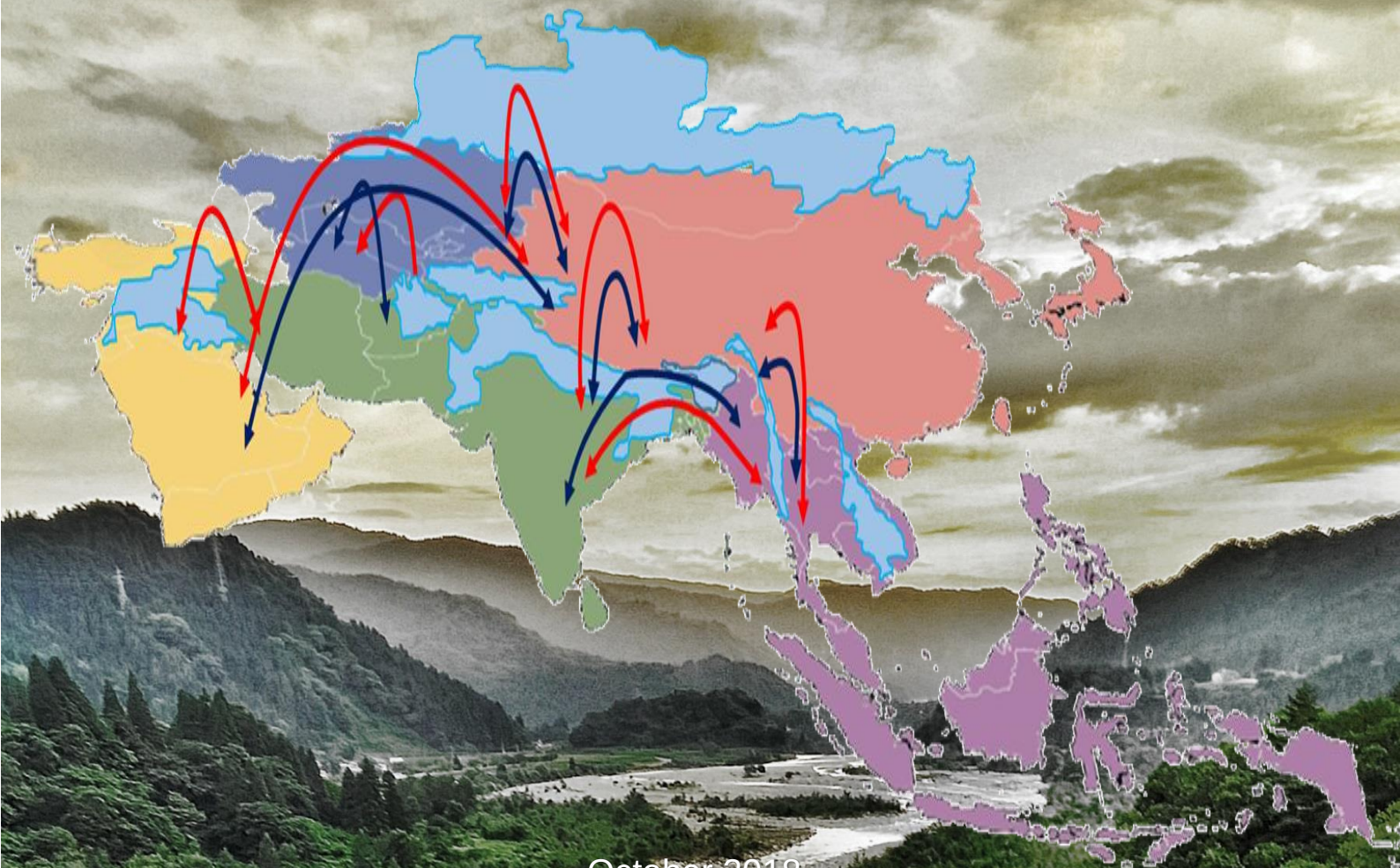
IGES-GDN Discussion Paper

TRANSBOUNDARY IMPACTS OF CLIMATE CHANGE IN ASIA: MAKING A CASE FOR REGIONAL ADAPTATION PLANNING AND COOPERATION



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Institute for Global Environmental Strategies, Hayama, Japan
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TRANSBOUNDARY IMPACTS OF CLIMATE CHANGE IN ASIA: MAKING A CASE FOR REGIONAL ADAPTATION PLANNING AND COOPERATION

