Briefing note

Moving towards a growing global discourse on transboundary adaptation

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March 2018

Key messages

- Regional cooperation is needed to manage shared ecosystems and consider the transboundary risk implications of National Adaptation Plans (NAPs) and Intended Nationally Determined Contributions (INDCs). The need for transboundary adaptation and global cooperation on adaptation will be increasingly important, as the impacts of climate change span national borders. National adaptation actions can themselves generate transboundary risks.
- Transboundary resource management is not a new concept, but there is a need to develop transboundary adaptation frameworks and response measures that build upon existing regulatory approaches in international environmental law, and to develop the work of intergovernmental organisations and regional advocacy organisations.
- There are opportunities to enhance work on transboundary adaptation through existing mechanisms under the Rio Conventions, including UNCCD and UNFCCC through the Paris Committee for Capacity-Building and associated funds (the Global Environment Facility (GEF), the Land Degradation Neutrality (LDN) Fund, the Adaptation Fund, among others).
- The 2015 Paris Agreement has recognised that adaptation is a global challenge and has accepted the local, subnational, national and regional dimensions of climate change. The Global Goal on Adaptation (GGA) has a significant role to play in providing a framework for enhancing transboundary and global cooperation on adaptation.

Summary

The scientific consensus is clear. Climate change will alter the frequency, intensity, duration, timing and location of extreme weather and slow-onset events. It will also lead to creeping environmental changes, such as shifts in seasons or sea-level rise (IPCC, 2014; 2012). Changes such as these serve as additional stress factors on ecosystems and on the support they provide for livelihoods, well-being and economies (The Desakota Study Team, 2008). Understandably, in response, adaptation measures have generally been focused on developing national, subnational and sector plans, with actions often taking place at community or local levels. Yet, it has long been understood that the effects of climate change are transboundary, crossing political borders and impacting shared resources.

Countries are geographically linked and have joint reliance on key natural resources. Climate change is putting additional pressure on already stressed resources. Countries must increasingly manage many interacting drivers of vulnerability and risk that are too large for any one country to address alone. For example, food security and water resources are often transboundary in nature and can lead to resource conflict if not adequately addressed at an early stage. With globalisation, national economies are increasingly interconnected and interdependent through trade, supply and value chains.

The development of transboundary adaptation approaches could provide an opportunity to manage these risks more effectively. In addition, there is growing awareness that adaptation efforts in one country can significantly impact the natural resources and adaptive capacity of another country. These include damming of shared water sources for domestic irrigation needs without consideration for downstream countries, changes in agricultural priorities and policies that affect regional or global food security. Therefore, regional cooperation is needed to manage shared ecosystems and consider the transboundary risk implications of National Adaptation Plans (NAPs).

The aim here is to provide an overview of some of the emerging issues for transboundary adaptation and to encourage a global discourse on how the Rio Conventions, such as the United Nations Framework Convention on Climate Change (UNFCCC) and the United Nations Convention to Combat Desertification (UNCCD), can serve as a platform for enhancing work on transboundary adaptation. The key messages include:

- The need for transboundary adaptation and global cooperation on adaptation will be increasingly important, despite the political and implementation challenges, as the impacts of climate change span national borders. National adaptation actions can themselves generate transboundary risks.
- Challenges exist, including political ones, but there are opportunities to enhance work on transboundary adaptation through existing mechanisms under the Rio Conventions. These include UNCCD (the promotion of landscape approaches to sustainable land management), and UNFCCC (enhancing capacity on transboundary adaptation) through the Paris Committee for Capacity-Building and associated funds (the Global Environment Facility (GEF), the Land Degradation Neutrality (LDN) Fund, the Adaptation Fund, among others). Developing more synergy and coherence between UNCCD, UNFCCC and the Convention on Biological Diversity (CBD) would provide a strong basis for action.
- Transboundary resource management is not a new concept. It presents an opportunity to develop transboundary adaptation frameworks and response measures that build upon existing regulatory approaches in international environmental law, and to develop the work of intergovernmental organisations and regional advocacy organisations.
- The 2015 Paris Agreement has recognised that adaptation is a global challenge and has accepted the local, subnational, national and regional dimensions of climate change.[1]
- The Global Goal on Adaptation (GGA) has a significant role to play in providing a framework for enhancing transboundary and global cooperation on adaptation, especially given the increasingly important role of transboundary adaptation in enhancing adaptation capacity, increasing resilience and reducing vulnerability.[2]
- It is important to undertake transboundary adaptation through the NAPs and the intended nationally determined contributions (INDCs). Some countries are already doing this. This work could be enhanced through guidance from the UNFCCC Adaptation Committee, for example.
- Support (including regulatory frameworks, political will and finance) remains a critical element to ensure that transboundary adaptation is implementable.

