

Meeting the global challenge of adaptation by addressing transboundary climate risk

A joint collaboration between SEI, IDDRI, and ODI



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When negotiating the Paris Agreement, many countries called for a stronger focus on adaptation. This call became more powerful after the Intergovernmental Panel on Climate Change (IPCC) outlined the high likelihood of unavoidable climate change impacts in its Fifth Assessment Report. The result was Article 7.1. of the Paris Agreement, which established a new – and unprecedented – global goal on adaptation.¹

At the time, the 21st session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) agreed to treat adaptation “in balance” with mitigation. However, mitigation remains the main focus in international debates and analysis on climate change governance.

We argue that the critical importance of adaptation is still under-valued in international negotiations. Specifically, the view that adaptation is a local problem is holding back ambition to pursue a global adaptation agenda that seeks solutions beyond the local-to-national level.

It is important to recognise that, although Parties have agreed to limit warming to “well below” 2°C, the nationally determined contributions (NDCs) that have been submitted would result in warming closer to 3°C.^{2,3} Even this may be optimistic, as the 3°C estimate presumes that countries achieve their targets, which few are on track to do. With this reality as a backdrop, it is imperative to increase adaptation action worldwide and, in so doing, to scale up efforts from the local to the global. This is increasingly articulated by both developing and developed countries around the globe; of the 165 NDCs submitted to date, at least 137 include information about adaptation.⁴

In this brief, we argue that adopting a transboundary view of climate risk, which explicitly recognises the interconnections between people, ecosystems and economies in a globalised world, changes the scope and nature of the adaptation challenge, and creates opportunities to reinvigorate international cooperation on adaptation. Specifically, the UNFCCC remains a critical space for coordinating global action on climate change, including building resilience and adapting to the adverse effects of a warmer world. In this respect, the outcomes of UNFCCC negotiations are important for understanding the progress made to date on adaptation, as well as for highlighting gaps, or framing and steering the conversation in new directions. Global negotiations on climate change therefore have a key role to play in adopting and implementing a transboundary framing of climate risk, though other non-climate conventions and processes can play important roles as well.

We therefore review recent progress in the international climate negotiations in order to set up a discussion in the second half of the brief about how progress in meeting the global challenge of adaptation might be achieved.

IMAGE (ABOVE):

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Where are we now? Progress at COP23

COP23 was a working meeting, held in Bonn, Germany in November 2017. Negotiators set their sights on continuing to translate the goals and commitments made in Paris into a set of rules, processes, and structures that is comprehensive, but not cumbersome. This is no simple task, and Parties hope to conclude their work at COP24 in 2018, where they intend to finalise the “Paris Rulebook.” In view of this, COP23 was part of a critical transition from aspiration to action. The development of the rulebook will be central to the way the global community understands progress towards – and fulfilment of – the Paris Agreement goals.

For adaptation, several important items were on the negotiating table (Figure 1), all of which will continue to be developed in the coming months. To begin, the **global goal on adaptation** is a central element. Much like the 1.5°C and 2°C temperature goals set out in Article 2 of the Paris Agreement, the global goal on adaptation is an aspiration that motivates climate action:

“Parties hereby establish the global goal on adaptation of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development and ensuring an adequate adaptation response in the context of the temperature goal referred to in Article 2.” (Article 7.1)

Unlike the 1.5- and 2-degree targets, however, the global goal on adaptation is much more difficult to measure and assess, as there are no universally accepted definitions for climate adaptation, or agreed-upon metrics for measuring resilience built or risks reduced. The **global stocktake**, tasked with assessing collective progress towards achieving the Paris Agreement, therefore becomes critical for discussions about how climate change adaptation should be understood and measured. As such, negotiations have focused substantially on developing the stocktake, both in terms of process and inputs.

Negotiators still have a long way to go before agreement on specific targets and measures. But at COP23, some progress was made on the guidance for one of the stocktake’s inputs: **adaptation communications**.