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Discussion Paper

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Abbreviations

ACCI	ASEAN Climate Change Initiative
AMS	ASEAN Member States
APAN	Asia Pacific Adaptation Network
ASEAN	Association of Southeast Asian Nations
ASSC	ASEAN Socio-Cultural Community

AWGCC	ASEAN Working Group on Climate Change
BAU	Business as usual
COP	Conference of Parties
GCF	Green Climate Fund
GDP	Gross domestic product
GLOF	Glacier lake outburst flooding
GTI	Great Transition Initiative
HEC-HMS	Hydrologic Engineering Center Hydrological Modelling System
HKH	Hindu Kush Himalaya
HYCOS	Hydrological Cycle Observing System
ICIMOD	International Center for Integrated Mountain Development
INDCs	Intended Nationally Determined Contributions
KSLCDI	Kailash Sacred Landscape Conservation and Development Initiative
LDC	Least developed countries
MASAP	Mekong Adaptation Strategy and Action Plan
MP	Mountain Partnership
MRC	Mekong River Commission
NAP	National adaptation plans
NDC	Nationally Determined Contributions
RCP	Representative Concentration Pathways
RFIS	Regional flood information system
SAARC	South Asian Association for Regional Cooperation
SADKN	South Asia Disaster Knowledge Network
SANDEE	South Asian Network for Development and Environmental Economics
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
WMO	World Meteorological Organization

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Summary

Teleconnections[1], including between transboundary natural resources and their ecosystem services, economic linkages through trade and social linkages in terms of human mobility, are prevalent among the sub-regions of Asia. Home to vast transboundary natural resources, the region is dependent on these resources for the wellbeing of its societies and countries. In addition to resource flows, the region is becoming increasingly integrated with growing trade and movement of people during recent decades; these linkages are projected to grow in the years to come. Climate change has an impact on many of these teleconnections and can have significant implications on the way countries respond to climate change threats, if it is not understood and addressed well.

The available knowledge on projected climate change impacts on transboundary natural resources and related teleconnections is insufficient, and national adaptation planning processes are largely unaware of the impacts of climate change on sub-regional and regional teleconnections. As a result, ongoing adaptation efforts may not be able to achieve full and effective adaptation outcomes. There are serious gaps in terms of poor development of governance of common resources, lack of reliable estimates on how and to what extent countries are benefiting from these resources, as well as what impact climate change has on these resources on which individual countries depend.

There is a clear lack of recognition of climate change impacts on transboundary natural resources in the international climate change regime and related processes. Regional adaptation planning provides an important opportunity to address the current gaps in adaptation planning. It can help initiate efforts to identify and quantify the impacts of climate change on regional and sub-regional teleconnections, and mainstream solutions into national and subnational adaptation planning. There is an increasing consensus among international organizations that such regional adaptation planning should be a priority to fill important gaps in the current discourse on adaptation planning.

Regional and sub-regional cooperation is an imperative for putting in place regional adaptation planning processes. Such cooperation should be able to recognize sub-regional diversities and differences in country priorities, while being able to identify opportunities to collaborate and design interventions that address common threats. Financing regional initiatives such as regional adaptation planning and cooperation is a challenge given that much adaptation finance is linked to country-specific programming by many bi- and multi-lateral development agencies. Hence, innovative means of designing programs need to be promoted under a regional cooperation mechanism by clearly attributing the consequences of climate change impacts on teleconnections. The benefits of interventions would be identified and attributed to individual countries to justify the funding to the regional adaptation and cooperation mechanism.

[1] The word ‘teleconnections’ in this report has been used to imply all those direct and indirect connections between causes and effects separated by geographical distance in their occurrence and shouldn’t be confused with the context in which the word is used in atmospheric sciences.

TRANSBOUNDARY IMPACTS OF CLIMATE CHANGE IN ASIA: MAKING A CASE FOR REGIONAL ADAPTATION PLANNING AND COOPERATION

1. Introduction

Climate change impacts are being felt at global, regional, national and local levels. The consequences of these impacts exacerbate transboundary issues, and need to be addressed through strategies at international and regional scales that can translate into national and local actions.