1 The Paris Agreement of 2015 requests that countries strengthen regional cooperation on adaptation, including the use of regional centres and networks.

2 The GGA was established in the Paris Agreement with the aim 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' (UNFCCC, 2016a: 25-26). The GGA is not defined further in the Agreement but it was agreed that the Global Stocktake, the process to establish progress on achieving the global goals that will take place every five years, will review the progress towards achieving the GGA.

Introduction

The scientific consensus is clear: climate change will alter the frequency, intensity, duration, timing and location of extreme weather and slow-onset events, and contribute to creeping environmental changes, such as shifts in seasons or sea-level rise (IPCC, 2014; 2012). Where particular ecosystems are degraded, or natural resources overexploited (for example, by economic marginalisation, insecurity or political mismanagement), shifting climate regimes and extreme events may challenge the ability of ecosystems to continue to provide the services upon which some populations and economies have come to depend. Climate change will ultimately affect all countries, and its effects – from droughts to floods – do not respect political borders.

The 2015 Paris Agreement saw the international community agree that adaptation to climate change is a global challenge (UNFCCC, 2016a). Addressing climate change requires technical transfer of adaptation response measures and financial input across borders. Moreover, the climate change strategies of one country can affect the resilience of another country, and where certain nations are unable to adapt, there will be repercussions at all levels (Magnan et al., 2015). Countries may be geographically linked and rely on shared natural resources, such as water, the flows of which often span national and international borders and represent interacting risks and drivers of vulnerability. And, in our increasingly globalised world, countries must also account for the interdependency of global supply and value chains. If, for example, as part of a suite of adaptation response measures to a drought, a country stops or restricts agricultural exports to ensure food security, it can export its volatility to the rest of the world through price shocks. The volatility of the global commodity markets is therefore recognised as an issue for international coordination (Magnan et al., 2015: 10-11). The UK Met Office states that governments are 'seriously underestimating' the risks of crop disasters occurring simultaneously in major farming regions around the world (Kent et al., 2017). The Met Office research posits a 6% chance that a concurrent failure in maize production could occur every decade in China and the US – the world's main growers – resulting in potentially catastrophic food shortages and price hikes in Africa and South Asia.

Adaptation measures can be local in application, but regional and global in implication

One such scenario happened during the global food crisis of 2007 and 2008. The price of wheat, maize and rice doubled, hitting many developing countries hard. In Senegal, for example, while rice makes up 30% of the nation's diet, just 15% of supply is produced domestically (SEI, 2016). The other 85% is imported, primarily from Thailand and Vietnam, whose rice-producing regions are exposed to sea-level rise and threatened by a growing risk of drought and soil salinisation (SEI, 2016). Recognising its vulnerability to increasing rice prices, the Senegalese government has developed the Accelerated Programme for Agriculture in Senegal (PRACAS), aiming to be self-sufficient in rice production by 2017. But this strategy has wider implications. It will reduce agricultural diversity, making producers more vulnerable to exogenous shocks (either affecting the global price of rice or decreasing yields, and will also displace other crops), which can be a source of food and income for food-insecure households (SEI, 2016).

Adaptation measures can be local in application, but regional and global in implication. That is, action at the local level may be insufficient to deliver the adaptation required, or might increase vulnerabilities across shared ecosystems that support agricultural production. For example, if China's adaptation planning moves agricultural production from the traditional breadbasket provinces of Jiangxi and Jilin to the Tibetan Plateau due to the expected impacts of climate change, this could have significant implications for transboundary water resources and the 18 countries with which China shares rivers and lakes.

As such, there is increasing recognition that adaptation measures that cross regional boundaries will be necessary. Transboundary adaptation approaches are becoming more prominent in discussions at a number of the Rio Conventions, including the UNCCD,[3] and in the imminent future will require the UNFCCC to address the issue more formally, developing approaches and facilitating support to meet some of the inherent challenges of building transboundary resilience.

What is transboundary adaptation?