Final decisions regarding the core purpose(s) and elements of the adaptation communications have not yet been made. However, there is agreement that the overarching objectives of the communications should include contributing to and assessing progress towards achieving the global goal on adaptation, as well as communicating Parties’ needs and actions.⁵ At COP23, the informal note from co-facilitators outlined two proposals:⁶ one for vehicle-specific guidance (or guidance for communicating adaptation within NDCs, National Adaptation Plans (NAPs) and National Communications), and another for general guidance. Further options were articulated within each proposal.

Among the key questions are:

1. Should adaptation communications focus on the country’s needs and risks, and/or on the resilience it has already built?
2. How much should the information communicated by developing countries differ from that communicated by developed countries? Specifically, should developed countries report adaptation finance as a core part of their adaptation communications?

The note from COP23 co-facilitators also reflected the importance of ensuring that flexibility is built into the adaptation communications and that they do not impose an additional burden, particularly on developing countries.

Closely linked to the adaptation communications negotiations are ongoing discussions about the **National Adaptation Plans (NAPs)** and the development of the **transparency framework**.

NAPs have the potential to be used as a component of, or vehicle for, adaptation communications, though progress in preparing NAPs has been slower than many hoped. As of February 2018, only 10



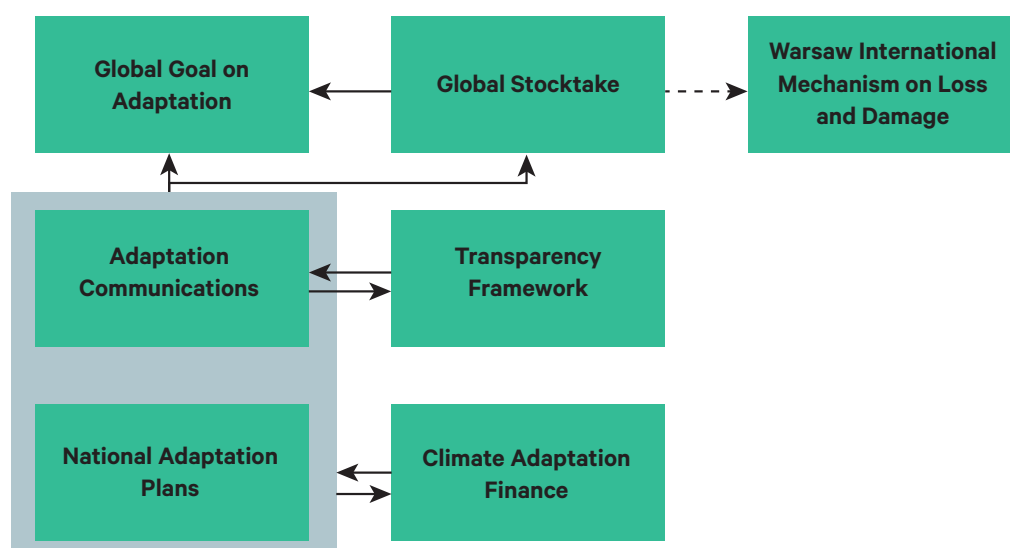
Aerial photo of the River Nile © GETTY

countries had submitted their NAP, out of more than 130 developing country Parties. The Adaptation Committee's NAP Task Force and the LDC Expert Group (LEG) have both been involved in supporting the development and use of NAPs. In parallel, the Green Climate Fund (GCF) has allocated up to USD 3 million per country to facilitate NAP preparation. As of the GCF's last board meeting in March 2018, 17 of the 47 proposals for support for the development of NAPs had been approved or endorsed.⁷ The Adaptation Committee has prepared a paper highlighting the experience of developing countries in accessing support for developing NAPs through the GCF Readiness Programme for adaptation.^{8,9}

The transparency framework aims to build trust and confidence among Parties to facilitate the successful implementation of the Paris Agreement. Parties are expected to provide information on the impacts of climate change and how they are adapting to them (Article 13.8), as well as information about financial, technological, or capacity-building support provided or received (Articles 13.9 and 13.10). Negotiations on transparency were some of the most productive at COP23, with a focus on the type and form of specific information to be reported. A key issue is whether to differentiate between adaptation communications and the reporting on adaptation and climate impacts to the transparency framework. Similar to the adaptation communications, sticking points emerged around the development of common modalities, procedures, and guidelines that are not overly burdensome for developing country Parties with limited reporting capacities, but that remain robust, "common" and comparable.

