Methodological guidance

Determining the 'Size' of premium and capital support (PCS) at macro-level

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1. Background

This document proposes methodological guidance to determine the 'size' of premium and capital support (PCS) at macro-level. It is based on the 'SMART PCS Principles', developed by the InsuResilience Global Partnership (IGP) to scale-up the Climate and Disaster Risk and Finance Insurance (CDRFI) solutions (see Box 1).

Conceptual guidance on what considerations need to be taken to determine the size/amount of PCS is provided across all *five* SMART PCS Principles. Principle 'A' (accessibility) in the SMART PCS concept note (hereafter Policy Note) argues "transparent, uniform and consistent criteria for needs-based PCS levels should be formulated" to guide donors in determining an "uptake-enabling" size of PCS intervention (Töpper and Stadtmüller, 2022).

Box 1: The SMART premium and capital support principles

S – Sustainable impact for the most vulnerable: To enable tangible, lasting change in the lives of those most vulnerable to disasters, PCS should be used to fund risk transfer mechanisms coupled with effective, development-oriented delivery systems.
M – Value for money: To maximise poor and vulnerable countries' and people's resilience for each dollar of premium or capital support, PCS initiatives should support needs-based CDRFI products that add value and entail a clear assessment framework that makes improvements in resilience verifiable and comparable. Smart PCS proactively and effectively crowds-in private capital rather than undermining private sector potentials.
A – Accessibility: Smart PCS is needs-based, (climate) risk-adjusted, and aligned with appropriate measures for enabling access, while empowering beneficiaries and promoting client ownership of the solutions employed.
R – Resilience-building incentives: To build financial, physical and social resilience, only risks that are too costly to further reduce should be absorbed by risk financing instruments, and only risks stemming from low-frequency and high severity events should be transferred via insurance. Reducing premiums through PCS should not alter this but keep incentives to reduce risks in place.
T - Transparency and Consistency: To empower recipients and maximise synergies, PCS should be provided and employed in a manner that promotes transparency and accountability towards recipients and at-risk communities as well as consistency and coordination among support offers and providers.

(Source: Töpper and Stadtmüller, 2022)

The Policy Note suggests an indicative formula to calculate externally supported (donor) share of the premium for a government. The formula is proposed as a fraction that reflects need-based considerations, along with a scaling factor that needs to be defined in an evidence-based fashion to suit different country contexts. The formula proposed is:

$$P_e = t_n * \frac{expected\ contingent\ government\ liabilities\ from\ disasters}{total\ government\ budget} \quad \text{... (1)}$$

$where,\ P_e + P_p = P_a\ and\ P_a = 1$

Where P_e is the externally supported premium share, P_p is the remaining premium share payable by the policyholder (country), and P_a is the full, actuarially priced premium charged by the risk carrier. *t* is a scaling factor that could decrease (or, under specified conditions, increase) annually (year *n*). Values for the scaling factor (t_n) could be in the range of '0' (absolute exclusion) and '1' (absolute inclusion).

In addition to the SMART PCS Principles, this guidance document is based on and aligns with the IGP's monitoring and evaluation (M&E) framework (IGP 2021), IGP's pro-poor principles (IGP 2019) and conceptual guidance provided in Panda et al. (2021a; 2021b; 2021c), World Bank (2017) and Vivid Economics et al. (2016), among others. Insights from the key informant interviews (KIIs) conducted as part of the political economy analysis on CDRFI uptake and consultation with the Advisory Working Group (AWG) were particularly helpful in developing this guidance document. Further, the methodology suggested in the document builds on the funding/aid allocation mechanisms prevalent at the global scale, mostly used by multilateral development institutions and funds to determine the 'allocation share' for different recipient countries (see Section 4.1.2 for more details).

The rest of the document is structured as follows. The next section describes how and where to use this guidance. Section 3 presents a critical review of the practical feasibility of the suggested indicative formula (in Principle 'A') for sizing PCS interventions. Section 4 presents a systematic approach to determine the value of the scaling factor (and/or allocation share) by examining existing evidence and building on stakeholder and expert consultations.

2. Where to use this guidance document

The purpose of this document is to provide methodological guidance to develop a transparent and consistent method for allocating premium support to countries based on their needs for financial support and performance in effectively furthering disaster risk management (and financing) actions. This guidance document is developed to support actors who are part of the IGP (e.g., the Programme Alliance) in deciding appropriate allocations of premium support, differentiated by different country categories. However, the guidance could be used more widely by policymakers and practitioners who are responsible for such allocation decisions.

This guidance document uses a multi-criteria decision model (MCDM)[2] to define the scaling factor. The approach used here is predominantly quantitative and considers factors that are readily quantifiable and widely available for a larger set of countries. Primarily, it builds on

[2] Multi-criteria decision models are typically used to solve decision making problems where multiple criteria (or factors, objectives) have to be considered collectively to choose or prioritise among them. This also includes allocation of fixed/scarce resources across alternatives (in this case, recipient countries). MCDM could be based on quantitative, qualitative or both types of criteria.

the performance-based systems (PBA) used to allocate financial resources by multilateral development institutions and funds.

The methodological guidance provided in this document is intended to define values for the scaling factor in an evidence-based fashion[3]. However, with necessary adjustments, the approach depicted in this document could be applied to directly (without the fraction) derive the 'allocation share' by country, in cases where decisions regarding allocating a 'donor fund'[4] among recipients are under consideration.

This guidance document applies in the following cases:

i. where PCS allocation is considered for macro-level CDRFI (particularly, sovereign risk insurance)
ii. at the time when PCS prioritisation, allocation and appraisal decisions are made
iii. for countries eligible for PCS support (e.g., countries that in the first place meet eligibility criteria for PCS support, such as those suggested in the Policy Note (see Principle 'S'))
iv. it is best suited for prioritising PCS allocation among a group of countries[5] (e.g., V20 Group, IDA[6] eligible countries, countries on the DAC list of ODA[7] recipients, SIDS[8], among others) and/or members of a sovereign risk pool
v. it is best suited to be used in the context of the suggested formula to calculate P_e

The proposed approach has some limitations, notably: (a) it might not be well suited for allocation decisions at global scale[9]. This is because it might not fully capture the contextual difference among all the countries of the world. Therefore, as noted above (in point iv), the suggested approach is best suited for use across a smaller group of recipient countries already identified as having relatively similar needs and where there is a need to make appropriate and meaningful comparisons within this group of countries; and (b) the value of externally supported premium (P_e) depends on the value of suggested fraction in the formula and therefore with a change in the factors that represent the fraction, the suggested approach might have to be adjusted as well.

[3] Before doing so, feasibility of the suggested formula, in terms of its practical use is also reviewed in Section 3.
[4] Donor funds here represent a fixed sum of finances at a particular period (commonly, known as replenishment period) that donors aim to allocate to recipient countries.
[5] This is in line with Principle 'S' where it is argued that PCS allocation prioritisation should go beyond the basic eligibility. For instance, IDA eligibility for PCS could be a proxy for countries with severely restricted ability to pay, but further prioritisation of low-income countries might be required.
[6] International development association (IDA) eligible countries, see here.
[7] Development assistance committee list of countries for the official development assistance, see here.
[8] Small island developing states
[9] This is a common limitation with various performance-based systems of fund allocation (see Section 4.1.2 and Annex 1).

3. Feasibility of the 'fraction' in the proposed SMART PCS sizing formula

Based on the review of literature and consultations with experts and Advisory Working Group members, the following limitations of the proposed fraction (in the suggested formula, see Section 1) are identified, in terms of its applicability for practical purposes. Possible remedies to these limitations are also suggested.