Traditionally adaptation has been implemented at national and subnational levels, often driven by frameworks developed under the UNFCCC, such as the National Adaptation Programmes of Action (NAPAs) for least developed countries (LDCs) and NAPs for developing countries. However, the importance of transboundary adaptation is increasingly recognised in national adaptation plans and actions. Though not yet defined under the UNFCCC nor by the Intergovernmental Panel on Climate Change (IPCC), transboundary adaptation can be understood as adaptation planning that addresses the dependencies and interdependencies from a systems perspective when assessing risk and when developing options to manage both the rapid and slow-onset impacts of climate change. Within UNCCD, it is recognised that the

3 UNCCD refers to 'landscape approaches' for land management/management of land degradation.

cross-sectoral nature of climate change, land degradation and desertification 'demands systems and integrated landscape approaches to assess vulnerability and adaptation capacities' (UNCCD, 2015).

Building on existing knowledge

Transboundary resource management is not a new concept. There is, though, a renewed opportunity to develop frameworks and response measures that build upon and learn from existing regulatory approaches in international environmental law, as well as the work of intergovernmental organisations, regional advocacy organisations and research programmes already dealing with transboundary resource management.

Regulatory approaches

Existing regulatory approaches to managing global and transboundary environmental problems include multilateral, regional and bilateral treaties, international customary law, and soft law instruments, such as memoranda of understanding.

In international law, environmental issues are generally framed either as 'common concerns of mankind' or 'transboundary' e.g. waterways (Birnie et al., 2009: 128). The 1992 Rio Conference on Environment and Development provided a framework for defining global responsibility for the environment, which it distinguished from regional or transboundary environmental responsibilities (Birnie et al., 2009). A particular feature of the Rio frameworks is the use of the phrase 'common concern' to designate those issues which involve global responsibilities (Birnie et al., 2009: 128). Several multilateral agreements include reference to 'common concerns'. For example, the preamble of the Rio Declaration urges 'new levels of cooperation' and a 'global partnership' to respond to global climate change (UN, 1992a). Other examples are the CBD, the Convention on the Law of Non-Navigational Uses of International Watercourses (commonly referred to as the UN Watercourses Convention), the Convention on the Law of the Sea, as well as Chapter 17 of Agenda 21 (UN, 1992b), which refers to the oceans, seas and coastal areas as 'an integrated whole that is an essential component of a global life-support system'. As such the designation 'common concern' points to a 'legal status both for climate change and biological resources which is distinct from the concepts of permanent sovereignty, common property, shared resources, or common heritage, which generally determine the international legal status of natural resources' (Birnie et al., 2009: 130). As noted, climate mitigation responses have thus been advocated for and advanced on the basis of 'common concerns'. In contrast, adaptation has been seen as a national concern and responsibility. However, developing response measures to manage issues with regional and global impact, such as land degradation, climate change and food security nexuses, requires a collective and systematic adaptation response if contagion of impacts due to maladaptation at the national level is to be avoided. Consequently, questions remain as to whether the increasing need for adaptation across borders will also become an issue of 'common concern'.

Another core element of international customary law that relates to transboundary impacts is the 'precautionary principle'. According to the Charter of the United Nations (UN), States have the right to exploit their own resources, but also the responsibility to ensure that activities within their jurisdiction or control do not result in environmental damage in other States or beyond the limits of their borders (UN, 1945: 6–8). The precautionary principle also enshrines the concept that States have a duty to 'cooperate in mitigating transboundary environmental risks and emergencies, through notification, consultation, negotiation' (Birnie et al., 2009: 137). This principle has been reaffirmed in subsequent international legal agreements, including the Rio Declaration on Environment and Development (Bankobeza, n.d.). Principle 15 of the Rio Declaration states that:

> *In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation* (UN, 1992a).

In relation to transboundary risk, Rio Principle 19 stipulates:

> *States shall provide prior and timely notification and relevant information to potentially affected States on activities that may have a significant adverse transboundary environmental effect and shall consult with those States at an early stage and in good faith* (UN, 1992a).

Certainly, the UNFCCC recalled principles inscribed in international law which endow States with the 'responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment or other States or of areas beyond the limits of national jurisdiction' (UN, 1992a).