Finally, conversations about **adaptation finance** remained important at COP23. Success on this topic is critical to meeting the global challenge of adaptation because action will require substantial flows of financial resources, especially in developing countries. Negotiators reaffirmed critical elements of past finance negotiations, including the commitment to scale up finance levels to USD 100 billion per year by 2020. There is a need to consider the role that climate adaptation finance may play in the development of risk assessments and adaptation needs (either through NAPs, adaptation communications, or other avenues), as well as in adaptation or resilience-building efforts. Relatedly, one key institution for financing adaptation is the Adaptation Fund, whose fate remains somewhat uncertain under the Paris Agreement. Negotiations at COP23 continued to address disagreements about the Adaptation Fund's role, including who is eligible to receive finance and where that financing will come from.

Figure 1: Linkages between adaptation negotiating elements at COP23.



The global stocktake is intended to measure progress made towards the global goal on adaptation, and has the potential to measure similar progress on the Warsaw International Mechanism for Loss and Damage. Adaptation communications will be important inputs for this process, some of which may take the form of – or be heavily informed by – National Adaptation Plans. The information included in the adaptation communications should be in line with common modalities, procedures and guidelines developed as part of the transparency framework. Climate adaptation finance will be needed to both develop the risk assessments and adaptation needs contained in the adaptation communications and NAPs, as well as to address the identified adaptation priorities through projects and programmes aimed at building resilience.

Adaptation as a Global Challenge

International climate negotiations are poised to tackle some of the most delicate issues for adaptation action within the coming months. Critical conversations have begun about how adaptation can be measured and assessed, and how it can be supported and pursued. In addition, as we approach this important juncture for implementing the Paris Agreement, there is a need to think critically and engage in potentially difficult conversations about what adaptation is and the role that it plays in climate policy as a whole, and our societies more broadly.

Given the Party-driven nature of the UNFCCC and the design of the Paris Agreement, adaptation is mainly envisioned through a national-scale lens. Hence, adaptation needs, implementation and finance are identified, monitored and allocated on a national basis, drawing mostly on nationally determined assessments. But climate risks are shared across borders; therefore, there are national – and regional and global – benefits to successful, coordinated adaptation. This transboundary dimension needs to be better understood in order to ensure that international cooperation works towards achieving the global goal on adaptation.

One of the defining features of adaptation within the Paris Agreement is the recognition by all Parties that “adaptation is a global challenge faced by all with local, subnational, national, regional and *international dimensions*” (Article 7.2, emphasis added).

The international dimensions of adaptation have hitherto not been widely acknowledged. The emphasis in the majority of climate change impacts, vulnerability and adaptation research – as well as the vast majority of national adaptation plans and strategies – has been on the local-to-national dimension, considering “direct” climate impacts within a country’s borders.

However, given the reality of globalisation, climate risk is in many cases “borderless” in nature. Climate impacts in one country will create risks and opportunities – and therefore may require adaptation – in other countries, due to cross-border connectivity within regions and globally. For the same reasons, adaptation measures taken in one part of the world have the potential to alter and affect cross-border links and flows, and therefore can have positive and/or negative effects in other places.

Climate change impacts cross national borders via at least four climate risk pathways:¹⁰

- **trade**, by disrupting the price, quality and availability of goods and services on international markets and supply chains;
- **biophysical**, by altering the flows in transboundary ecosystems, including river basins, arid lands, oceans and air currents;
- **people**, through changes in the flow of international tourists and migrants; and
- **finance**, where climate events and gradual changes alter the return on overseas investments and remittance flows.