Limitations of the proposed fraction with possible remedies:

(a) Ambiguity on contingent liabilities: The Policy Note does not clearly define the value (meaning) of the numerator in the proposed criteria. What remains to be defined is whether the term 'expected contingent government liabilities from disasters' indicate *explicit*[10] or *implicit* or both types of contingent liabilities for the government. Further, short-term (response and early recovery) and long-term (long-term recovery and reconstruction) contingent liabilities may be very different and therefore should be differentiated. While there are some frameworks available for quantifying contingent liabilities (see Gamper et al, 2017), they are generally not well defined and coded by governments, particularly in low-income countries (see, Hochrainer-Stigler et al., 2018; 2017; Mechler et. al., 2016). This makes it difficult to quantify and use them for a wider and meaningful comparison. As Gamper et al (2017) imply, implicit contingent liabilities are particularly challenging to quantify, and there may be challenges associated with reporting them, if it creates 'a sense of an unconditional guarantee of post-disaster assistance'.

Possible solution: The average annual loss (AAL) expected from a range of different disasters could be used to approximate contingent liabilities, and the cost of sovereign insurance (government share + premium subsidies) could be represented as a percentage of AAL (see World Bank 2017 p.28). In cases where (modelled) AAL is not available, historical losses could be used as a numerator. This approach would have the advantage of using data that is relatively easily available[11]. However, it should be noted that the typical emphasis placed on building damage in AAL estimates will likely make it only an imperfect proxy for either the humanitarian suffering of poor and vulnerable people as a result of disasters (who may not own the assets that suffer damage), or of the additional financial costs that governments may need to incur in responding to the disaster (especially in the immediate aftermath of the disaster). Over time, it is likely that better estimates of the costs associated with responding to disaster events will be

[10] Explicit contingent liabilities are explicitly defined and mandated by law such as liability to reconstruct public infrastructure. Implicit liabilities are moral obligations and not explicitly defined by law, for example, construction of houses for low-income population. (for a detailed discussion, see Mechler et. al., 2016)

[11] Although, depending on the region, historical data on disaster damages (including humanitarian losses) often have incomplete and inconsistent coverage (see Panwar et al., 2020).

developed and IGP should look to make use of any more reliable data as it becomes available[12].

(b) Total AAL or adjusted AAL: The Policy Note does not provide clarity on whether the proposed criteria consider country's total funding requirements (and by extension, total AAL) and adjust for already existing funding mechanisms available with the government to finance its contingent liabilities (risk retained by government), as potentially proxied by the AAL. In practice, it makes economic sense for the government to retain a certain level of risk and therefore the demand for insurance is usually lower than the total funding requirements of a country. For instance, the share of insurance coverage under ARC ranges between 10 – 30% of the total funding requirements of the member countries. Therefore, the question arises as what would be an optimal level of insurance for a country and whether insurance will be provided for the total funding requirements of government[13]?

Possible solution: That part of country's contingent liabilities/AAL/or other measure of disaster response which is financed through other instruments (or part of risk which is retained by the government) could first be excluded from the calculation. For example, if a country has a 'ground-up' AAL of $100m but the government has made use of reserve funds and contingent credit facilities to cover $40m then the adjusted AAL for the purpose of the calculation would be $60m.[14] This type of calculation will be significantly easier in those countries that have a comprehensive DRF strategy in place[15], an activity that is currently being supported by the Global Shield.

(c) Total government budget in the denominator: There are some concerns regarding using 'total government budget' in the denominator. There is a weak theoretical relationship between the numerator (contingent liabilities/AAL) and the total government budget. Therefore, total government budget might increase or decrease over time due to changes in government revenue and/or expenditure across different (and unrelated) sectors, affecting the value of the fraction in the formula.

Possible solution: Instead of total budget, it may be easier to use a measure of overall economic activity such as Gross Domestic Product (GDP) which is easily available, and

[12] For example, the Global Risk Modelling Alliance (GRMA) programme of the InsuResilience Solution Fund (ISF) is designed to foster open-source data and models, which could support IGP in identifying (and developing) reliable disaster data.
[13] See discussion on optimality consideration in Panda et al (2021c, page 17).
[14] One consequence of this adjustment is that greater deliberate risk retention by a government, or the use of other unsubsidised risk transfer instruments, would result in a smaller PCS amount. This could be seen as penalising desirable behaviour. However, it is an adjustment that reflects that the objective need for additional subsidised CDRFI solutions is lower, while, as discussed further in section 4, the scaling factor can be set in a way that provides an incentive for improved disaster risk finance practice.
[15] On the contrary, the risk financing instruments might not be well aligned at the national and sub-national levels particularly in countries without a comprehensive DRF strategy. In such cases, it could be difficult to estimate the funding that is available from these instruments and the extent to which this funding can be relied on depending on the nature of a specific event.

which could provide a better assessment of the overall scale of the impact of the disaster on a country's economic performance. One other alternative that has also been suggested is to use the DRM related budget component of the total budget. However, given the relative fungibility of budget allocations, this could create a strong, undesirable incentive for countries to reduce the size of their DRM budgets over time, so as to appear to have a greater need for PCS.

(d) The upper bound for t_n: Considering that there is an upper limit suggested for the scaling factor ($0 \leq t_n \geq 1$), the outcome of this formula may not be practically useful in calculating the size of PCS intervention by donors (P_e), i.e. the result of multiplication of scaling factor and fraction would be very low even for higher values of t_n (say, t_n = 0.8). Consider the following hypothetical example.

Assuming government contingent liability (or AAL) for insurance purposes for a given year is $10 million, as against a total budget of say, $100 million. Using these figures, the fraction will yield 0.1 as outcome. Considering a scaling factor of the value of say, 0.8 (valued between 0 and 1, as defined in the concept note), the product of the fraction and scaling factor will be 0.08, which according to the proposed formula will be the externally supported premium share (P_e). As P_e (0.08) is a proportion of P_a i.e., 8% of P_a, the value of country premium share (P_p) would be 0.92 (1 – 0.08), or in other words, 92% of the premium is to be paid by the country. Considering a higher fraction, say 0.4 (which is a rarity, even for the least developed countries) and a scaling factor of 0.9 will result in 0.36 as P_e i.e., 64% of premium share for countries (P_a).

Possible solution: The example explained above is contrary to the real-world application of and evidence on premium subsidies. For example, donors have provided support for 84 – 100% share of the premiums for low-income countries for policies purchased under PCRAFI (see, World Bank 2017). Considering the above example, it is therefore not be feasible to have an upper bound for the scaling factor. Alternatively, a constant (k) with predefined value may be added into the formula. The value of 'k' may also be fixed beforehand for different country groups like for least developed countries (LDCs), V20 countries, small island developing states (SIDS), among other.

4. Defining the value of the scaling factor for macro-level PCS

As highlighted earlier, this guidance document uses a multi-criteria decision model (see footnote 1) to define the scaling factor and it builds on the performance-based allocation systems (PBA) used to allocate financial resources by multilateral development institutions and funds. This approach could also be used (with necessary modifications) to directly determine the 'allocation share' out of a fixed donor fund among recipient countries.

In this section, conceptual guidance and evidence on PCS allocation is revisited. Since the suggested approach builds on the performance-based systems operational at the global

level, a review of such allocation mechanisms is also presented to contextualise the choices of factors and indicators as well as the calculation method suggested later in this section.

4.1 Existing evidence on provisioning for PCS at macro-level

4.1.1 Considerations for 'sizing' the macro-level PCS interventions

The SMART PCS Principles suggest that both needs-based and performance-based considerations should inform the PCS sizing decisions. Subsidies should not be provided universally to all countries and income should not be the only criteria[16] in deciding their size, rather eligibility of countries (and size of premium support) should be evaluated based on country's (climate and disaster) risk profile and government's 'ability to pay' and 'willingness to pay' for insurance[17] (Vivid Economics et al., 2016; Panda et al., 2021c). For instance, IDA eligibility could serve as proxy for countries with lack of ability to pay[18] and specific risk metrics that account for both physical and social vulnerability could be used to approximate climate and disaster risk of a country. Therefore, higher premium support should be provided to countries that are poor (with weak fiscal position) and have the most vulnerable (at risk) populations (Principle 'S').