As a way to support developing and least developed countries to design robust adaptation strategies, policies and plans, the United Nations Framework Convention on Climate Change (UNFCCC) established the national adaptation plans (NAP) process as a way to facilitate adaptation planning. As a result, many countries have started putting in place mechanisms for national adaptation planning. While many of these national adaptation plans are national-centric, as they are expected to be, they largely miss out on the regional implications of climate change and co-benefits of joint action. Adaptation is seen as a local problem, and this perception has been holding back the discussion on the need to elevate adaptation planning beyond national boundaries (Benzie, et al. 2018). Climate change consequences within country borders are to be addressed by the existing policy and institutional mechanisms, as they fall within the administrative and policy jurisdiction of each individual country. However, the focus on national adaptation planning has meant that cross-boundary consequences of climate change, and the co-benefits that come as a result of regional level action and cooperation, are not sufficiently included in adaptation planning.

There are at least four risk pathways through which climate change impacts cross national borders: biophysical, trade, people, and finance (Benzie, et al. 2018). The resultant regional implications of climate change could include, for example, key impacts to physical and biological systems such as shared natural resources (transboundary rivers and other waterbodies, glaciers, wetlands, protected ecosystems, forests, migratory species etc.). Other regional implications include alteration of temperature, air currents, ocean systems and hydrological flows, causing large-scale disaster events that could simultaneously affect several countries through monsoon floods, typhoons, glacier lake outburst flooding (GLOF) in the Himalayas, and droughts etc. Climate change also impacts the socio-economic systems of countries and this affects other countries that they interact with. The impacts could include migration of people across borders, with people fleeing the socio-economic hardships caused by climate change. Impacts on crops and natural resources and related products in one country could have large effects on neighboring and even distant countries. The impacts on trade pathways could disrupt food prices, quality and availability of goods and services in international markets, and supply chains. Similarly, financial flow in the form of investments, import and export payments, and remittances could also be negatively impacted.

To address transboundary adaptation challenges, there is a need to a) assess climate change impacts in terms of their transboundary implications for individual countries in a regional context, and b) put in place a regional cooperation mechanism that helps countries to discuss and establish appropriate strategies to address transboundary impacts of climate change within their national and sub-national adaptation planning.

Regional cooperation is needed to consider the transboundary risk implications of NAPs and nationally determined contributions (NDCs) under the Paris Agreement (Nadin and Roberts 2018). Promoting a regional adaptation planning mechanism will be instrumental to not only tackle transboundary impacts of climate change, but also to harvest the opportunities that climate change may bring. For example, regional cooperation could help countries to:

a) Pool expertise, knowledge, and experiences at the regional level, allowing countries to benefit from resource-sharing and more defined collaboration frameworks from countries facing similar climate impacts;
b) Minimize trade-offs emerging from the planning and implementation of NAPs and NDCs that generate transboundary risks (Nadin and Roberts 2018);
c) Pool financial and technical resources, promoting self-help in the form of a regional support mechanism;
d) Access international financial and technical resources in a more coordinated manner based on adaption gaps requiring transboundary co-operation that have been identified;
e) Complement adaptation communication and transparency frameworks under the Paris Agreement through a joint regional stocktaking process.

Such regional level collaboration would help build trust and confidence among countries and complement their efforts on effective communication on financial, technological, or capacity-building supports. Understanding and prioritizing the transboundary dimension is critical to ensure that international cooperation is targeted towards achieving the global goal on adaptation under the Paris Agreement (Benzie, et al. 2018).

Regions such as South Asia, Hindu Kush Himalaya (HKH) and Southeast Asia hold a large number of least developed countries and huge concentrations of vulnerable peoples. These regions are also likely to experience serious transboundary impacts of climate change due to shared natural resource reserves, including waters from the Himalayas. At the same time regional integration is increasing the linkages between countries on trade and investment, finance, infrastructure, connectivity, movement, socio-cultural integration and settlements of people across borders (ADB 2017). Hence, regional thinking in adaptation planning will provide large benefits for climate risk-proofing in these countries and regions. A comprehensive approach to adaptation planning will address both those issues that fall within the purview of individual countries and address those issues that require regional cooperation under existing or new regional mechanisms (see Figure 1).

International and regional mechanisms have been put in place to assist countries in managing transboundary natural resources and adaptation planning. Nevertheless, there are very few international treaties, laws and conventions that are directly related to addressing the issues related to transboundary natural resources. Many of these conventions and laws do not either well recognize climate change or are independent of the actions taken in response to climate change.

In terms of climate change adaptation planning, support is being provided by several international and regional stakeholders through modalities such as technical advice, papers and guidelines, workshops, training activities and expert meetings, syntheses of experiences, best practices and lessons learned, as well as regional exchanges and cooperation. However, these support mechanisms mostly do not address the regional implications of climate change.