Transboundary climate risk will affect countries in different ways, depending on the extent and nature of their global integration and their specific links with other vulnerable countries. It is a dimension of risk that will affect both rich and poor countries, suggesting that it should be negotiated in inclusive international forums such as the UNFCCC, as well as other UN conventions. It is also important to consider the role of adaptation in reducing – rather than redistributing – vulnerability globally.^{11,12}

The motivations for undertaking and financing adaptation therefore hold a global logic, as well as a national, domestic one. In many ways, adaptation represents a global (or at least transnational) **public good**. Achieving climate resilience in all countries benefits all countries because of the interdependence that characterises the world today. In this sense, the failure of adaptation can be seen as a global public “bad” because it will produce risks from which no country is able to fully isolate itself. International supply chains, migration patterns, financial systems and shared ecosystems will be destabilised to everyone’s disadvantage, leading to a situation of “climate change contagion” in the global economy.

This should be recognised in the policies, governance mechanisms, financial provisions and international negotiations at the global level that facilitate adaptation.



Freight containers at a California port
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TRANSBOUNDARY FOOD SECURITY – CONNECTING SENEGAL AND THAILAND

Senegal is dependent on rice imports for its food security. The effects of climate change impacts on rice yields in countries like Thailand, Vietnam and India – key exporters of rice to Senegal – therefore determine Senegal's climate risk exposure. Furthermore, policy measures taken by rice exporting countries (such as export bans), as well as by fellow rice importing countries (such as hoarding rice stocks), determine how global prices react to poor harvests as a result of extreme or unusual weather. Senegal's vulnerability is therefore a product of measures taken by countries thousands of miles away, raising the need for global cooperation to adapt in the face of climate risks to food security.

For more information on this example, see Reducing vulnerability to food price shocks in a changing climate, an SEI Discussion Brief by Magnus Benzie and Adam John. Available at: www.sei.org/publications/reducing-vulnerability-to-food-price-shocks-in-a-changing-climate/

TRANSBOUNDARY ADAPTATION PLANNING: THE MEKONG RIVER BASIN

In recent years, the focus on transboundary water resources, particularly shared river basins, has increased significantly. Worldwide, there are now several river basin commissions that promote transboundary adaptation examples and facilitate discussions among states that share water resources. One such example is the Mekong River Commission, which developed the Climate Change and Adaptation Initiative in 2009 aimed at facilitating transboundary adaptation planning in the Lower Mekong Basin. More recently, it developed the Mekong Strategy and Action Plan – also for the Lower Mekong Basin – which includes a vision for a resilient future and outlines adaptation strategies to achieve it.

For more information on this example see Moving towards a growing global discourse on transboundary adaptation, an ODI Briefing paper by Rebecca Nadin and Erin Roberts: <https://www.odi.org/publications/11088-moving-towards-growing-global-discourse-transboundary-adaptation>

Parties – as well as researchers and practitioners – need a shared language to describe those aspects of climate impacts, risk and adaptation that extend beyond the local and national scale.

Ways forward

Currently, a diverse terminology is used to describe the phenomenon of transboundary climate risk. But in order to clarify what is at stake and to delineate the scope and potential for meeting the global adaptation challenge, Parties – as well as researchers and practitioners – need a **shared language** to describe those aspects of climate impacts, risk and adaptation that extend beyond the local and national scale. This shared language should distinguish between risks at different scales, for example:

- Truly global-scale risks (such as some climate-sensitive infectious diseases) that require internationally coordinated adaptation responses by states and non-state actors.
- Regional-scale climate risks (such as regional watershed management), which require coordinated responses by two or more neighbouring states.
- Teleconnections and climate risks spreading through networks with a global reach (such as extreme weather events affecting the value of foreign direct investments).
- Adaptation responses in one place affecting the level of vulnerability – and by implication, the feasibility of various adaptation options – in another place (such as the price impacts in faraway markets that shift agricultural production from old staples to new crops).

