 2,188 billion of financial needs that are not allocated to a specific sector. This gap highlights the different ways in which financial needs are expressed in INDCs.
- Based on the analysis, this paper makes some recommendations to developing and developed countries. For developing countries that are seeking international financial support, it is recommended to specify methodologies to estimate the cost of mitigation/adaptation and ways of using the requested finance. Recommendations to developed countries and other countries that provide financial support highlight the importance of providing support for INDCs especially on cost estimation of mitigation/adaptation. For both, it is very important to develop a common methodology of INDC finance, especially for costing.

Figure i: Number of countries mentioning various references to financial needs in INDCs





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# 1. Introduction

Based on a decision at COP19, all Parties were invited to initiate or intensify domestic preparations for their intended nationally determined contributions (INDCs) applicable to all Parties towards achieving the objective of the Convention as set out in its Article 2 and to communicate them well in advance of the COP21 (1/CP.19). Then a COP20 decision invited Parties to consider including an adaptation component in their INDCs (1/CP.20). On finance, however, the COP20 decision did not conclude whether INDCs include finance or not. Developed countries have been hesitant to include financial components in their INDCs, because commitment to specific financial support in their INDC sometimes is limited by the parliamentary process (Carbon Brief, 2015). On the other hand, most of the developing countries mentioned financial components in their INDCs, often as requests for international financial support, because developing countries think that making long-term plans for mitigation is difficult without funding (Carbon Tracker, 2015).

As a result, developed countries do not include financial components in their INDCs, whereas most of the developing countries do. Since finance has been always subject to debate in past UNFCCC negotiations e.g. the financial target provided by developed countries and balance of finance between mitigation and adaptation, it would be valuable to analyse what is mentioned in the INDCs of developing countries with regard to finance. Hence, this paper tries to capture the main characteristics of financial components of INDCs, in order to deepen understanding of developing countries' financial needs. Such analysis will also help developed countries consider provision of financial support to developing countries.

After explaining the methodologies of analysis in Section 2, Section 3 and 4 will show the outcome of the analysis of financial components of INDCs.

There is some literature that includes finance in INDCs. One of the most eminent is produced by the UNFCCC, pursuant to the COP20 decision, covering 161 INDCs from 189 Parties submitted by 4 April 2016 (UNFCCC, 2016). However, it does not analyse the finance elements in detail, but rather focuses on estimation of the aggregate greenhouse gas (GHG) emission levels in 2025 and 2030 resulting from the implementation of the INDCs (UNFCCC, 2016). More research analysing INDCs was done by Asian Development Bank (2016), but the scope was limited to 38 ADB member countries, which submitted INDCs to the UNFCCC. The ADB paper sheds light on overall regional characteristics in Asia, but did not delve deeply into the characteristics of financial components in a quantitative manner.

This paper therefore looks into the financial components in INDCs and conducts a deeper analysis on what developing countries say about finance in INDCs.

## 2. Methodology of the analysis

This paper examines all 151 countries Non-Annex II countries that submitted INDCs to the UNFCCC by July 2016. There are a total of 173 Non-Annex II countries<sup>1</sup>, so this paper covers 87 % of the Non-Annex II countries.

In Section 3, by reviewing all 151 countries, the paper first examines developing-INDCs in the context of the following perspectives: (1) whether the INDC refers to a request for international support; (2) whether INDC refers to efforts for domestic finance mobilisation; (3) whether finance is conditional to mitigation or not; (4) which sector requested support (mitigation/adaptation); (5) what the content of the request was (programme or project level); (6) what the sources of quantification were. These perspectives were chosen because these will contribute to discussion how much is needed for tackling climate change and how it is mobilised. This is one of the main discussion within/outside of the UNFCCC. Definition and criteria for classification are provided in Appendix 1.

Section 4 presents the number of financial needs expressed in INDCs. Adjustments were sometimes necessary to display data in a uniform way. Main adjustments were: financial needs expressed in other currencies than US dollars were converted following the rate of the INDC submission year; and financial needs expressed as a “per year” amount were converted to a total number needed by 2030. Moreover, whenever a country mentioned different numbers based on different scenarios or target years, this paper accounts only for the highest financial number, in order to represent the upward scenario of financial needs.

Last but not least, it is noteworthy that this analysis simply focuses on what INDCs indicate, not what the actual financial needs are in reality. For instance, some countries might not mention in their INDCs that they have domestic financial mobilisation policy, but in fact they do have such a policy in place.

## 3. Trend of financial element in INDCs

While many countries mention financial needs in their INDC, not all go into the same level of detail when laying out their exact expectations from financial flows. Some countries only mention policy implementation costs while others mention a direct need for international support. Some only mention economy-wide financial estimates, while others present some form of sector allocation,

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<sup>1</sup> As of July 20, 2016, there are 197 Parties to the Convention and Annex II countries are 24 Parties: Australia, Austria, Belgium, Canada, Denmark, European Economic Community, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom of Great Britain and Northern Ireland, the United States of America

notably between adaptation and mitigation. Figure 1 shows the overall different levels of detail in three aspects of financial aspects of INDCs: calculation of financial needs, specification of financial needs and specification of financial spending.