These considerations are consistent with the conceptual guidance provided by Panda et al. (2021a; 2021b; 2021c) and Vivid Economics et al. (2016). For instance, Panda et al., (2021c) provides insights into three main considerations for appropriately sizing PCS: (i) needs-based considerations for target countries, (ii) optimal level of insurance protection, and (iii) sustainability of the supported scheme. The needs-based considerations include higher allocation of premium support for low-income countries as they typically have limited fiscal space (and debt accessibility constraints) to cover premium costs, compared to higher income countries. Further, countries that are exposed to risk of low frequency but high impact events, though it may not be strongly reflected in their AAL, will still have a larger share of output/capital or population at risk than countries whose risk profile is dominated by higher frequency/lower impact events, and should get higher premium support. The optimality consideration requires identifying optimal level of insurance for a country[19] and argues for higher support from donors to under-insured countries to help them achieve their optimal level of insurance protection. In addition, the sustainability of the supported

[16] Despite being a critical factor in in determining the size of PCS, country's income level only reflects an annual status and therefore is not a forward looking metric that accounts for increased climate risks to a country, for example.

[17] Panda et al., (2021c) provides a detailed discussion on eligibility of countries to receive premium support based on their ability and willingness to pay for insurance (see page 8).

[18] With a fixed availability of PCS, further prioritisation might be required in the IDA eligible countries as well. There might also be situations where premium support to non-IDA (IBRD countries) would be justified (see Principle 'S' in Töpper and Stadtmüller, 2022).

[19] Although, it is difficult to estimate optimal level of insurance for country as it requires information on various benchmarks for example, suitability and adequacy of insurance, government preferences over debt and growth outcomes, among others. See Cebotari and Youssef (2020) for a detailed discussion on optimality of insurance for sovereigns.

insurance scheme is an important consideration as the premium support should make the scheme viable and not disincentivise other risk reduction measures (ibid).

As suggested in the SMART PCS concept note, policy performance of the government in proactive disaster risk management (and risk financing) should be considered as an important criterion in addition to the needs-based consideration to decide the size of PCS interventions. Principle 'A' (accessibility) suggests that higher premium support should be provided to countries that show strong political commitment and create an enabling policy environment for greater CDRFI uptake. As highlighted in Panda et al. (2021c), performance indicators that might be used for defining the scaling factor could include (i) improvements in financial protection status of the country, (ii) investment in adaptation and improvement in disaster preparedness and resilience. Novel indices constructed for measuring performance could be used for this purpose (ibid).

According to the Policy Note, the needs-based considerations are "reasonably" accounted for in the suggested 'fraction' (see page 16) while performance indicators[20] could be used to define the scaling factor. However, several important need-based factors that could influence the demand of PCS (e.g., per capita income, debt stress, vulnerable population, among others) are not accounted for in the suggested fraction. Therefore, even for defining the scaling factor, it is important to explore such factors in addition to the performance indicators. This approach is consistent with multiple global resource allocations mechanisms (discussed in the next section) where needs-based and performance-based criteria are collectively used to allocate resources.

4.1.2 PCS allocations and resource allocation methodologies at global scale

Historically, *ad hoc* provisions have been made for targeting and allocating premium subsidies, for example, based on perceived needs of the countries and/or political and historical ties between donors and recipients[21] (Vivid Economics et al., 2016; World Bank 2017; Panda et al., 2021c). Although, the SMART PCS concept note provides conceptual guidance on allocation of PCS (in principle 'A' and 'S'), there is limited evidence on empirical methods of appropriately allocating premium support to recipient countries. This could be partly because using PCS for CDRFI is a relatively new and evolving field that requires development and refinement of operational guidelines based on increasing evidence (Panda et al., 2021a; 2021b). However, appropriately allocating 'fixed' financial resources among

[20] Although, the suggested performance indicators are relevant for this purpose, some of them may already be accounted for in the fraction (and might be pulling scaling factor and/or external premium share in different directions). For example, investment in adaptation and disaster preparedness should reduce the expected government contingent liabilities (the numerator of the fraction).

[21] For example, in the Africa Disaster Risk Financing Programme (ADRiFi) a country will receive up to 50% of its annual premium as subsidy until the fourth year of country's participation. Similarly, a direct capital support of $98 million as a 20-year non-interest-bearing loan was provided to ARC Limited by the UK Department of International Development and KfW (Panda et al., 2021c). The extent to which these ad hoc provisions have aligned with the SMART principles have been reviewed in evaluations of individual schemes, for example, recent evaluation of ADRiFi (not published).

recipient countries to achieve maximum impact has always been a complex optimisation problem for donors and multilateral financial institutions (Kharas and Noe, 2018).

Aid allocation mechanisms, mostly used by multilateral development banks (MBDs), could serve as a benchmark for developing an appropriate method to define the size of PCS (and the scaling factor). Performance-based allocation (PBA) systems are widely used to allocate development funds. The World Bank has been using it since 1977 to allocate IDA resources and almost all major multilateral development institutions have adopted a PBA system over the past two decades (GEF 2017). Annex 1 provides summary of key allocation mechanisms relevant for the purpose of identifying and weighing indicators to define the scaling factor.

Table 1: Formulae in major performance-based allocation systems

Multilateral Development Institution, Fund	Needs Factors		Performance Factors	Result
Global Environment Facility, GEF Trust Fund	$\mathrm{GBI}^{0.8} * \left(\frac{\mathrm{GDP}}{\mathrm{capita}}\right)^{-0.08}$	X	$(0.65\mathrm{CEPIA} + 0.15\mathrm{CPIA_D} + 0.2\mathrm{Portfolio})$	= allocation share
African Development Bank, African Development Fund	$\mathrm{Population}^{1} * \left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-0.125} * AIDI^{-0.125}$	X	$(0.26\mathrm{CPIA_{A-C}} + 0.58\mathrm{CPIA_D} + 0.16\mathrm{Portfolio})^{4}$	= allocation share
Asian Development Bank, Asian Development Fund	$\mathrm{Population}^{0.6} * \left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-0.25}$	X	$[(\mathrm{ADB\_CPIA}_{A-C})^{0.7} * (\mathrm{ADB\_CPIA_D}) * \mathrm{Portfolio}^{0.3}]^{2}$	= allocation share
Caribbean Development Bank, Special Development Fund	$\mathrm{LogPopulation} * \mathrm{POOR}^{0.1} * \left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-0.9} * \mathrm{Vulnerability}^{2}$	X	$(0.7\mathrm{CDB\_CPIA} + 0.3\mathrm{Portfolio})^{2}$	= allocation share
International Fund for Agricultural Development	$\mathrm{Rural\_Population}^{0.45} * \left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-0.25}$	X	$(0.2\mathrm{CPIA} + 0.35\mathrm{Portfolio} + 0.45\mathrm{RuralCPIA})^{2}$	= allocation share
Inter-American Development Bank, Fund for Special Operations (half of the fund allocated by each formulae)	$\mathrm{Population}^{0.5} * \left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-0.25}$	X	$(0.3\mathrm{Portfolio} + 0.7\mathrm{CIPE})^{2}$	= allocation share
	$0.22\mathrm{FUND} * \left(\frac{\mathrm{Population}}{\sum \mathrm{Population}}\right) + 0.133\mathrm{FUND} * \left[\frac{\left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-1}}{\sum\left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-1}}\right]$	+	$(0.6\mathrm{FUND}) * \left[\frac{0.7\mathrm{CIPE} + 0.3\mathrm{Portfolio}}{\sum(0.7\mathrm{CIPE} + 0.3\mathrm{Portfolio})}\right]$	= $ allocation
World Bank, IDA	$\mathrm{Population}^{1} * \left(\frac{\mathrm{GNI}}{\mathrm{capita}}\right)^{-0.125}$	X	$(0.24\mathrm{CPIA_{A-C}} + 0.68\mathrm{CPIA_D} + 0.08\mathrm{Portfolio})^{3}$	= allocation share

Note: GBI = GEF's Benefits Index; CEPIA = Country Environmental Policy and Institutional Assessment; CPIA = Country Policy and Institutional Assessment; AIDI = African Infrastructure Development Index; CIPE = Country Institutional and Policy Evaluation
Source: GEF (2017)

PBA systems typically involves multi-criteria decision models (MCDM). Table 1 presents the formulas used in major PBA systems at a global scale[22]. Allocations in a PBA system are

[22] Table 1 is adopted from GEF's evaluation of STAR (GEF 2017).

generally determined by two components: (i) country needs and (ii) policy performance and institutional capacity. The needs-based component generally includes indicators like income (e.g., GNI per capita) and population to assess the socio-economic conditions that prevail in a country. The second component measures the policy performance and institutional capacities in the country to make best use of allocated resources. Income and population, as key determinants of country needs, dominate most of the PBA systems. However, multi-dimensional vulnerability metrics[23] are increasingly finding a place in such allocation systems, especially after the COVID19 pandemic where many high-income countries (e.g., SIDS) found it difficult to recover from the pandemic without external support (see UN-DESA 2022).