An additional challenge to the applicability of international environmental agreements to transboundary adaptation is that adaptation is not only concerned with natural resources, but also involves human systems (Tompkins et al., 2010). It is unclear how legal principles

apply to national adaptation measures that States might implement domestically,[4] yet that unwittingly have a potential transboundary impact. In our increasingly globalised world, what are the global and transboundary implications of the adaptation choices of countries, particularly large producers and consumers? Countries must account for the interdependency of global supply and value chains, but where does responsibility for undertaking transboundary adaptation lie? These considerations are of increasing concern, as articulated by many countries in their INDCs, the documents which outline the actions that countries will take in order to achieve the global goals inscribed in the Paris Agreement.[5] A report synthesising the INDCs found that:

> *Transboundary issues with a global scope were reported. For instance, a few Parties highlighted that sectors of their economies, for example food production, contribute to ensuring global security, and one Party is studying the impacts of climate change on major food exporters in order to understand the risks to food imports* (UNFCCC, 2016d: 71).

Angola, for example, outlines regional adaptation as a priority, and one of its unconditional adaptation strategies (which is already funded) is enhancing resilience in the Benguela fisheries system, a project shared with Namibia and South Africa (UNFCCC, 2015). Such statements demonstrate the increasing identification of transboundary risks, and of approaches to managing and adapting them, as areas of 'common concern' that require cooperative adaptation actions. Post-2015, the issue of transboundary risk management and transboundary adaptive responses in the context of climate change seem to be gaining some traction.

The Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and the CBD and the UNCCD are examples of global legal frameworks – as well as bilateral and multilateral shared resource agreements (Bankobeza, n.d.). There are 145 agreements on transboundary water resources alone, including the Mekong, Jordan, Indus, Nile and Niger river basins.[6]

While regulatory approaches to transboundary resource management are well established for transboundary adaptation, key questions remain. Is 'adaptation across borders' also an issue of 'common concern' or transboundary in character? How does the precautionary principle – which does not 'prohibit' transboundary harm, but rather stresses 'prevention' of activities involving the risk of causing significant transboundary harm – apply to the development of a regulatory framework for formulating transboundary adaptation plans? Is current environmental law sufficient to address the character and needs of transboundary adaptation? Can existing transboundary agreements be revised to ensure climate change is addressed? These questions are beyond the scope of this Briefing Note, but provide food for further thought.

Institutional arrangements

There is also a range of institutions and commissions undertaking work on, or relevant to, transboundary adaptation. At the global level, there is the International Network of Basin Organizations (INBO), established in 2013. Among its objectives is promoting principles of good water management in the context of sustainable development (INBO, n.d.). Transboundary adaptation is a significant part of INBO's work. In the lead-up to the establishment of the Paris Agreement, it was a driving force behind the Paris Pact on Water and Adaptation to Climate Change (INBO, 2015). The UN Economic Commission for Europe (UNECE) has facilitated work on transboundary adaptation on water resources within its jurisdiction. In 2009 the UNECE prepared the ECE Guidance on Water and Adaptation to Climate Change (UNECE, 2009) and in 2015 a study of adaptation in transboundary basins was published (UNECE and INBO, 2015).

Given their vulnerability to climate change, among other drivers, transboundary water resources, particularly river basins, offer opportunities to learn about approaches. Water resources, such as rivers and lakes, have typically been managed via bilateral and regional treaties, of which there have been more than 2,000 since 1616 (O'Neil, 2009). Intergovernmental organisations, such as river basin commissions, can play an important role in the development of transboundary adaptation by sharing information and knowledge, identifying appropriate strategies and providing some of the critical resources needed (Heikkila et al., 2013).

The Mekong River Commission (MRC) is perhaps the best known example of a river basin organisation. The Mekong River flows from the Tibetan Plateau through the Yunnan province of China, then forms the boundary between Laos and Myanmar, and between Laos and Thailand. It then continues through Cambodia and the

4 Adaptation has been traditionally considered a national and subnational issue guided by national strategies, including NAPs and National Determined Contributions (NDCs).

5 Article 2 of the Paris Agreement outlines three primary ways in which the objective of strengthening the global response on climate change in the context of sustainable development will be achieved: (1) limiting global average temperature rise to well below 2°C and making a concerted effort to keep the global average temperature below 1.5°C, (2) increasing the ability to adapt and fostering resilience to climate change and low-carbon development in a way that does not negatively impact food production, and (3) ensuring that finance flows support pathways towards low-carbon and climate-resilient development.

6 See www.un.org/waterforlifedecade/transboundary_waters.shtml.

Mekong Basin (Nguyen, 2007). During the rainy season, a sea-level rise of one metre in the East China Sea can lead to flood levels of nearly two metres above current levels on the Mekong Delta (World Bank, 2011).