Figure 1: Different levels of detail in INDCs

	How to calculate? (Quantification of finance)	How to mobilize? (Source of finance)	How to spend? (allocation of finance)
not detailed	No mention	No mention	No mention
	Mention methodologies of with reference	Distinguish btw international finance and domestic finance	Specify sector allocation (mitigation/adaptation)
More detailed	Mention methodologies of quantification	Mention policy measures of mobilisation (plan and ongoing)	Specify sub-sector allocation (e.g. renewable sector)  Specify individual project

Source: IGES

First of all, regarding the quantification of finance, countries can be classified into three types: (1) those which did not quantify; (2) those which quantify without reference to methodology or sources of calculation; and (3) those quantify with reference to methodology or sources of calculation. Secondly, in terms of sources of financial needs in INDCs, again not many countries specified what these sources were. These countries can be classified into three: (1) no mention of sources; (2) mention but just distinguish between international and domestic finance; (3) mention with some policy measures for mobilisation (planned and ongoing). Thirdly, in terms of allocation of finance, countries can be classified into four: (1) no mention about allocation; (2) mention only mitigation/adaptation allocation; (3) mention sub-sector allocation; and (4) mention specific individual projects.

The INDCs that express a quantified need for international financial support provide a useful overview of the expected financial flows. However, some countries show sources or methodologies of calculation, but others do not. In this way, the level of detail for the financial element differs country by country.

### 3.1 Reference to international support

As shown in Figure 2, 129 countries (86%) of the developing countries refer to requests for international support in some way. There are 13 countries that do not refer to these:

Albania, Azerbaijan, Belarus, Brunei, Chili, China, Israel, Montenegro, Republic of Korea, Russia, San Marino, Serbia and Singapore.

What is common among these countries is that they are classified into above the 'Upper middle income' group, according to the categorisation of World Bank Data (Table 1).

The fact that a country does not refer to international support in its INDC does not directly mean that this country is not expecting or requiring any financial support at all. On the other hand, it can be said that countries which do not refer to international support are categorised as relatively 'richer' countries, based on the World Bank category.

Figure 2: Reference to international support

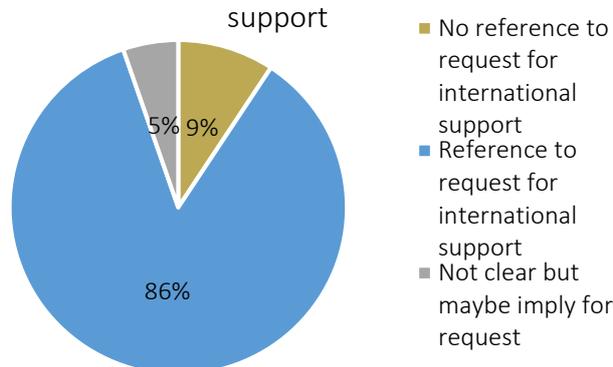


Table 1: Categorisation of the countries according to the World Bank Income Group

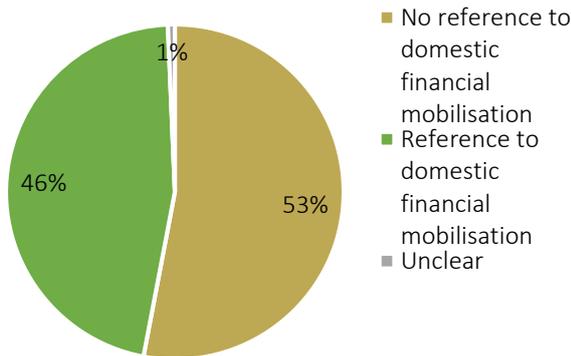
Country	World Bank Income Group
Albania	Upper middle income
Azerbaijan	Upper middle income
Belarus	Upper middle income
Brunei	High income
Chili	High income
China	Upper middle income
Israel	High income
Republic of Korea	High income
Montenegro	Upper middle income
Russia	Upper middle income
San Marino	High income
Serbia	Upper middle income
Singapore	High income

Source: World Bank Data

### 3.2 Reference to efforts for domestic finance mobilisation

International financial support is not the only financial source for mitigation and adaptation by developing countries. Domestic finance has already been playing a role in combating climate change. For instance, over the past few years, there has been a growing trend to establish National Climate Funds as a means of managing climate finance from domestic and international sources (UNDP, 2012).