The focus of most of the allocation methods has been on including factors that are readily quantifiable and available at global scale. As in Table 1, all PBA systems use a multiplicative formula where all the factors that constitute the formula are critical and cannot have zero value (to avoid zero sum). On the contrary, in an additive formula, zero value for one factor will not result in a zero sum. Such additive formulae are seldom used in multilateral development aid allocations (GEF 2017). One of the potential reasons for this is because the additive methods are more sensitive to the decisions on weights.

It is important to note that PBA systems also suffer from a limitation of allocating 'appropriate' funding to a large set of countries i.e., at a global scale. It is typically the case that some countries receive a much lower allocation than expected allocation *inter alia* due to choices of indicators, weights and calculation method. Therefore, to increase their robustness, they are often operationalised for a group of countries and/or selected after setting some minimum eligibility criteria. The GEF's STAR allocation and IDA, among others have minimum eligibility criteria for countries to receive funding (see Annex 1 for details).

4.2 Selection of factors and indicators

Building on the discussion presented in the foregoing sections, the following set of factors are suggested along with relevant indicators to define the value of the scaling factor (and/or allocation share). Following the guidance from the SMART PCS concept note and PBA systems of resource allocation, these factors are placed under two main components – (1) needs-based component and (2) performance-based component.

The selection of factors and indicators is also guided by the consultation with key stakeholders and AWG members. Table 2 presents a summary of stakeholder responses (during KIIs for the PEA), recorded when asked about their most preferred choices[24] of the

[23] See for example, UNDP's multi-dimensional vulnerability index for SIDS here.

[24] Respondents were asked to pick three of their most preferred choices with justification out of list of key factors (identified based on AWG discussion and literature review) that must be used to determine the size of PCS allocations. (see Scott et al., 2022 for more information on the political economy analysis of premium and capital support).

factors that could influence PCS allocations and should be part of the analysis to determine size of premium support.

Note: The indicators suggested in this guidance document are quantifiable and readily available for most countries. The list of factors (and indicators) suggested below is not exhaustive and could include additional indicators suitable to be considered under either of the two components. This means that indicators based on qualitative criteria, with no readily available value, could also be included along with (or potentially instead of) the suggested quantitative indicators. However, inclusion of such indicators would have implications on the underlying method suggested in this guidance document. Considerations for inclusion and treatment of such qualitative criteria are discussed in Annex 2.

Table 2: Stakeholders' preferred choices (during KIIs for political economy analysis) of factors to determine size of PCS allocation

Rank*	Factors determining PCS allocation size	factor choice by % of respondents
1	Proportion of vulnerable population in total population	73%
1	Climate and disaster risk profile	73%
2	Country income level	60%
3	Prior risk reduction actions/policy of a country	53%
4	Country debt accessibility constraints	27%
5	Level of insurance penetration	13%
6	Others - country size, economy size, etc.	7%

*Ranked by proportion of choices by respondents. Respondents were asked to pick three of their most preferred choices. There was a total of 15 KIIs.

4.2.1 Needs-based component

Income-level of a country

In line with Principle 'S' (sustainable impact), allocation of premium support should differentiate between countries' ability to pay as such, PCS should be provided to countries with 'weak fiscal positions' (criteria A1 in GRiF 2019; World Bank 2017; Panda et al., 2021c). Therefore, a higher allocation should be given to low-income countries as they have limited "scope of trade-off between economic growth and the impact of insurance-related expenses on fiscal positions" (see discussion on 'needs-based consideration' in Panda et al., 2021c).

As with several global allocation mechanisms, 'GNI per capita' can be used as a measure of countries' financial need (and by extension, its demand for PCS). This measure is also the basis for World Bank's income-based country classification. Some evidence (e.g., ARC 2021) also suggest that 'GDP per capita' can be used as a measure of financial needs of a country. However, in comparison with GNI per capita[25] (which is a more comprehensive measure of

[25] The GNI per capita indicators suggested here is in current US dollars. During consultations, some experts suggested using GNI per capita in PPP terms to account for differences in living standards across countries.

the income received by residents of a country), GDP per capita is rarely preferred by multilateral development institutions in allocating resources[26] (see Table 1 in Section 4.1).

Debt accessibility constraints/Debt status

In addition to the economic criteria, captured under the 'income-level of a country' indicator, a country's ability to diversify risks across time through issuing debt (to meet the initial costs of a disaster which can then be repaid over time) should be considered as key factor for determining level of premium support (see Principle 'S' and World Bank 2017; Panda et al., 2021c). Therefore, debt accessibility constraint and/or debt stress levels for a country would help in determining its lack of ability to pay for insurance and need for higher levels of PCS.

The Policy Note and Panda et al (2021c) suggest using World Bank-IMF Debt Sustainability Framework for Low-Income Countries (LIC-DSF)[27] list to determine countries debt status and the risks of debt stress for a country. The framework's Highly Indebted Poor Countries (HIPC) status could also be utilised to approximate debt stress levels.

Poor (vulnerable) population

PCS allocations should be prioritised for countries with a higher number of poor and vulnerable people (see Principle 'S' and IGP's pro-poor principles). Poor people are disproportionately affected by climate change and disasters (Hallegatte 2020). Donors, in general, would want to focus on utility-maximising allocation to countries with larger proportion of poor and at-risk people where an extra unit of allocation would make the biggest difference to their wellbeing (see Ward et al., 2022 for 'value for money' assessment of PCS).

World Bank's 'Poverty headcount ratio'[28] can be a readily available proxy for poor[29] and vulnerable population in a country, which is typically measured as a proportion of total population. Alternatively, IGP's 'vulnerable populations' indicator can be used, where "people vulnerable to slipping into poverty as a result of climate risks are defined as those who earn less than $15 PPP/day" (see IGP's M&E Framework, page 9). The IGP indicator includes 'at-risk' population in addition to the poor population as defined by the World Bank's headcount ratio.

Climate (and disaster) risk

As with Principle 'S' and 'A', the levels of PCS should be climate (and disaster) risk-adjusted, i.e., higher premium support should be provided to countries at higher risks of climate stress. This would recognise that current and future insurance premiums might be higher in

[26] This could be because GDP is a measure of the economic activity taking place in a country but not the income received by residents. For example, if a large MNC has lots of extractive activity in a country in global South but most of its dividends and salaries go to people living in the global North then the GDP value would be higher than the GNI numbers.
[27] See IMF (2018) for more details on LIC-DSF.
[28] According to the World Bank, poverty headcount ratio at $1.90 a day is the percentage of population living on less than $1.90 a day (in 2011 PPP).
[29] Poverty is considered as unidimensional here, based on income only.

such countries due to increasing frequency and intensity of climate-related fast-onset disasters, and therefore they would require higher premium support[30] (Panda et al, 2021c).