In Africa, some river basins are shared by as many as 10 countries, with several countries almost entirely dependent on water supplies that originate beyond their own borders

The Mekong Delta region is considered to be extremely vulnerable to climate change and its associated impacts.[7] Its transboundary nature means that climate change in the basin is both a national and a regional issue, and should be an integral part of the broader development agenda (Keskinen et al. 2010). Forming partnerships among countries of the region to develop common goals and commitments and share resources and knowledge to plan climate response strategies is essential. The Climate Change and Adaptation Initiative (CCAI) was created by the MRC in 2009 to increase understanding of current and future climate change impacts and to facilitate adaptation planning in the Lower Mekong Basin (MRC, 2011). Currently the MRC is developing the Mekong Strategy and Action Plan for the Lower Mekong Basin, which includes a strategic vision to identify priorities and strategies to support adaptation and build resilience (MRC, n.d.).

In Africa, some river basins are shared by as many as 10 countries, with several countries almost entirely dependent on water supplies that originate beyond their own borders (Chikozho, 2014). Mozambique shares nine river basins with other countries, most of which are upstream (Bankobeza, n.d.). The Africa Adaptation Initiative (AAI) is a continental initiative that addresses transboundary and regional adaptation. The AAI plans to develop regional projects on agriculture, water, oceans, ecosystems and infrastructure, with the aim of engaging all affected countries in projects with transboundary implications (AAI, 2016). The AAI already has political buy-in at the highest level from 54 African countries, having been mandated at a meeting of African heads of state in June 2015 (AU, 2015). As such, the AAI could be well placed to create opportunities for synergies between the UNFCCC and the transboundary conventions at policy and practice levels, and to provide guidance as to how to integrate adaptation into transboundary resource management. The AAI aims to help these countries to maintain coherence and synergies between national and transboundary adaptation and to enhance understanding of transboundary risk. This is important, as national plans will be impacted by regional-level adaptation, particularly in the case of shared water resources and movement of livestock.

Another example is The Great Green Wall for the Sahara and Sahel Initiative which was launched in 2007, with the aim of tackling land degradation in Africa (AU, 2016). This transboundary project, led by the African Union Commission, is being implemented in more than 20 countries across Africa's Sahel region, in cooperation with international partners including UNCCD, GEF, and the World Bank among others. Approximately $8 billion have been mobilised and/or promised for this initiative.

In the Himalayas, the International Centre for Integrated Mountain Development (ICIMOD) aims to help advance climate change adaptation efforts across borders in areas with similar climate impacts.[8] This includes facilitating access to data and information to support decision-making on adaptation. There are also examples of cross-border cooperation in conservation planning and management. Climate change is impacting the migratory patterns of wildlife all over the world (Trouwborst, 2012). In the Serengeti National Park-Maasai Mara National Reserve, transboundary conservation migration areas have been created for wildlife habitats of migratory species that occupy two or more countries.

Research and academic institutions are also endeavouring to better understand transboundary adaptation. The Stockholm Environment Institute (SEI) has undertaken a project – Adaptation Without Borders – to better understand the indirect impacts of climate change and how they can be addressed (WeADAPT, n.d.). The premise behind Adaptation Without Borders is that, given transboundary risks, no adaptation strategies are purely local. The aim of the project, which began in 2015 and will conclude in 2017 is to increase awareness of the transboundary aspects of climate risks and to develop tools that will support decision-makers in addressing these risks (Davis, 2015). Research within the project suggests that there are four main pathways of indirect climate risks and has produced proposals as to how some of these risks could be addressed through NAPs. The Collaborative Adaptation Research Initiative in Africa and Asia (CARIAA) is a seven-year research project which focuses on regional climate hotspots and shares lessons learned from regional research, with the goal of informing adaptation planning in regions that are most vulnerable to

7 Apart from floods, climate change impact may also lead to a decrease in annual rainfall and average humidity. An increase in temperature can lead to reduced amounts of snow accumulation in the upstream reaches of the Mekong River in the Tibetan Plateau. This, together with human impacts such as deforestation, agriculture, and hydropower projects on the upper reaches of the Mekong River, will have further impact on the hydrological regime of the Tien and Hau Rivers, and consequently on the livelihoods of millions of people (Chivanno et al., 2008; Eastham et al., 2008).

8 See www.icimod.org/?q=16901.

climate change (Cochrane et al., 2016). One of the early findings of CARIAA is the need to find innovative ways to ensure that research is strong and that it also supports decision-making (Cochrane et al., 2016).