Figure 3: Reference to Domestic Financial Mobilisation

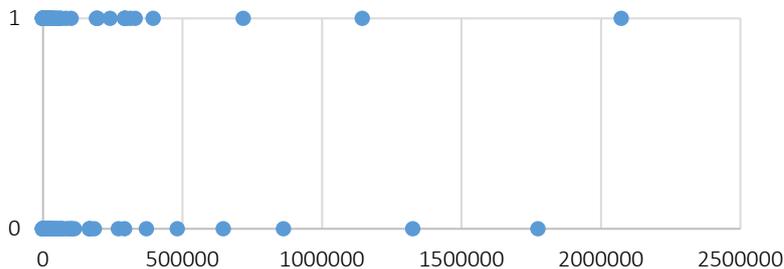


As Figure 3 shows, among 151 countries, 70 countries (46%) refers to domestic financial mobilisation in some way.<sup>2</sup> Some of the countries which refer to domestic financial mobilisation are those not requesting international financial support such as China, Singapore, Israel, San Marino and Chili. Various kinds of domestic measures are listed up in these INDCs. For instance, China lists a variety of measures such as exploration of new investment and financial mechanisms for low-carbon development, increase in budgetary

support, preferential taxation policies, green procurement policy system, reform of the pricing taxation regime, and improvement of disaster insurance policy against climate change. INDCs of Sierra Leone mentions that it was recommended to create a dedicated Sierra Leone Climate Fund (SLCF) and resources should be mobilised both domestically and internationally.

Figure 4 examines whether there is any correlation between countries that refer to domestic mobilisation and the GDP of each country among 151 countries, but according to this Figure, there seems to be no clear correlation. Hence, it cannot be said that larger economies more refer to domestic financial mobilisation.

Figure 4: Co-relationship between GDP and reference to domestic financial mobilisation  
unit: current USD million in 2015



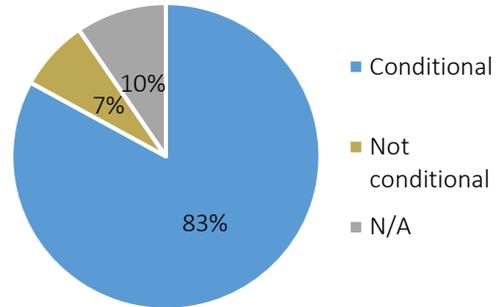
1: referring to domestic financial mobilisation  
0: not referring to domestic financial mobilisation

<sup>2</sup> Countries with 'reference to domestic finance' include countries which do not specifically mention their intent on financial mobilization domestically. If the INDCs mention that they touch on a measure or amount of domestic financial mobilisation or domestic finance, those countries are categorised into 'reference to domestic finance.'

### 3.3 Financial conditions to INDC commitments

Referring to international support in their INDC is a different matter from whether the finance is conditional to their mitigation target. Our analysis found that 126 out of 151 countries (84%) state that their INDC targets or actions are conditional on international financial support. Eleven countries set unconditional mitigation targets: Andorra, Brazil, Côte d'Ivoire, Gabon, Grenada, St. Vincent and the Grenadines, Saudi Arabia, Somalia, South Africa, Turkey and Ukraine.

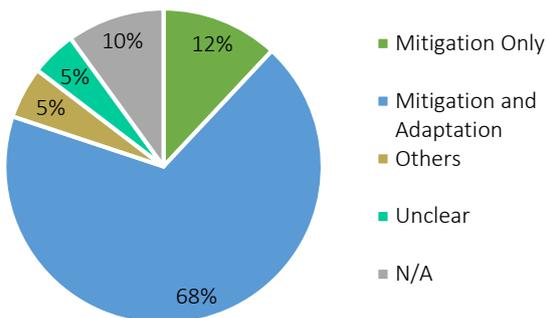
Figure 5: Whether INDC implementation is conditional to international support



It is noteworthy that this paper takes broad definition of financial ‘condition’ to implement INDCs. This is because many countries directly mention that finance is a condition to implement INDCs, but some simply mention they ‘require’ international finance or financial support to implement such as Nepal and Bahama, which may suggest that financial support is condition. On the other hand, the definition excludes the other weaker expression of necessity of finance e.g. in the case of the INDC which only state that it (will) receive international support such as Turkey, it counted as ‘not conditional.’

### 3.4 Sector requested for support

Figure 6: Sector requested for international support

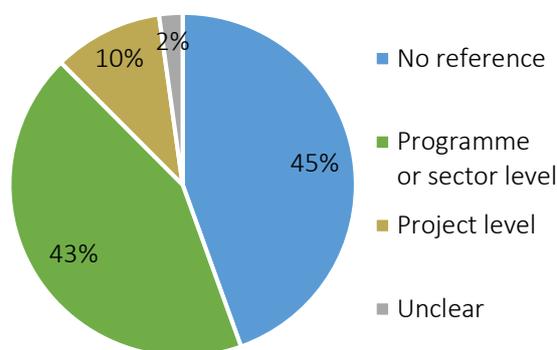


Among 151 countries, 103 countries (68%) requests support for mitigation and adaptation in their INDCs. Some only refer to mitigation support and still others refer to support for loss and damage or response measures. Main adaptation measures often mentioned by INDCs covered diverse sectors such as water resource management, disaster risk management, and coastal protection.