We recommend that the adaptation community, possibly led by the Intergovernmental Panel on Climate Change (IPCC), aspire to develop a **more consistent terminology** around transboundary

climate risk. This would enable the comparison and synthesis of evidence on the nature and extent of the risks, and relevant adaptation options. The current outline of the IPCC's Sixth Assessment Report suggests that "transboundary risks" will be given attention in Chapter 16 on key risks across sectors and regions. This presents an excellent opportunity to organise the research field.

Transboundary climate risk has so far mainly been assessed by and for developed countries, especially in Europe (Finland, the UK, the Netherlands, Sweden, Norway, Germany and the EU have all conducted or are in the process of conducting their own assessments), which means it has been implicitly framed as a rich-country problem. This is too narrow a view, as it suggests that direct, local climate risks – rather than transboundary risks – are most urgent for developing countries. However, an indicator-based study of exposure to transboundary risks suggests that many developing countries are also highly exposed.¹³ In this way, adaptation is very much a **global challenge** shared by developed and developing countries alike.

We advocate including a transboundary framing of climate risk in adaptation negotiations within the Ad-hoc Working Group on the Paris Agreement (APA) and the Conference of the Parties (COP). Beyond the UNFCCC, there is a need to share responsibility and work together, through a **community of practice** that convenes relevant actors from within and beyond the UNFCCC process, including other relevant UN Conventions (such as the UN Convention to Combat Desertification) and non-state actors.

A key concern here is that successfully adapting to both local and transboundary climate risks – and thus meeting the global challenge of adaptation – requires **more than money**. Current pledges to provide international adaptation finance are insufficient, and one objective of raising the profile of this issue is to highlight the shared benefits of more ambitious investments in adaptation. However, improved, fairer and more equitable regional and global governance may offer one of the most efficient ways to reduce and manage transboundary climate risk and therefore support adaptation globally.

The opportunity provided by the Paris Agreement to meet the global adaptation challenge is in danger of being missed.

One option is to cease the enforcement of trade rules that currently prevent import-dependent countries from building resilience in their domestic food supply chains, and thus adapting to risks associated with volatile international staple food prices. However, many donors currently discourage any food security adaptations that may be interpreted as distorting trade (such as imposing tariffs to protect nascent domestic production of imported staples). Adaptation donors could better align aid with recipients' need to strengthen **resilience**; for example, they could help recipient countries temporarily protect domestic markets and reduce their vulnerability by improving grain storage, insurance and collective buying agreements. But donors are unlikely to make such strategic decisions without a major shift in the framing and discourse of international climate cooperation – and subsequently in other areas of diplomacy, such as trade negotiations – which in turn supposes a shift in understanding the multi-scale nature of global adaptation.

Global Choices

The Paris Agreement frames adaptation as a global challenge and includes various provisions – including the global goal on adaptation, the global stocktake, the transparency framework and the ongoing design of climate finance provisions – that can be made operational to support a global approach to adaptation.

However, the lack of clarity, agreement and definition of many of these provisions – as well as the low level of ambition shown so far in support of adaptation finance (and the mitigation and the pre-2020 agenda in general) – represent barriers to effective global governance and implementation of adaptation.

The opportunity provided by the Paris Agreement is in danger of being missed. Significant work remains to be done in order to meet the global adaptation challenge.

As Parties prepare for COP24 in Katowice, Poland, the critical pre-2020 period of global negotiations on adaptation may go in one of two directions: business-as-usual adaptation or towards meeting the global challenge.

Scenario A: Business-as-usual adaptation

In this scenario, adaptation continues to be framed as an exclusively local-to-national issue.

Support for adaptation is allocated and governed on the basis that local and national entities can adapt in isolation without the need for enhanced international cooperation. Adaptation discussions under the UNFCCC therefore remain focused on mobilising, tracking, monitoring and reporting needs and progress on adaptation from local up to national scales.

Applying this “bordered” lens, cycles of the global stocktake merely compile national needs and contributions into an international overview summary without taking account of spatial interactions and thus ignoring regional-to-global opportunities and risks. This orientation reinforces the understanding of adaptation finance as a political transfer from rich to poor – much like development assistance – rather than a shared global investment. The global goal on adaptation is unlikely to achieve its rhetorical or practical potential.