Suitable global indices on climate and disaster risk can be used to approximate country's risks (hazard exposure and vulnerability)[31]. The ND-GAIN country index can be suitable for this purpose as it summarises country's exposure and sensitivity to climate risks (and geophysical disasters) using a comprehensive set of criteria[32]. Other global indices can also be considered such as the Global Climate Risk Index[33], the INFORM Risk Index[34], the Verisk Climate Change Vulnerability Index[35] and the Climate Vulnerability Monitor[36].

4.2.2 Performance-based component

Country's resilience to disaster and climate risks

Along the lines of baseline resilience/ past policy action signalling readiness for further improvements (spurred by PCS) in future, country's resilience to climate (and disaster) risks, typically measured in terms of its ability to cope with climate risks, should be considered as an important determinant of PCS size (see Principle 'A'; World Bank 2017). This consideration will help promote the resilience-building incentives of PCS (see Principle 'R'). Further, it could assist in monitoring and evaluation of PCS allocations from time to time to observe progress in furthering the disaster risk financing and management actions of a country[37].

Performance indices that reflect country's resilience to climate risks could be used to approximate this factor. Since a (climate) risk index is already suggested as part of the need-based criteria above (see climate risk factor), use of the same index for this criterion would help promote consistency and comparability ensuring, for instance, that data is available for the same countries and is likely to refer to country performance at the same point in time. As before, the 'readiness index'[38], part of the ND-GAIN country risk index could be a suitable choice. Other similar indices like INFORM risk index or Climate Risk Index, among others may also be considered. However, they do not provide specific measure/index for resilience but some related indices like 'coping capacity' may be considered.

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[30] Climate change attribution science could provide a potential alternative to decide the size of premium support. See Annex 3 for more details.

[31] Important to note here is that the 'fraction' in the suggested formula for PCS sizing already accounts for countries (financial) vulnerability to climate risks through the level of contingent liability (or AAL). However, in light of the Principle 'S', some experts argued that it is necessary to consider such 'physical vulnerability' measure as a key determinant of PCS size.

[32] ND-GAIN index: https://gain.nd.edu/our-work/country-index/rankings/

[33] The Global Risk Index, GermanWatch: https://www.germanwatch.org/en/cri

[34] The INFORM Risk Index, DRMKC: https://drmkc.jrc.ec.europa.eu/inform-index

[35] Verisk Climate Change Vulnerability: https://www.maplecroft.com/risk-indices/climate-change-vulnerability-index/

[36] The Climate Vulnerability Monitor, CVF: https://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012/monitor/

[37] This factor could also be (partly) captured by the fraction in the suggested formula if DRM-related component of the government budget is used as denominator instead of the total government budget. In line with the discussion in Section 3 (bullet c), increase in DRM-related budget over time would reflect (in financial terms) country's progress in prioritising disaster risk management.

[38] ND-GAIN's readiness index "measures a country's ability to leverage investments and convert them to adaptation actions. ND-GAIN measures overall readiness by considering three components – economic readiness, governance readiness and social readiness." See ND-GAIN's Technical Document for more details.

Country's policy performance and institutional effectiveness

Principle 'A' (accessibility) suggests that "higher premium support should be provided to countries that show strong political commitment and create an enabling policy environment for greater CDRFI uptake". While this is partly captured by the country resilience indicator discussed above (which captures policy commitment specifically to CDRFI), it is suggested to also include country's overall policy performance and institutional effectiveness to account for effectiveness of its economic management and structural policies, human development and social inclusion policies and institutional capacity to carry out macro-level policy changes.

The World Bank's Country Policy and Institutional Assessment (CPIA) index could be used to assess quality[39] of each country's political and institutional framework. There are 16 criteria defined for CPIA which are grouped into four clusters of equal weights (see Annex 1 for details). The index was developed to aid IDA allocations and is currently being used by several multilateral development institutions for allocating resources. Some of the institutions have also used a harmonised/modified version of CPIA (see for example, GEF's STAR in Annex 1) to make it specific for their context, although, in this context, there is not a version of CPIA that focuses specifically on issues related to disaster risk management or disaster risk finance.

4.3 Weighing indicators and calculating results

Assigning appropriate weights to different indicators is a critical next step to account for allocation priorities outlined in the SMART PCS principles. However, it is a difficult task for the donors/practitioners to quantitatively reflect such priorities in the calculations. Therefore, to factor in PCS priorities/principles in the suggested indicators, several simulations would have to be performed to obtain suitable weights[40]. In this regard, weights used in PBA systems operational at global level could guide practitioners. Table 3 presents a summary of existing guidance (range) on weighing the suggested indicators.

[39] As per CPIA criteria, "quality" refers to how conducive policy and institutional framework is in fostering poverty reduction, sustainable growth and effective use of development assistance (see CPIA criteria 2017).

[40] For example, some small island developing states (SIDS) might not get an appropriate allocation share *inter alia* due to their higher (per capita) income status. However, the guidance note includes multiple vulnerability and performance indicators that could compensate for the income dimension in case of SIDS. This would require a careful calibration of weights for the suggested indicators.

Table 3: Suggested weighing range for further calibration (based on performance-based systems used by multilateral development institutions)

Factor	**Suggested indicator/proxy**	**Suggested range of weights as exponent (for simulations)**	**Rationale/priorities**
Needs-based component			
Income-level of a country	GNI per capita	- 0.08 to - 0.25	Level of income is inversely linked to allocation size to provide for higher allocation to lower income countries
Debt accessibility/debt stress levels	Debt stress risk/ranking (World Bank-IMF's DSF) or other suitable metric	No guidance available[41] Suggested: 0.1 - 1	Higher allocation for countries with high debt stress/accessibility constraints
Poor (vulnerable) population	World Bank's poverty headcount ratio, or IGP's vulnerable population criteria	Guidance used for population/rural population in PBA systems (see Table 1) Suggested: 0.1 – 1	Higher allocation for countries with larger proportion of poor (and vulnerable) population
Climate and disaster risk (hazard exposure)	ND-GAIN index, or hazard exposure score from other similar indices	0.1 – 2	Higher allocation to countries that have higher vulnerability to climate risks
Performance-based component			
Climate and disaster resilience	ND-GAIN readiness index, or resilience score from other similar indices	No guidance available Suggested: 0.1 - 2	Higher allocation to countries that show progress in resilience-building
Policy performance and institutional effectiveness	World Bank' CPIA	For combined[42] CPIA score: 2 – 4	Higher allocation to countries that have effective policy performance and institutional capacity

Although guidance from the existing PBA systems could help, weights for the indicators should ideally be assigned using a participatory approach. For this, consultative processes such as workshops, focus group discussions and key informant interviews could be helpful.

To bring it all together and calculate the result, two options may be considered.

(A) Multiplicative approach - used by most PBA systems

$$t_n\ (or\ t_n\ score) = [Needs\ based\ component]\ \text{X}\ [Performance\ based\ component]$$

$$\text{i.e.,}\ \ t_n\ (or\ t_n\ score) = [(x)_1^{w1} * (x)_2^{w2} * (x)_3^{w3} * (x)_4^{w4}]\ \text{X}\ [(y)_1^{w5} * (y)_2^{w6}]$$

[41] No guidance on weighing range available from PBA systems reviewed under Section 4.1.2. The suggested range is based on expert judgement considering the rationale/priorities relevant for an indicator. This also accounts for the nature of underlying data. For example, to increase the value of an indicator which has a value more than 0 and less than 1 (for example, the poverty headcount ratio), an exponent weight between 0.1 and 0.99 should be tried as the value of that indicator will increase when weight moves downwards from 0.99 to 0.1, and vice-versa.

[42] In some cases, $CPIA_{A-C}$ and $CPIA_D$ are used separately with different weights (see Table 1).