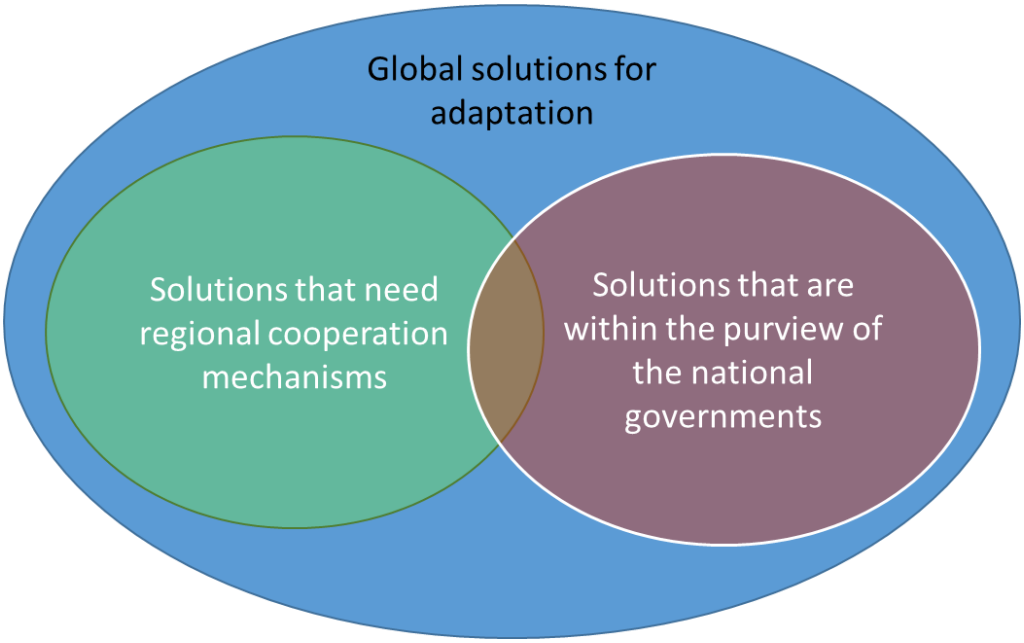

Figure 1. Taxonomy of solutions for climate change adaptation in a regional context

(Source: Authors)

Some regions, such as ASEAN, have made progress towards regional collaboration on adaptation. This contributes to a) harnessing regional capacities and resources for pushing forward otherwise sluggish national adaptation planning and implementation processes, b) attracting global financial resources through initiating capacity-building measures to tap such global resources, c) developing common approaches including developing guidelines and tools for adaptation decision-making that better reflect country contexts than resources developed outside the region, and d) enhancing regional integration by promoting resilience. Other neighbouring regions, like South Asia and the HKH, can learn from and improving upon the achievements of ASEAN on collaboration on adaptation.

Keeping the above context in view, this discussion paper lays out three individual sub-regional cases in terms of how these sub-regions can benefit from regional cooperation. It also distils messages on how regional cooperation can be strengthened to effectively address the transboundary impacts of climate change through initiating regional adaptation planning processes in Asia.

2. Asia Sub-regional Contexts Demanding Regional Adaptation Planning and Cooperation

Asia is becoming increasingly integrated in terms of trade, movement of people, and natural resource dependence (see Figure 2). Asia accommodates 57 transboundary river basins, the majority of which are not governed under any treaty or basin agreements, accounting for nearly 39% of the continent's surface area (UN Water Courses Convention 2018). The majority of these river basins are under severe development and climate change related pressures. The trade across sub-regions of Asia rose by 20% during the past decade, Southeast Asia accounted for the biggest share of regional trade at 31%, followed by South Asia (24%) and Central and West Asia (20%) (ADB 2018). In addition, human mobility in the region has been on the rise due to economic opportunities, disasters and internal security issues (ADB 2018).