Moving up the agenda: opportunities for transboundary adaptation in the UNFCCC

As we have seen, the UNFCCC is by no means the only convention relevant for transboundary adaptation, and is in fact one of the weakest in this regard. However, the UNFCCC will be central to furthering the dialogue, policy processes and resourcing required for transboundary adaptation measures to be effectively implemented where they are most urgently needed. While the UNFCCC does not define transboundary adaptation (nor indeed adaptation), it has acknowledged the importance of transboundary adaptation as a possible response measure. The Cancun Agreements, which established the Cancun Adaptation Framework,[9] make several references to the importance of enhancing adaptation at the regional level, including the importance of ensuring that developing countries have support to implement adaptation actions at all levels (UNFCCC, 2011).

In recent years, discussions under the Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change (NWP) have highlighted the importance of transboundary adaptation – most prominently in water resources.[10] While it does not appear that these have been taken any further, there is significant scope for enhancing work on transboundary adaptation under the UNFCCC, and particularly the guidance of the Adaptation Committee and through the development and formulation of NAPs.

The current three-year workplan of the Adaptation Committee will be implemented from early 2016 through to the end of 2018 (UNFCCC, 2016e). The Committee agreed to maintain flexibility to allow for the inclusion of relevant aspects of the Paris Agreement, including the GGA. Given this, there are several areas where a focus on transboundary adaptation could be added or enhanced, including strengthening engagement with institutions working on transboundary adaptation; providing technical support to countries undertaking transboundary adaptation; providing guidance on accessing technical support for the development of strategies and raising awareness; and facilitating the exchange of information on transboundary adaptation. The Adaptation Committee could also provide guidance for the assessment of indirect impacts of climate change and how these can be addressed (SEI, 2014).

While NAPs are national plans, the prevalence of transboundary or shared resources makes transboundary adaptation planning critical. The guidance on NAPs prepared by the UNFCCC encourages countries to establish links between the national, regional and international levels (SEI, 2014). The guidance includes assessing vulnerability and identifying adaptation options, noting that this should be done at all appropriate levels (SEI, 2014). The NAPs could be a platform for enhancing transboundary cooperation on adaptation with guidance from the UNFCCC, in particular from the Adaptation Committee. The NAP Task Force under the Adaptation Committee could also provide targeted support to countries on the integration of transboundary adaptation into their NAPs. Specific support to LDCs could be provided through the NAP Global Support Programme, a joint initiative between the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) to provide assistance to LDCs for developing NAPs with funding from the Least Developed Country Fund. The regional training workshops on the NAPs could include an increased focus on transboundary adaptation and facilitate discussions on how to enhance transboundary cooperation within each region.

Some countries have already recognised the importance of addressing the indirect impacts of climate change within their national policies. In its national adaptation framework, Nauru recognises high economic dependency on a few sectors as key drivers of vulnerability (SEI, 2014). SEI's Adaptation Without Borders proposes four pathways of indirect climate risk: people (migration and health impacts); biophysical impacts on the flow of ecosystem services or resources; trade (altered price, availability or quality of goods and services); and finance (changes in the flow of capital from outside a country). The project suggests that all countries should include both global and transboundary dimensions of vulnerability and adaptation options in their NAPs, with the aim of identifying indirect impacts that are of specific concern, and articulating how climate change impacts within its borders could create indirect impacts for other countries. NAPs could identify the opportunities and potential vehicles for enhancing global and regional cooperation to address indirect impacts of climate change, including through transboundary adaptation (SEI, 2014). Sharing drafts of NAPs with neighbouring countries could provide

9 The Cancun Adaptation Framework (CAF) was established at the 16th Conference of the Parties in Cancun, Mexico, in 2010. The objective of the CAF is to enhance action on adaptation, including through global cooperation and enhanced coherence on adaptation under the Convention. The CAF invited all countries to enhance action on adaptation in the light of common but differentiated responsibilities and differing capabilities and national and regional priorities. The Adaptation Committee, the oversight body for adaptation under the UNFCCC, and the process for developing and implementing NAPs were established as part of the CAF (UNFCCC, 2011).

10 The NWP is a work programme under the UNFCCC which aims to help countries, particularly developing countries, enhance both the understanding of and the assessment of climate change impacts, vulnerability and adaptation strategies to support decision-making on practical adaptation actions and measures to address climate change.

opportunities for shared learning and the co-development of solutions (SEI, 2014).