### 3.5 Programme/Sector or Project

Although it is often discussed that scaling-up climate finance is important and that implementing INDCs requires huge financial support, how to make use of the financial sources is equally important. As shown above, most countries mention their need for international finance and half of countries mention efforts for domestic finance, but there is uncertainty about how the finance will be used. This aspect is important both in terms of international finance and domestic finance. Domestic finance is of interest to taxpayers, whereas developed countries or donors will be responsible for the effective use of international finance. As shown in the Figure 7, among 137 countries (excluding countries not requesting international finance out of the 151 countries), 59 countries (43%) indicates how they will use financial resources at the programme or sector level, and 14 countries (10%) indicates at the project level. Hence, almost half of the INDCs indicate use of finance in some way, but 61 countries (45%) do not indicate this or are unclear. However, more detailed reference to of how to use the finance does not necessarily mean that finance is used more effectively. Having said that, donors may be more convinced if the way the finance will be used is specified in detail.

Figure 7: How INDCs demonstrate how to use financial sources?



### 3.6 Sources of quantification

Among 151 countries, 80 countries quantifies how much they need or request for their INDC implementation. However, when it comes to the methodologies of quantification, among 80 countries only 29 countries show the sources they cite or use for their estimation. The others do not refer to any kind of reference for the methodologies. Looking into detail, the countries with grounds for quantification can be categories into the following three types:

- (1) Reference from outcome of international support e.g. Nigeria from the World Bank report “Low Carbon Development Opportunities for Nigeria (2013)”
- (2) Reference from national policy report e.g. Tuvalu from is Tuvalu’s Master Plan for Renewable Energy and Energy Efficiency (TMPREEE) and Mali from National Sustainable Development Plan
- (3) No reference but showing breakdown to some extent e.g. 1) Nauru showing breakdown for Solar PV (USD 42 million for Solar PV ) and demand side energy efficiency measures (USD 8 million) in the case of; 2) Burundi showing breakdown at the programme level such as Climate risk adaptation and management (3.7 mil USD) and mitigation of greenhouse gas emissions and low carbon developments (1,446 mil USD) ; 3) Burkina Faso showing information at the project level with target-years in 2020, 2025 and 2030 with constant 2015.

In this way, various methodologies are used for quantification of financial needs in the INDCs. This is essentially because there are no instructions or guidance finance part. In addition, there are no internationally-agreed methodologies for costing mitigation/adaptation needs. In 2015, a COP 21 decision included a request to the Subsidiary Body for Scientific and Technological Advice (SBSTA) to develop modalities for the accounting of financial resources provided and mobilised through public interventions. Additionally, in the future, there will be a need to develop a common methodology for adaptation and mitigation costing for INDCs.

## 4. Amount of quantified financial needs in INDCs

Among the 151 developing countries that have submitted an INDC, 80 countries express quantified financial needs. Although, as seen in section 3.6, the methodologies and sources used by each country to estimate financial needs remain mostly unclear, the expressed amounts provide some indication on the range of funding required by developing countries. This Section analyses the characteristics of total quantified financial needs mentioned in INDCs (4.1), their geographic distribution (4.2) and the allocation of requested finance between climate mitigation and adaptation (4.3).

### 4.1 Total amount of quantified financial needs in INDCs

The total cumulated financial needs expressed in INDCs by the 80 countries that quantify financial needs amount to **USD 5,475.13 billion** by 2030. This result differs from the one of previous studies such as Zhang & Pan (2016), which referenced 64 countries with quantified financial needs for a total of USD 4,592.9 billion needed by 2030. However, both these findings seem coherent, given the gap in the number of countries included in the respective methodologies.

### Box 1: Overview of current flows of climate finance

Although gaps in knowledge and data usually make it difficult to assess the exact amount of climate finance available (Gupta & Harnisch, 2014), a recent study from the Climate Policy Initiative (CPI) provides a compelling outlook of current climate finance flows. Among the total 391 billion of climate finance spent in 2014 globally, the study finds that USD 215 billion USD – excluding Western Europe, the Americas, Japan, Korea and Israel – were directed to developing and emerging economies (Buchner, 2015).

Major accounting differences hinder the direct comparison between financial needs expressed in INDCs and amounts of climate finance referenced in the CPI study. On one hand, the CPI study does not account for public budgets dedicated to climate actions and private investments in energy efficiency, including transport, land use and adaptation. On the other hand, the absence of clarity on the accounting rules and sources used for financial need quantification in INDCs make it difficult to understand the exact scope of the requested finance.