This scenario is more likely to see countries reach their limits to adaptation, as a result of under-investments in adaptation and competitive or even protectionist approaches to managing global commons and public goods. Transboundary climate risks will begin to magnify as climate impacts spill over from one country to another, and from national systems into regional and international ones.

Scenario B: Towards meeting the global challenge

In contrast, this scenario recognises the challenge of adaptation as truly global.

National Adaptation Plans (NAPs) consider countries’ exposure to transboundary risks and highlight the cross-border effects of their own adaptation plans. This information is synthesised and analysed, by third parties, in ways that support regional synthesis and a truly global stocktake of adaptation needs and progress, nationally, regionally, and transnationally. Adaptation communications contain summaries of national contributions to the “global public good”, as well as adaptation gaps that require regional and multilateral attention, bringing transboundary issues into the negotiations where new and additional support can be discussed and motivated.

In this scenario, the instruments contained within the Paris Agreement can be employed by the UNFCCC to genuinely add value to the existing international adaptation process.

The likelihood of Scenario B depends on how Parties frame and approach negotiations on adaptation over the coming months and years. Reasons for pessimism can be found in the busy and already-complex agendas that many Parties face, and the burden of prioritising new agenda items in relatively small delegations.

However, there are also reasons for optimism. The concept of transboundary climate risk appears to be rising in discussions and planning activities, especially by many developing countries. Two NAPs, submitted by Sudan and Burkina Faso, outline transboundary risks.¹⁴ The NAP technical guidelines produced by the Least Developed Countries Expert Group identifies the importance of promoting synergy and coordination at the regional level, including to reduce the impacts of transboundary risks.¹⁵ Additionally, several countries have identified transboundary climate risks in their NDCs. Regional adaptation is a priority for Angola, for example, which described its collaboration with Namibia and South Africa to reduce the vulnerability and increase the adaptive capacity of the Benguela fisheries system.¹⁶ Guinea’s NDC explicitly recognises the country’s



An irrigated field in the Limpopo Basin, South Africa © IFPRI -IMAGES / FLICKR

responsibility to manage its water resources for the benefit of its neighbours, as well as its own people.¹⁷ Furthermore, other countries, including Nauru, have identified global interconnections as key to their national circumstances in adaptation documents that lie outside of the official UN reporting mechanisms.¹⁸

What can the UNFCCC do?



A satellite image of the Nile Delta, Egypt
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The recent UNEP Adaptation Gap Report¹⁹ provides an overview of how to assess the global goal on adaptation, but it clearly assumes that the goal's achievement will be built on aggregated national actions. We recommend that its achievement also be understood as the product of adapting to transboundary risks, whether this takes place at the national, regional, transnational or global level. Metrics for assessing progress towards the goal should therefore not be constrained to metrics designed for assessing national-level adaptive capacity, resilience or vulnerability. In addition, they should include a way to track transboundary risks (i.e. climate impacts, and collateral effects of adaptation choices), in order to also capture regional and global adaptive capacity, resilience and vulnerability. The indicator set proposed in the Transnational Climate Impacts Index¹³ offers one starting point for developing such metrics.

Future adaptation communications – whether undertaken as stand-alone communications or as part of NAPs, National Communications or NDCs – should:

- summarise the contribution by each Party to global adaptation; and
- highlight exposure to transboundary climate risk that, if not addressed, will introduce risk into global systems and potentially redistribute vulnerability rather than reduce it. Suggestions have already been made on how the technical guidelines for NAPs could be amended to include transboundary climate risks¹⁰

The **global stocktake** must do more than aggregate national contributions. We propose adding an additional flow of data and synthesis to those identified in the UNEP Adaptation Gap Report, which would track and assess transboundary climate risks and regional or global adaptation responses.²⁰ This additional flow could be curated by third parties from civil society, research groups and other non-state actors, while involving Parties to the UNFCCC and international institutions. Examples of risks and adaptation efforts that could be tracked include: measures taken to cope with changing patterns of cross-border migration; climate risk management in global trade in agricultural commodities, including measures by non-state actors, by key exporting countries and in global commodity markets; and measures taken by banks, investors and companies to manage climate risks in financial markets.