Though the term 'transboundary adaptation' has yet to be acknowledged in a UNFCCC decision, there are provisions relevant to it throughout the Paris Agreement. The Paris Committee on Capacity-Building (PCCB) was established to address capacity-building gaps and needs and enhance capacity-building efforts under the Convention (UNFCCC, 2016a; 2016b). One of the activities in the 2016–2020 PCCB workplan is to foster global, regional, national and subnational cooperation (UNFCCC, 2016a; 2016b). Building capacity to support transboundary adaptation should therefore be a key component of these discussions.

The Paris Agreement also established a technical examination process on adaptation (TEP-A), which aims to identify opportunities for strengthening resilience, reducing vulnerabilities and enhancing both the understanding of, and the implementation of, adaptation action (UNFCCC, 2016c). The first of the TEP-A's annual technical expert meetings (TEMs), held in 2016, included a session dedicated to enhancing understanding of the challenges and opportunities associated with transboundary adaptation. The technical report from the TEMs included several relevant conclusions, for example the importance of coordinated action to reducing vulnerability (UNFCCC, 2016c). While it is important that transboundary adaptation is being recognised, these conclusions could be actioned through further work under the aegis of the UNFCCC. There is a process underway to profile the key messages from the TEMs at an annual high-level event to be held in conjunction with each Conference of the Parties. This event will engage with high-level policy and decision-makers and could become a platform to catalyse transboundary action on adaptation.

Certainly, the Paris Agreement has the potential to further enhance the narrative on transboundary adaptation, especially in relation to the GGA. Established to enhance adaptive capacity, strengthen resilience and reduce vulnerability to climate change, the GGA strengthens the ability of the parties to adapt and facilitate resilience to climate change impacts, which is now one of the overarching goals of the Agreement, alongside efforts to keep the global average temperature increase to well below 2°C and warming below 1.5°C (UNFCCC, 2016c).

While the Paris Agreement does not refer specifically to transboundary adaptation, it recognises that adaptation is a global challenge with local, subnational, national, regional and international dimensions (UNFCCC, 2016a). Decision 1/CP.21, which accompanies the Agreement, asks Parties to strengthen regional cooperation on adaptation and, where appropriate, to establish regional centres and networks, particularly in developing countries (UNFCCC, 2016a).

Parties to the Paris Agreement will need to report on their progress towards achieving the GGA in the Global Stocktake, the process for assessing the progress towards achieving the global goals. Given that some countries have already highlighted transboundary adaptation in their INDCs, there is significant scope to include such efforts in country reports. Discussions on the operationalisation of the GGA must also focus on increasing transboundary adaptation.

Challenges, opportunities and the way to action

It would be naive to suggest that developing transboundary adaptation is not without significant legal, political and practical challenges. Adaptation policy and planning at national, local and sector levels is already challenging. Undertaking transboundary vulnerability and risk assessments is complex, resource-intensive and difficult to integrate, and developing transboundary adaptation strategies poses an even greater challenge.

At a 2012 NWP in Mexico City, workshop discussions highlighted some of these challenges, many of which are already inherent in national adaptation planning processes (Elrawady and Koeppel, 2012). The workshop identified lack of data-sharing and availability, weak joint data-management, inadequate observational networks, lack of consensus on adaptation priorities, and an absence of coordination mechanisms on climate finance for transboundary adaptation. The continued focus on national-level adaptation was also mentioned as a challenge, as were the lack of flexibility in existing transboundary risk management agreements and, perhaps most obviously, fundamental political barriers, such as questions of sovereignty, jurisdiction and responsibility, as well as lack of political will. The 2016 TEMs on adaptation under the UNFCCC highlighted the importance of ensuring that risk and vulnerability assessments incorporate relevant transboundary aspects, such as shared river basins and the repercussions of global food security, on the vulnerability of national agricultural and livestock production (UNFCCC, 2016c). Certainly, there is a disconnection between policy and practice.