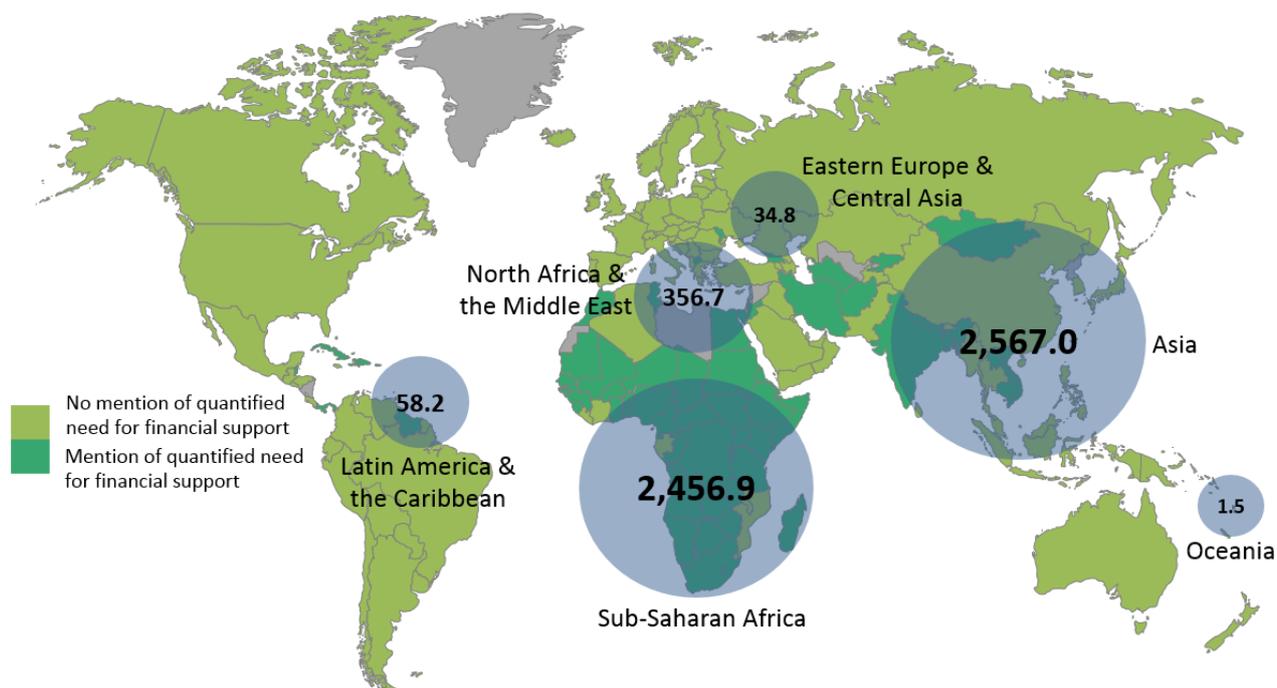
However, a comparison of both amounts appears to be relevant to a certain extent. The CPI study shows that 74% of total climate finance flows and 92% of private investments were raised and spent within the same country (Buchner, 2015). Therefore, if this proportion remains identical in the future, it can be expected that most of the USD 5,475.1 billion needs expressed by developing countries in their INDCs will be financed by and directed to their home country.

The amount of USD 5,475.1 billion could very well increase in the future, as countries that do not quantify their financial needs – notably developing and least developed countries – may do so in the next NDCs to be submitted to the UNFCCC Secretariat, and countries that do quantify financial needs may increase their required amount.

## 4.2 Regional distribution of quantified financial needs expressed in INDCs

It has been shown in the previous section that developing countries express a total financial need of USD 5,475.1 billion in their INDCs. Looking at the geographical distribution of countries where the financial needs originate from, the Map 1 below shows that countries from some regions express more financial needs than countries in other regions. Indeed, most of the quantified financial needs expressed in INDCs originate from countries in Asia and Sub-Saharan Africa, for 47% (USD 2,567 billion) and 45% (USD 2,456.9 billion) respectively. Other regions account for the following share: 6% (USD 356.7 billion) from North Africa and the Middle East, 0.6% (USD 34.8 billion) from Eastern Europe and Central Asia, 1% (USD 58.2 billion) from Latin America and the Caribbean, and 0.02% (USD 1.5 billion) from Oceania.