The **Adaptation Committee** could convene a work programme on transboundary climate risks and adaptation responses, facilitate the sharing of best practices, and initiate discussions on how to identify and address the range of transboundary risks. The technical examination process on adaptation (TEP-A) could focus its technical examination meetings in 2020 on transboundary adaptation – or, more broadly, on global adaptation, which necessarily includes transboundary adaptation. Responding to adaptation as a global challenge will require an internationally coordinated response; as the UNFCCC's oversight body on adaptation, the Adaptation Committee should reflect and contribute to discussions and to building the knowledge base on global adaptation.

Least Developed Countries Expert Group (LEG): The technical guidelines for NAPs prepared by the LEG includes coherence at the regional level as part of its implementation strategy, but these guidelines could go further. Transboundary risks do not just occur within regions; in some cases, risks are shared with countries on the other side of the globe via teleconnections. This element of adaptation is becoming increasingly important and should be acknowledged in the NAP guidelines. Countries should also be provided with guidance on the transboundary dimensions of adaptation.

What can others do?

Non-Party and non-state actors, including private actors and regional and international organisations, could better align their efforts with those of Parties, in order to collectively avoid vulnerability redistributions and support adaptation to transboundary risks. We especially welcome increased attention to transboundary climate risks under the Marrakech Partnership, including in the reporting within the Yearbook of Global Climate Action.²¹

Donors and climate finance institutions should ensure adequate finance for addressing both local and transboundary climate risks and should design specific mechanisms to address *systemic global risks* in addition to local risks. The inclusion of transboundary climate risk in the adaptation mandate should not crowd out commitments and calls for funding adaptation to local risks that result from direct climate impacts; these are highly urgent in many places. Instead, we recommend donors and institutions review their portfolios to identify whether they are mainstreaming transboundary climate risks in a way that provides co-benefits to local adaptation. We also recommend that various international donors and institutions operating outside the climate regime consider how they can adjust their funding programmes.

Parties and stakeholders to other Conventions, as well as other relevant international governance initiatives and international law in general, should consider the extent to which existing norms and legal frameworks can be used to facilitate global adaptation to transboundary climate risks.²²

The time is right for a more concerted effort to seize the momentum of the Paris Agreement and ensure that this occurs within the global climate regime.

A clear need for action

It remains to be seen whether these measures will be sufficient to ensure enhanced international cooperation to meet the challenge of global adaptation. Transboundary climate risks are already detectable around the globe, demonstrating a clear need for mechanisms to address them at the international level. The time is right for a more concerted effort to seize the momentum of the Paris Agreement and ensure that this occurs within the global climate regime. While adaptation has belatedly been recognised as a policy priority on a par with mitigation, the truly global nature of the challenge – and the space that this creates for opportunities to jointly govern and invest in adaptation – is yet to be fully recognised. As the window continues to close on limiting global climate change to “manageable levels”, urgent action is needed to move from insufficient adaptation-as-usual to building genuine global resilience.

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¹ Magnan A.K. and Ribera T. (2016). Global adaptation after Paris. *Science (Policy Forum)*, 352 (6291). 1280-1282. DOI: 10.1126/science.aaf5002.

² The updated NDC synthesis report can be found at: http://unfccc.int/focus/indc_portal/items/9240.php.

³ According to Climate Action Tracker, current NDC pledges for 2030 or 2035 – if realised – imply emissions pathways that would lead to warming between 2.6°C and 3.2°C in 2100. See: <http://climateactiontracker.org/global.html>. The radical transformation that would then need to occur between 2030 and 2050 to stay below 2°C in 2100 appears highly unlikely.