But, as well as challenges, there are also several opportunities to better support transboundary adaptation efforts. For example, transboundary cooperation could also support adaptation efforts at the national level by strengthening the capacity to develop and implement adaptation plans; enhancing knowledge on adaptation by pooling regional expertise; sharing costs for activities like developing climate change scenarios; and avoiding negative transboundary impacts, particularly in shared river basins and other ecosystems (UNFCCC, 2016c). Moreover, the knowledge being generated by the NWP and the TEP-A, among others, should be incorporated into the official fora, and particularly into the work on adaptation under the UNFCCC. There is also a need for economic incentives to enable joint adaptation planning and engagement of the private sector to finance transboundary adaptation. If countries could be confident

that transboundary risk was being addressed through a suite of regionally agreed adaptation measures, this could provide confidence in terms of de-risking investments involving shared resources. Indeed, finance is a significant issue. One way of addressing the challenges could be to establish a formal working and technical advisory group under the UNFCCC. This could then explore mechanisms for facilitating cooperation and coordination between transboundary initiatives and NAPs. This group could also work more formally with existing intergovernmental institutions, such as river commissions, to ensure climate change is addressed in existing transboundary agreements, as well as with regional centres, such as ICIMOD and AAI, to build capacity and knowledge exchange in specific areas of concern, as highlighted by Parties to the Paris Agreement.

There is a lot of ongoing work on transboundary adaptation, particularly, though not limited to, water resources. The INBO incorporates a plethora of basin organisations throughout the world. As discussed, there are many other institutions facilitating cooperation on the management of transboundary resources. This work will become increasingly important as the impacts of climate change increase.

The impacts of climate change will cross boundaries, necessitating both bilateral and, in some cases, multilateral cooperation (Magnan et al., 2015). The Paris Agreement has recognised that adaptation is a global challenge faced by all, and with local, subnational, national, regional and international dimensions (UNFCCC, 2016a). It is now time to move beyond recognition and towards action to support transboundary adaptation. The GGA is one way of ensuring that the many aspects of adaptation – including the geographic and thematic dimensions – are addressed. But while many Parties and groups have indicated that operationalising the GGA should be one of the purposes of the adaptation communications, this has yet to be discussed. It is important that a shared understanding of the GGA be developed to track progress on adaptation (Magnan et al., 2015). The UNFCCC could play a critical role in supporting transboundary adaptation by encouraging countries to provide information and preparing an annual report on transboundary risks and adaptation (Magnan et al., 2015). More specifically, the Adaptation Committee could include transboundary adaptation in its current workplan, and its NAPs Task Force could provide support to countries wishing to integrate transboundary adaptation into their NAPs. The regional training workshops on the NAPs could include sessions dedicated to the transboundary issues in each region.

If Parties include transboundary adaptation in their adaptation communications, then these elements would need to be included in the Global Stocktake. Current discussions under the Ad hoc Working Group on the Paris Agreement (APA), the body under which the implementation of the Paris Agreement is being negotiated, are focused on the details of what will be included in these documents, but not necessarily on the practical elements of how to ensure that an overarching vision on adaptation is achieved. However, there is a clear and increasing need for transboundary adaptation planning, particularly as climate change impacts water resources and other transboundary ecosystems.

More discussions are needed to bring the adaptation-relevant elements of the Paris Agreement together, and particularly on how to support countries in their transboundary and regional adaptation efforts. Moreover, developing synergies and coherence between other conventions, such as the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention), the CBD and the UNCCD, will be essential to build on lessons learned and to develop comprehensive policy, legislative and needs-based approaches.

Developing robust climate adaptation measures is complex. Devising policies and identifying options must take place in the context of changing physical, socioeconomic and political conditions in which uncertainties are inherent and systemic adjustments required (Moss and Martin, 2012). Ecosystems, and therefore the climate change impacts that affect them, do not stop at state borders. To respond to these impacts as they traverse political and geographical boundaries, and to meet the demands of our increasingly globalised and interdependent world, will necessitate developing new approaches that address the concerns of countries grappling with understanding transboundary risk and risk management.

Mazenod resevoir under construction, Lesotho. Photo credit: John Hogg/World Bank, 2009. CC BY-ND 2.0.

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Acknowledgements

We would like to thank Chukwudi Onike and Kevin O'Neill (the Rockefeller Foundation), John Twigg (ODI) and Richard Klein (Stockholm Environment Institute) for their helpful feedback and support. With thanks also to Katherine Shaw, Anna Hickman and Caelin Robinson for copy-editing, design and communications support.

Notes

This briefing note was prepared with support from The Rockefeller Foundation as part of ODI's Resilience Scan initiative, and is an excerpt from *Resilience Scan: April–June 2017*. For the full text and references, please visit www.odi.org/publications/10960-resilience-scan-april-june-2017. The paper's findings and conclusions are those of the authors and do not necessarily reflect the positions or policies of The Rockefeller Foundation.

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