(B) Additive approach – less used in practice

$$t_n\ (or\ t_n\ score) = [Needs\ based\ component] + [Performance\ based\ component]$$

$$\text{i.e.,}\ \ t_n\ (or\ t_n\ score) = [(x)_1^{w1} * (x)_2^{w2} * (x)_3^{w3} * (x)_4^{w4}] + [(y)_1^{w5} * (y)_2^{w6}]$$

Please note that other modes to represent weights as exponents may also be used. For example, a combined weight may be assigned to the performance-based component. Similarly, in the additive approach, weights can be added within each component (e.g., $[(x_1*w_1) +(x_2*w_2) + (x_3*w_3)] + [(y_1*w_5) + (y_2*w_6)]$).

<u>Note:</u> As discussed in section 2 and section 4, the suggested approach could also be used to calculate the proportion of funding that a country receives from a donor fund. This would require the following additional steps[43]:

(i) calculating country share by dividing individual country score by the sum of all country scores, and
(ii) calculating the country allocation share by multiplying the country share by the funds to be allocated.

4.4 Additional considerations

4.4.1 Setting upper and lower limits for premium subsidies

All PBA systems prevalent at the global scale have some operational limitations and therefore it is not possible to calculate 'optimum' levels of allocations for all the countries (see Section 4.1.2). This would most likely be true for the suggested method in this guidance document as well. There could be a scenario where the calculated premium support allocation might not be adequate (for example, at very low level for any donor support to come in – say, less than 10%) for a particular country or group of countries. It is therefore advised to consider setting pre-defined minimum and maximum limits for premium support. These limits could also be pre-defined for different country groups (see for example, floor and ceiling in STAR allocation method in Annex 1).

4.4.2 Duration of premium support

Long-term sustainability of the insurance schemes for which premium support is provided is a key objective as well as a concern for donors. As with the Policy Note (page 12), "PCS may be considered for as long as climate-fuelled impacts accelerate and it generates substantive quantified resilience benefits". However, from a sustainability perspective it is likely to be valuable for at least some recipient countries to gradually assume more responsibility for the premium payments through defining a clear strategy for reducing or removing subsidy support over time, although this needs to be judged carefully and in the context of each country's context. To facilitate this judgement, the initial duration of premium support should be decided in advance. This will support medium-term budgetary planning and help

[43] The approach is similar to the STAR allocation method of the GEF (see Annex 1)

build political support for CDRFI solution. It should then be (re)evaluated at regular intervals (e.g., in short, medium and long-term)[44], based on predefined criteria[45].

On the (initial) duration of premium support at macro-level, Principle 'S' suggests:

> *"Where premium support is deemed appropriate, it should wherever possible be provided on a multi-year basis. Since financial planning timeframes of recipient countries often have terms of 3 – 5 years, multi-year (3y+) commitments should be the default in order to promote longer-term certainty. After this initial support period, PCS needs and effectiveness should be re-evaluated in regular intervals, which can be of adequate length, varying from single- to multi-year periods*."

Panda et al. (2021c) suggested that low-income countries (lacking ability to pay) and small island states (with small market size and high vulnerability) should be eligible for premium support in the short-term (1 to 4 years). Further eligibility of such countries in the medium and long-term should be based on the evaluation of their needs and progress made over the period of premium support (ibid).

Based on the analysis of existing evidence and discussion with experts (during KIIs and other consultations), it is suggested to define a 'minimum lock-in period' for premium support, during which subsidy amount should remain fixed. After this minimum lock-in period, subsidies may be reduced in a pre-defined manner on an annual basis (for example, reducing between 10 – 25% per annum). In line with the guidance in SMART PCS principles (Principle 'S') and Panda et al. (2021c, page 14), the minimum lock-in periods may be defined for different country categories.

Some experts (during KIIs) argued that premium support to low-income countries should be provided for at least 3 years without change so as to make the country realise the benefits of having climate risk insurance in place. Another argument was to continue premium support until the first pay-out happens for a country. This would help the government to realise the benefits of having an insurance mechanism in place and likely to increase its uptake.

[44] Panda et al. (2021c) defines short-term as 1 to 4 years, medium term as 4 to 8 years and long term as 8 to 11 years.

[45] The performance-based criteria suggested in this guidance document could be used to evaluate allocation decisions after specified intervals. In addition, value for money assessment of such interventions could be useful yardstick (see Ward et al., 2022). For discussion on time span of premium support, see Panda et al. (2021c, page 14) and in World Bank (2017, page 29).

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Annex 1: Selected resource allocations mechanisms at global scale

a) International development association (IDA)

IDA is a lending mechanism of the World Bank which was established in 1960 to complement the operations of the International Bank for Reconstruction and Development (IBRD). The aim of IDA is "to reduce poverty by providing zero to low-interest loans (called "credits") and grants for programs that boost economic growth, reduce inequalities, and improve people's living conditions."[46] IDA supports 74 of the world's poorest countries with funding assistance on concessional terms, usually with repayments terms of over 30 years. Typically, low-income countries that are at risk of high debt distress receive all or half of their IDA assistance in form of grants with no repayment terms. In addition, IDA also provides debt relief to countries.

Contributions to the IDA largely comes from its member countries. The resource replenishment and related policy guidance is reviewed by donors every three years. In the most recent replenishment of IDA resources in December 2021, a historical $93 billion financing package was approved for the period 2022-2025. Annual commitments to IDA have increased in recent years amounting to an average of $29.4 billion during FY2019-FY2021.

Performance-based allocation method

The first step in allocating IDA is identifying eligible countries. Country's eligibility for IDA is decided based on its relative poverty and lack of creditworthiness to access finance. GNI per capita below an established threshold is used to approximate country's relative poverty. The threshold is $1255 for FY2023, and it is updated annually.

Considering that IDA resources are fixed, the allocation of scarce resources among eligible countries is done based on country's policy performance and institutional capacity to ensure that allocated resources are best utilised in reducing poverty. This performance-based allocation is done using Country Policy and Institutional Assessment (CPIA). For IDA allocation purposes, CPIA is also referred to as the IDA Resource Allocation Index (IRAI). Another rating that is used to determine IDA allocation is the Portfolio Performance Rating (PPR). Both these rating systems are described below.

Country Policy and Institutional Assessment: This index is used to assess quality of each country's political and institutional framework. There are 16 criteria defined for CPIA which are grouped into four clusters of equal weights. Country teams propose ratings for each of the following criteria with written justifications. Details of the rating criteria are provided in the CPIA questionnaire (see CPIA criteria 2017).

A. Economic Management
1. Monetary and Exchange Rate Policies
2. Fiscal Policy
3. Debt Policy and Management

B. Structural Policies
4. Trade

[46] World Bank – IDA (https://ida.worldbank.org/en/what-is-ida)

5. Financial Sector
6. Business Regulatory Environment

C. Policies for Social Inclusion/Equity

7. Gender Equality
8. Equity of Public Resource Use
9. Building Human Resources
10. Social Protection and Labour
11. Policies and Institutions for Environmental Sustainability

D. Public Sector Management and Institutions

12. Property Rights and Rule-based Governance
13. Quality of Budgetary and Financial Management
14. Efficiency of Revenue Mobilization
15. Quality of Public Administration
16. Transparency, Accountability, and Corruption in the Public Sector

Portfolio Performance Rating: This rating refers to the financial health of IDA portfolio, which is measured by the percentage of problem projects in each of the IDA countries. Therefore, it captures quality of management of IDA's projects and programmes.

Using the CPIA and PPR, the IDA *Country Performance Rating (CPR)* is developed. CPR of IDA are determined annually.

$$\textit{Country Performance Rating (CPR)} = (0.24*CPIA_{A\text{-}C} + 0.68*CPIA_{D} + 0.08*PPR)$$

Here, $CPIA_{A\text{-}C}$ represent the average rating for cluster A to C, and $CPIA_{D}$ represent rating for cluster D from the CPIA criteria.