⁴ See <http://unfccc.int/resource/docs/2017/tp/07.pdf>

⁵ Adaptation Communications are required under Article 7.10 of the Paris Agreement.

⁶ The informal note can be found at: http://unfccc.int/files/bodies/apa/application/pdf/apa_item_4_informal_note_14112017_final_iteration.pdf.

⁷ See GCF/B.19/32/Rev.01, Paragraph 66, available online at: https://www.greenclimate.fund/documents/20182/953917/GCF_B.19_32_Rev.01_-_Readiness_and_Preparatory_Support_Programme__Revised_work_programme_for_2018.pdf/74f06371-071f-47f4-bfa1-6c377790e9e6

⁸ See: http://unfccc.int/files/adaptation/groups_committees/adaptation_committee/application/pdf/ac12_8ai_readiness.pdf

⁹ The decision on NAPs from COP 23 can be found at: <http://unfccc.int/resource/docs/2017/sbi/eng/l35.pdf>.

¹⁰ Benzie (2014). National Adaptation Plans and the indirect impacts of climate change. SEI policy brief, <https://www.sei.org/publications/national-adaptation-plans-and-the-indirect-impacts-of-climate-change/>

¹¹ Atteridge and Remling. (2017). Is adaptation reducing vulnerability or redistributing it? *WIREs Climate Change* 2018, 9. DOI: 10.1002/wcc.500

¹² Magnan, A.K., Schipper, E.L.F., Burkett, M., Bharwani, S., Burton, I., Eriksen, S., Gemenne, F., Schaar, J. and Ziervogel G. (2016). Addressing the risk of maladaptation to climate change. *WIREs Climate Change* 7(5): 646-665. DOI: 10.1002/wcc.409.

¹³ Benzie, M, Hedlund, J. and Carlsen, H. (2016) Introducing the Transnational Climate Impacts Index: Indicators of country-level exposure, SEI Working Paper 2016-07. Stockholm Environment Institute: Stockholm. <https://www.sei.org/publications/transnational-climate-impacts-2/>

¹⁴ The NAPs that have been submitted are available on NAPs Central at: http://www4.unfccc.int/nap/News/Pages/national_adaptation_plans.aspx.

¹⁵ The NAP technical guidelines prepared by the LEG is available at: http://unfccc.int/files/adaptation/cancun_adaptation_framework/application/pdf/naptechguidelines_eng_high_res.pdf.

¹⁶ Angola's NDC is available at: <http://www4.unfccc.int/submissions/INDC/Published%20Documents/Angola/1/INDC%20Angola%20deposito.pdf>.

¹⁷ Guinea's NDC is available at: http://www4.unfccc.int/ndcregistry/PublishedDocuments/Guinea%20First/INDC_Guinea_english_version%20UNFCCC.pdf

¹⁸ See Republic of Nauru Framework for Climate Change Adaptation and Disaster Risk Reduction (RONAdapt): <https://reliefweb.int/report/nauru/republic-nauru-framework-climate-change-adaptation-and-disaster-risk-reduction-ronadapt>

¹⁹ UNEP (2017) The Adaptation Gap Report 2017: Towards Global Assessment. United Nations Environment Programme: Nairobi, Kenya. <http://web.unep.org/ourplanet/december-2017/unep-publications/adaptation-gap-report-2017-towards-global-assessment>

²⁰ See page 13, UNEP Adaptation Gap Report 2017: https://wedocs.unep.org/bitstream/handle/20.500.11822/22172/adaptation_gap_2017.pdf?sequence=1&isAllowed=y

²¹ See Yearbook of Global Climate Action 2017: http://unfccc.int/tools/GCA_Yearbook/GCA_Yearbook2017.pdf

²² Kirbyshire, A., Lovell, E., Nadin, R., Roberts, E., Tanner, T. and Weingartner, L. (2017). Moving towards a growing global discourse on transboundary adaptation, In *Resilience Scan*. <https://www.odi.org/sites/odi.org.uk/files/resource-documents/11823.pdf>