Map 1: Amounts of Financial Needs expressed in INDC/NDCs by regions (in USD billion)



Source: Institute for Global Environmental Strategies INDC & NDC Database (2016)

In some instances, the amount requested by some countries outweighs by far those of others in the same region. For instance, while India claims to need USD 1,040 billion to implement its INDC (USD 206 billion for adaptation and USD 834 billion for moderate mitigation actions), its scaled-up climate action plans, which are being taken into account in this study, require “at least” USD 2.5 trillion. This amount represents on its own 97% of the financial needs of countries in Asia, and 45% of total quantified financial needs globally. Similarly, cumulated costs of adaptation and mitigation costs in all sectors in South Africa’s INDC amount to USD 1.4 trillion, which corresponds to 59% of the financial needs of countries in Sub-Saharan Africa, and 26% of total quantified financial needs.

This distribution has to be put into perspective with the number of countries that express quantified financial needs in their INDC. As shown in Table 2, with 80 countries requesting USD 5,475.1 billion, the average required amount per country is USD 68 billion. This result varies among regions. Indeed, while financial needs in Sub-Saharan Africa amount for USD 2,456.9 billion, the average required financial amount by country in the region is only USD 60 billion for 41 countries (out of 49 in total). On the contrary, Asia, with a similar total amount (USD 2,567 billion), has an average required amount per country of USD 320 billion for 8 countries (out of 22 in total).

Table 2: Average amounts of quantified financial needs in INDCs per region

Region	Number of countries with quantified financial needs in INDC	Total financial needs (in USD billion)	Average required financial amount per country (in USD billion)
Asia	8	2,567.0	320
North Africa & the Middle East	5	356.7	71
Sub-Saharan Africa	41	2,456.9	60
Eastern Europe & Central Asia	5	34.8	7
Latin America & the Caribbean	13	58.2	4
Oceania	8	1.5	0.1
TOTAL	80	5,475.1	68

Source: Institute for Global Environmental Strategies INDC & NDC Database (2016)

Regional distribution of financial needs does not match the proportion of current flows of climate finance. Although estimation of climate financial flow by Buchner (2015) includes domestic finance, which accounts 74% of climate finance, it shows some indicative figure to compare with our result. While the regions of Asia and Sub-Saharan Africa represent respectively 47% (USD 2,567 billion) and 45% (USD 2,456.9 billion) of financial needs from developing countries, the financial flows dedicated to those regions in 2014 in Asia<sup>3</sup> represented 63% (USD 136 billion) of financial flows directed to developing countries, against 5.6% (USD 12 billion) for Sub-Saharan Africa (data adapted from Buchner, 2015). The small share of financial flows directed to Sub-Saharan countries does necessarily represent low financial amounts in an absolute sense, but the small size of their respective economies makes this share appear proportionally small compared with financial flows directed to larger economies (Westphal and Linthorst, 2015).

Conversely, countries in Latin America and the Caribbean represented 13% (USD 28 billion) of climate financial flows to developing countries in 2014 (Buchner, 2015), while the region only accounts for 1% of the total financial needs expressed in INDCs. The gap between climate finance flows and financial needs expressed in INDCs in the Latin America and the Caribbean region might signify that these countries used fewer INDCs as a platform to request financial support than Sub-Saharan countries.

<sup>3</sup> The Asian region in the CPI report was counted as the cumulated regions of East Asia and the Pacific and South Asia.

### 4.3 Allocation of financial needs between adaptation and mitigation, as expressed in INDCs

Section 3.1 has shown that not all countries that quantify financial needs in INDCs allocate those needs to specific sectors. Among the 80 countries quantifying financial needs, 54 countries allocate them between mitigation and adaptation, while 26 countries do not allocate them at all, leaving unknown the expected destination of the required finance. As summarised in Figure 8, 46 countries mention quantified financial needs for mitigation, among which 33 countries mention both sectors and 13 countries mention mitigation only. On the other hand, 41 countries quantify their financial needs for adaptation, among which 33 countries mention both sectors and 8 countries mention adaptation only.

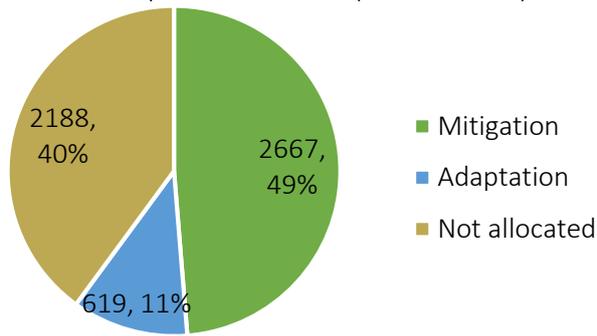
Figure 8: Allocation of quantified financial needs in INDCs by number of countries



Source: IGES

Regarding financial amounts, as shown in the Figure 10, among all developing countries that quantify the financial needs, 49% of financial needs are related to mitigation (USD 2,667.5 billion), 11% target adaptation (USD 619.9 billion), and the last 40% (USD 2,188 billion) are not explicitly allocated to a specific sector. It can be noted that while a similar number of countries requests financial support in both sectors, the amount of mitigation needs exceed adaptation needs by more than four times.