Performance-based allocation formula for IDA is presented below. In the formula, CPR has an exponent of 3 and it is the main determinant of the allocation. Population size has an exponent of 1 (as it affects allocations positively). GNI per capita is negatively related to allocations and has an exponent of -0.125.

$$\textit{IDA country allocation} = f\,(CPR^{3}, \textit{population}, \textit{GNI per capita}^{-0.125})$$

IDA also provides additional resources to countries through some dedicated windows, which are described in detail in the Annexures of the IDA19 Replenishment Report (IDA 2020). Further, there are specific exemptions to the above discussed performance-based allocation method, for example the small island exemption, allowing small island economies with population less than 1.5 million to receive IDA, despite being high-income country. Such exemptions are also discussed in detail in the IDA19 Replenishment Report (Annex 2).

b) Global environment facility (GEF) – STAR allocation method

GEF funds country-specific initiatives for biodiversity protection, climate change response, pollution reduction and nature restoration in developing countries. It works closely with environmental financiers and connects 184 member countries with a network of civil society, indigenous people, and the private sector. Since its inception in 1991, it has provided more than $22 billions of funding through grants and blended finance and

mobilised more than $120 billion for national and regional projects and programmes across the globe.

GEF uses the System for Transparent Allocation of Resources (STAR) to allocated resources to its eligible countries. STAR replaced the Resource Allocation Framework (RAF), the former resource allocation system of GEF during the fifth replenishment period of the GEF (GEF-5). STAR is a performance-based allocation system that aims "to allocate resources to countries in a transparent and consistent manner based on global environmental priorities and country capacity, policies and practices relevant to successful implementation of GEF projects and programs" (GEF 2018)

STAR allocation method

STAR allocation method is applicable to countries which satisfy the eligibility conditions to receive funding from GEF trust fund[47]. STAR consists of the following three indices and sub-indices.

Global Benefits Index (GBI): GBI is a measure of GEF's investment benefits in a country pertaining to a specific focal area. There are three focal areas in STAR – (i) biodiversity (GBIBD), (ii) climate change (GBICC), and (iii) land degradation (GBILD). For a specific focal area, GBI represent a country's relative share of GEF potential benefits that can be generated with a fixed resource input in that focal area. A higher GBI means higher potential benefits generated.
GBIBD is a weighted score of country's terrestrial (0.75) and marine (0.25) biodiversity. GBICC is weighted score of two sub-indices – GHG emissions (0.95) and forest cover and change in forest cover (00.05). GBILD constitute of global share of land area affected (0.2), proportion of dryland area (0.6) and proportion of rural population (0.2).

Country performance index (CPI): GEF CPI or GPI measures a country's relative performance and capacity to deliver on the potential global environmental benefits. It is considered the same for all focal areas in a country and calculated based country's current and past performance in project development and implementation, along with effectiveness of its policy and institutional frameworks. CPI works as a counterbalance measure for GBI. CPI is calculated using two main sources – CPIA index developed by the World Bank and GEF portfolio performance index.

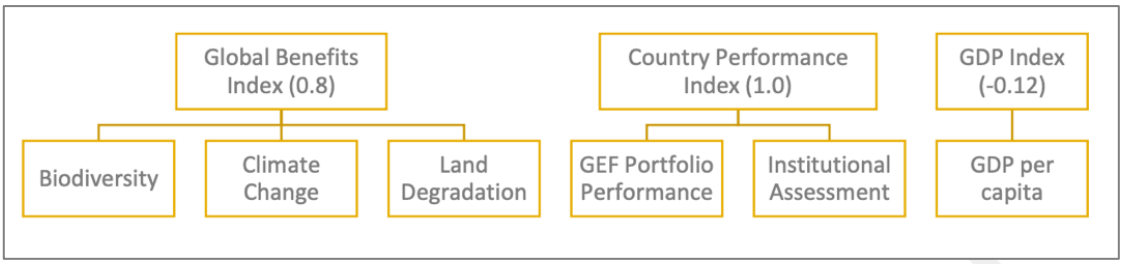
GDP index: This is designed to benefit countries with low-per capita income as it is used to decrease the allocation to countries with high per capita income.

Floors (minimum allocation) limit is also set for respective focal areas differentiating between least developed countries (LDCs) and non-LDCs. Ceiling (maximum allocation) is set at 10% of the total focal area allocations for each of the focal areas (for GEF-7). Details on the floor and ceiling limits are provided in GEF (2018), page 7.

[47] To be eligible for GEF funding, a country should (i) be a Party to the relevant Convention and meet the eligibility criteria decided by the Conference of the Parties to that Convention; (ii) not be member of the European Union; and (iii) have had at least one national project in the past five years, excluding projects that involve reporting to the Conventions (refer to point 5, GEF 2018).

Weights for three STAR indices: The weights to STAR indices are provided as exponents. GBI has an exponent of 0.8, CPI is given an exponent of 1 and GDP index has an exponent of -0.12[48] in the GEF-7 period.

Figure 1a: STAR indices and sub-indices (as in GEF-7)



Source: GEF (2018)

Based on the values of abovementioned indices for each country, following steps are followed to calculated country allocations as per the GEF-7 guidelines (refer to GEF 2018)

- Country score is calculated using the following formula:

$$Country\ score = GBI^{0.8} * CPI^{1.0} * GDP\ index^{-0.12}$$

- Based on country score, country share is calculated as follows:

Country share = Country score/Sum of country scores for all STAR recipient countries

- Preliminary STAR country allocation a focal area is calculated as:

*Preliminary allocation = Country share * STAR resources*

- Finally, preliminary STAR country allocations are adjusted for floors and ceilings for each focal area

Currently a review of the GEF-7 STAR policy guidelines is underway as part of the GEF-8 replenishment review. More details can be accessed from here.

c) Global risk financing facility (GRiF) – Appraisal framework for grant support

GRiF functions as a multi-donor trust fund, established in 2018 with pledges of over $200 million from German and United Kingdom to help vulnerable countries develop and implement disaster and climate risk financing solutions. The facility provides finance and technical expertise to countries to develop innovative financial instruments while supporting to grow the existing ones. Financial solutions are typically designed as part of the World Bank projects across different sectors.

GRiF uses a set of principles and appraisal framework to use grant financing under the MDTF (see GRiF 2019). The guidelines and appraisal framework help in making resource allocations

[48] GEF-8 review has recommended to change the weight for GDP index to -0.16 (see revised recommendations here).

at the portfolio level and appraise proposals at product/project level. This helps in appraisal of decisions related to (but not limited to) providing start-up and operating costs, capitalisation of risk financing vehicles, cost of financial instrument and cost of linking ex-ante funding with national delivery mechanisms.

At portfolio level, donors are expected to agree on prioritised countries, mainly based on the level of economic development and vulnerability to disaster and climate shocks. The GRiF appraisal method recommends prioritising IDA countries as against IBRD countries, assuming all other factors being equal. It also recommends prioritising high-risk countries.

Project and product appraisal is conducted as per the criteria described in the final table in the guidance note (see page 9 in GRiF 2019). Evaluation and scoring for Part B (project appraisal) and Part C (product appraisal) are to be completed by the technical task team of the GRiF secretariat. A color-coded framework of appraisal is used review the co-financing proposals. The objective remains to achieve 'green' rating for all the indicators. A summary of indicators described as part the appraisal framework is presented in Table 1a below.