Figure 9: Allocation of quantified financial needs expressed in INDCs (in billion USD)



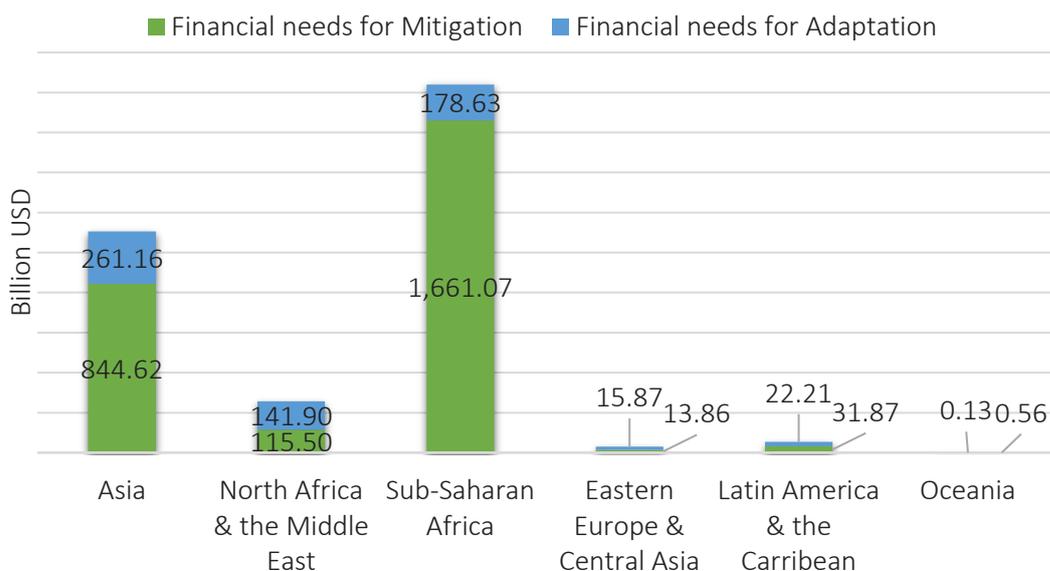
Source: Institute for Global Environmental Strategies INDC & NDC Database (2016)

Cumulated financial needs for mitigation and adaptation add up to USD 3287.4 billion, which falls far short of the total amount of financial needs of USD 5,475.1 billion. This gap – the 40% (USD 2,188 billion) of financial needs that are not allocated to a specific sector – highlights the different ways in which financial needs are expressed in INDCs. Some countries choose to express financial needs as a single total amount; others express quantified financial needs for mitigation and adaptation without mentioning a total amount; and the last category express both a

total amount and financial needs for mitigation and adaptation. In some INDCs, the total amount of financial needs exceeds the sum of mitigation and adaptation needs. In this case, the remaining amount corresponds to additional costs that are not counted as mitigation or adaptation per se (e.g. capacity building, education...). Overall, differences in financial needs allocation by sector mean that even countries referring to quantified financial needs still have a margin of improvement regarding the level of detail of their financial communication (see Figure 1).

Regarding geographic distribution of sectoral financial needs, there is a similar distribution to the one for total financial needs. As shown in Figure 10, 32% of financial needs for mitigation (USD 844.6 billion) originate from Asia, and 62% (USD 1661.1 billion) from Sub-Saharan Africa. Regarding adaptation, 42% of financial needs (USD 261.2 billion) come from Asia, 29% (USD 178.6 billion) from Sub-Saharan Africa and 23% (USD 141.9 billion) from North Africa and the Middle East.

Figure 10: Allocation of Financial Needs between Mitigation and Adaptation in INDCs by region (in billion USD)



Source: Institute for Global Environmental Strategies INDC & NDC Database (2016)



Overall, among cumulated financial needs allocated to both sectors, 81% (USD 2,667.5 billion) is directed to mitigation and 19% (USD 619.9 billion) to adaptation. In the past, many developing countries argued in climate finance negotiations under the UNFCCC that there should be a balanced financial allocation between mitigation and adaptation. The global of climate finance flows show that the trend has weighted toward mitigation. For instance, only between 11 and 24% of climate finance targeted adaptation as Fast-Start Finance, through multilateral climate funds and Multilateral Development Banks support, though there is some evidence that adaptation finance has been increasing (UNFCCC, 2014).

Although 103 countries (68%) requested support for mitigation and adaptation in their INDC, when it comes to financial amount, results show contradictory numbers, as mitigation finance needs far outweighed adaptation needs expressed by INDCs. However, it may not be correct to interpreted this as meaning that adaptation needs are far less than mitigation needs in reality. If so, it may be worthwhile to look into why this contradiction occurred.

It is true that there are some literature that argues mitigation should be prioritised such as Kane & Shogren (2000) and Bruin, Dellink, & Agrawala (2009) who state that, due to the uncertainty of the effects and damage location of climate change, mitigation investments should have the priority over adaptation investments and Lecocq & Shalizi (2007) suggesting that investments in adaptation should wait until more certainty is reached. However, as seen in Section 3.4, among 151 countries that refer to international support, 103 (68%) requested support for mitigation and adaptation while only 18 countries (12%) refer to only mitigation. Hence, it may be incorrect to assume that many countries want less adaptation than mitigation finance. In fact, a number of developing countries already mention in their INDCs material impacts of climate change in their countries. This small amount of financial needs for adaptation might result from the nature or origin of INDCs. Indeed, the discussion on INDC first began with mitigation, not adaptation, and even for developing countries, the mitigation component was regarded as the main component of INDCs. It might also result from the fact that mitigation cost calculation has been more common compared to adaptation among developing countries. Or, it may be lack of/ less capacity and knowledge on cost estimation for adaptation, compared to that of mitigation.

It is, however, too early to conclude the reasons behind this. On the other hand, mitigation/adaptation financial needs should not compete with each other and ideally, there should be more interconnected finance between adaptation and mitigation. Indeed, deeper analysis reveals that the complementary relationship of adaptation and mitigation varies positively or negatively depending on specific sectors, implying that some sectors offer particular opportunities for synergies (Klein, Held, & Ragwitz, 2007).

## 5. Conclusion and Policy Recommendations

The above section analyses the characteristics of INDCs submitted by developing countries. It shows that while many countries, except for some large economies, requested international support, almost half of them are seeking both international and domestic finance. On the other hand, with regard to how to use financial sources, 61 countries (45%) did not mention anything at the programme/project level. Hence, it is not known how countries want to allocate the requested finance.

The total cumulated financial needs by the 80 countries' INDCs amount to USD 5,475.13 billion by 2030. Most of the quantified financial needs expressed in INDCs are in Asia and Sub-Saharan Africa: 47% (USD 2,567 billion) and 45% (USD 2,456.9 billion) respectively. Although this paper calculated the financial needs of 80 countries that quantified how much they need or request for their INDC implementation, only 29 countries show the sources they cited or used for their estimation. Hence, the number is not constituted by common methodologies and therefore, differences may arise between countries, depending on the methodologies.

Based on above analysis, this paper makes the recommendations below for policymakers both to developed and developing countries.

### *For developing countries:*

- It is preferable to specify how cost or financial demand is quantified, if developing countries show the amount of finance.
- Some countries do not mention adaptation or request for adaptation finance. If they do need such support, it would be preferable for them to specify that they need adaptation
- It is desirable to specify the use of finance in a detailed manner, where possible and available, as such explanation on how much a country needs for support would be more convincing to donors.

### *For developed countries and other countries that provide financial support:*

- Support for INDC has been argued in the UNFCCC negotiation already, but this paper demonstrated that it would be valuable for developed countries to support quantification of INDCs costing both for mitigation and adaptation, but with the same or at least similar methodologies among donors. If enough capacity was provided to support financial estimation, quantification of financial needs would be more accurate and comparable.

### *For all countries*

- It would be important to have an agreement on the format of INDCs' financial elements part. Especially regarding costing the financial needs, it would be difficult to agree on that in detail. However, currently many countries show only numbers or numbers with a wide range of methodologies and this situation does not exhibit any consistent and persuasive demand or cost estimation.

## Appendix1: definition and criteria of classification

For the analysis of INDC, this paper establishes definitions/criteria classify countries.

- **3.3: Whether finance is conditional to mitigation or not:** this paper also takes a broad definition of the financial 'condition' to implement INDCs. This is because many countries directly mention that finance is a condition to implement INDCs, but some mention they require international finance or financial support to implement such as Nepal and the Bahamas. In addition, the definition excludes the other weaker expression of necessity of finance e.g. in the case of the INDC which only state that it (will) receive international support such as Turkey, it is counted as 'not conditional.'
- **3.5 the content of the request (programme or project level);** when there is a difference between mitigation and adaptation in the level of detail, this paper applies to the criteria for which more detailed mention is applied e.g. if mitigation components are more detailed than those of adaptation, then mitigation components are the criteria for classification.
- **3.6 Sources of quantification:** These countries are included even when the INDC do not show the methodology in detail, but included if they refer to any kind of reason or source for their estimation. Also, this paper takes a broad definition of 'quantification of amounts needed or requested'. INDC that 'quantify the amounts needed or requested' include INDCs that show not only direct reference to overall cost estimation of INDC, but also show project cost or budget partially needed.

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The authors would like to thank Dr. Kentaro Tamura  
for his valuable comments on the earlier version of this paper.

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The views expressed in this working paper are those of the authors and do not  
necessarily represent of IGES.

IGES Publication Code WP1509

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