Table 1a: Summary of indicators for GRiF appraisal framework

S. No.	Indicator	Criteria
Part A: Portfolio appraisal		
A1	Level of economic development and vulnerability	IDA countries will be prioritized against IBRD countries, all other things being equal. Higher risk countries will be prioritized.
Part B: Project appraisal		
B1	Sustainability and exit strategy	The country is willing and able to allocate sufficient resources toward financial protection.
B2.	Country Ownership and Readiness	The country has the required documents in place demonstrating readiness and political support to work on DRF, e.g., DRF strategy, adequate legal and regulatory framework.
B3.	Comprehensive financial protection	Financial solutions should be part of an integrated and comprehensive financial protection strategy.
B4.	Participatory process	Appropriate stakeholder engagement is undertaken with communities, civil society organizations and private sector
B5.	Improvements in preparedness and resilience	The project demonstrates how the GRiF contributions will enable improved preparedness and resilience, either directly (in the project) or indirectly (incentives).
B6.	Capability, plans and systems	The project demonstrates that pre-agreed plans and/or distribution systems are in place or being developed to channel the funding to the targeted beneficiaries.
B7.	Accountability and clear decision-making processes	The project demonstrates clear accountability rules and decision-making processes either in place or under development as part of the project.
B.8	Target beneficiaries	The project explicitly targets benefits to vulnerable people and steps taken to support targeting of funds, with a special consideration of gender issues.
Part C: Product appraisal		

C1.	High-quality, open data and models	The project demonstrates how data and risk modelling will be subject to external review and made publicly available.
C2.	Value for money (VFM) and suitability of the product	The project demonstrates the added value of the proposed product/strategy in the country's disaster risk financing strategy against their objectives and relative to the alternatives (qualitatively and quantitatively).
C3.	Communication of the product	The project demonstrates clear understanding of the product by the client or actions taken to ensure the client understands the product and it is fully transparent to the client.
C4.	Quality and reliability of the product	The project demonstrates how the quality and reliability of the product will be monitored.
C5.	Procurement process and non-preferential treatment	The project demonstrates how far the placement of the financial product will follow a competitive and transparent process.

Source: GRiF 2020

d) Official development assistance (ODA)

ODA is the assistance provided by donors to countries and territories that feature in the Development Assistance Committee (DAC) list of ODA recipients[49] and to multilateral development institutions. It consists of grants and concessional loans. ODA transaction could be bilateral as well as multilateral, including transactions to national and international non-government development organisations. ODA can also be provided by non-DAC members.

There is no set method for allocating ODA. It is typically targeted towards the poorest countries therefore income level of countries (measured by GNI per capita) remains a critical factor in allocating assistance. However, historical and cultural relations with partner countries and national security concerns are among other factors that influence the selection of partners and allocation of ODA in bilateral transactions. There are few examples of countries which have developed their own criteria for allocating aid. Luxembourg for example uses Human Development Index (HDI) ranking as benchmark and selects countries among those with lowest ranks. Netherlands uses factors like GNI per capita, positive trends in democratisation and governance, volume of aid per capita, perceived value-addition to Dutch development cooperation, historical ties and number of donors already represented in a country.

[49] DAC list of ODA recipients is available at https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/daclist.htm

Annex 2: Inclusion and treatment of qualitative criteria

Qualitative criteria could also be used to quantify the suggested (see Section 4.3) and additional factors for which quantities/data are not readily and/or widely available. However, inclusion of such indicators would have implications for the underlying method suggested in this guidance document for calculating score/value of the scaling factor. The multi-criteria decision model (MCDM) suggested in the guidance should be modified to define the qualitative criteria, along with the quantitative criteria[50]. The modified approach would be similar to the one described in the guidance note developed for measuring 'value for money' of PCS interventions (see Ward et al., 2022). Following is a summary of steps to be taken in the modified approach.

As a first step, qualitative criteria for the suggested (and additional) factors should be determined. For example, an indicator for country's prior policy performance in DRM (and DRF) could be judged by evaluating the qualitative criteria such as, whether the country has a DRF strategy/policy/plan in place and whether there is adequate support in legal and regulatory framework for the same, among others (see criteria B2 in GRiF 2019).

In the next step, a scoring method should be designed to assign scores against different qualitative and quantitative criteria on a standard metric. Typically, in such multi-criteria decision models, scoring is assigned in a range (e.g., 0-5, 0-10, 0-100), where a wider range provides more flexibility in scoring.

Scoring the qualitative criteria requires expert judgment, based on which, best (maximum) and worst (minimum scores can be defined. Similarly, for a quantitative criterion, score for an expected quantity/value can be relative to pre-defined highs and lows. Other, more subjective ways to score quantitative criteria may also be valid. Furthermore, there could be a scenario where the scoring scale for a (readily available) index (e.g., CPIA) is different from the designed scoring methodology. Unitary method may be used to convert scores to same scale. For example, if the score for an indicator is 3.2 on a 6-point scale, it would be approximately 5.33 (i.e., (3.2/6) * 10) on a 10-point scale. Though, it is a much straightforward approach, but it may not be suitable in some cases (e.g., where minimum values of scales are different).

Scoring should be done through a participatory and consultative process involving a wider group of stakeholders. Appropriate justification should be provided for the assigned scores to ensure transparency in allocation decisions.

As a next step, weighing criteria should be determined to account for SMART PCS allocation principles and priorities (see discussion in Section 4.2.1 on considerations for PCS allocation). Weights could be determined once scoring has been completed or after best and worst scores for a criterion are identified. Assigning weights requires expert judgement and consultations. The weighing process could follow a subjective, objective or an integrated approach (see Odu 2019 for discussion on weighing methods for MCDM).

[50] Notable here is that some of the proxies for the factors suggested in Section 4.3 are already in the form of index scores, which have been developed using both qualitative and quantitative criteria (see for example, the ND-GAIN index and the CPIA).

Weights and scores can be aggregated using either additive method (*viz.*, $(s_1 * w_1) + (s_{2*}w_2) + \ldots (s_n * w_n)$) or a multiplicative method (*viz.*, $({s_1}^{w_1}) * ({s_2}^{w_2}) * \ldots ({s_n}^{w_n})$), where, final score in the latter is less sensitive to selected weights. A similar method/procedure to aggregate weights as exponents is suggested in Section 4.4, which is more suited to quantitative indicators.

Annex 3: A potential alternative to determine the size of premium support

Climate change attribution science (hereafter, attribution science) could be an alternative method to decide allocation size for premium support. Simply put, attribution science can help in scientifically ascertaining the mechanisms that are responsible for climate change i.e., whether and how much of recent climate change is caused by anthropogenic activities (human-induced) and how much has been due to natural causes. For climate insurance purposes, climate modelling (e.g., global climate models, probabilistic event attribution) could be used to estimate changes in the risks of climate-related damages in a specific location and to what extent it can be attributed to climate change (Otto 2020; James et al. 2019). A risk insurance premium share equivalent to the portion of risk attributed to climate change could be funded by the donors as premium support (ibid). As highlighted by Otto (2020):

> *"…Rather than waiting until the total damage has been determined, which can take weeks, they (insurance providers) can pay out when droughts occur that exceed a specific extreme index—for example, a drought to be expected every twenty years or more. In this type of insurance, it is significant if an event that previously occurred every twenty years (i.e., exceeded the index every twenty years or so) is suddenly to be expected every five years—and can therefore cause much greater damage. If insurance companies want to profit from this model in the long term, they will need to keep raising premiums. At some point, many poorer countries will not be able to afford it—even today, some cannot or do not want to pay. The poorest of the poor will have very few options to escape their predicament. Attribution science may provide one solution. We could begin by calculating how the risk of climate damage has changed in a specific location and to what extent we can attribute this to climate change. This portion of the risk could be covered by an international fund paid into by industrialized countries. It would therefore be worthwhile for insurers to continue doing business in developing countries[51], who would continue paying their usual premiums but still receive full protection."*

In a more practical application of attribution science to risk insurance, New et al. (2020) used drought-related agricultural losses in case of Malawi to estimate 'climate change-implicated' weather losses to determine equitable contribution to weather insurance premium in Africa.

Although considerable progress has been made in recent years to assess the influence of attribution of climate change to an extreme event, attributing the influence of climate change on natural and social systems (among many confounding factors) is still a big challenge (New et al. 2020). Further, other considerations like country's ability and willingness to pay still have to be integrated into such assessments. Therefore, while attribution science could offer an objective way to estimate externally supported premium share, further research and evidence is warranted to make it practically usable for this purpose.

[51] "Even now, insurers are only making a profit from many countries because of the millions contributed by countries like Germany and institutions like the World Bank." (Otto 2020).