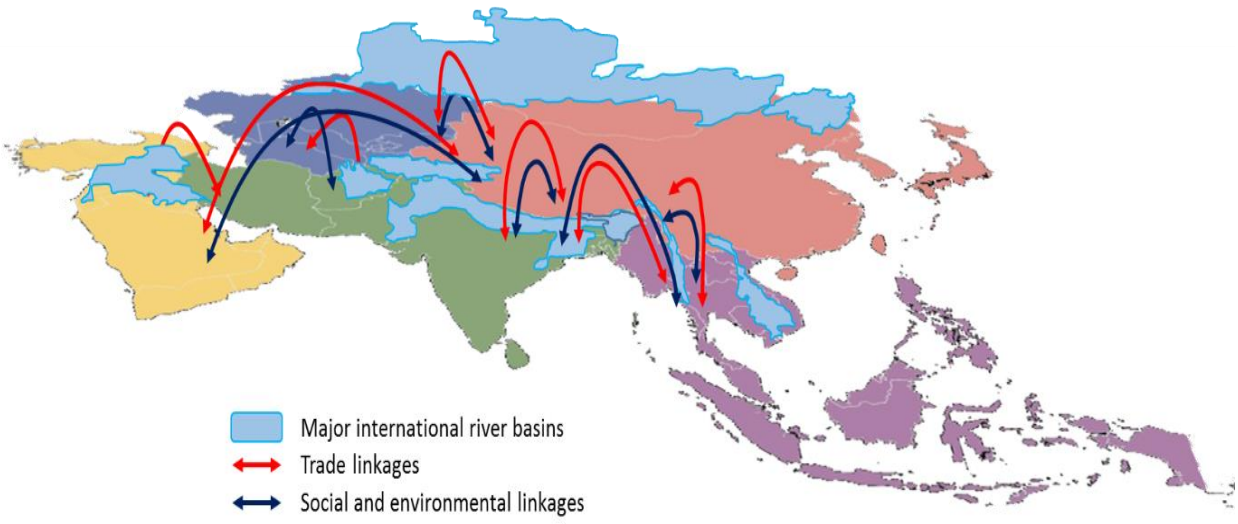

Figure 2. Tele-connections among sub-regions of Asia that could be significantly impacted by climate change

(Source: Authors)

One of the most important features of migration in Asia is "its intraregional and sub-regional nature" (Chanda 2012). This is evident in the movement of people between South Asia, Southeast Asia and the HKH sub-region. Rabbani et al. (2016) identified that current population movements are driven by economic and social factors. Chanda (2012) identified, for example, that India and Pakistan serve as destination markets for migrant workers from Nepal, Bangladesh, Myanmar, and Afghanistan. Malaysia, Singapore, and Thailand. These are considered important destination markets for countries in South and South East Asia, such as Bangladesh, India, the Philippines, and Indonesia. In addition to migration for employment, climate change and environmental factors will have a significant impact on migratory flows in the future in these regions (Rabbani et al. 2016). The Internal Displacement Monitoring Centre (2015) estimates that 7.9 million people were displaced in South Asia due to disasters in 2015, accounting for 36% of the total global displacement of that year. Furthermore, in 2017, around 8.6 million people in East Asia and the Pacific and 2.8 million in South Asia fled within their own countries to escape the impacts of sudden-onset disasters (Fuller 2018).

As a result of the teleconnections between countries, climate change impacts in one part of the region are increasingly being felt in other parts of the region. While the importance of linkages between countries are recognized in various policy processes promoting regional cooperation and integration (e.g. South Asian Association for Regional Cooperation, Association of Southeast Asian Nations etc.), the impact of climate change on these linkages is not yet fully recognized and is not being adequately addressed in the ongoing discourse on climate change adaptation planning.

2.1 South Asia

2.1.1 Transboundary impacts of climate change

South Asian countries share important natural resources, especially water. Siwakoti (2011) identified that trans-national river systems, such as the Indus, the Ganges and the Brahmaputra, are inextricably linked to regional geopolitics. For example, the Indus basin consists of six major rivers and connects China, Afghanistan, Pakistan and India. The Greater Ganga Basin connects with the Brahmaputra through areas in China, Bhutan, India, Nepal and Bangladesh. Uprety and Salman (2011) observed that the development of cooperation among Bangladesh, India, Nepal and Pakistan with respect to the Indus and the Ganges-Brahmaputra-Meghna river basins has been a cause of tension in the region: “India has been involved in military conflict with China and Pakistan and water-related tensions with Pakistan and Bangladesh (Siwakoti 2011).”

Climate change direct impacts in South Asia are likely to be numerous and multifaceted. They extend to the sharing and management of transboundary waters in South Asia. Uprety and Salman (2011) rightly stated that “problems of water sharing and management of water resources in South Asia have become even more complex because of the region's extreme vulnerability to the consequences of climate change.”

The impacts of climate change are cross-border in nature. The World Bank (2009) identified that many of the most severe climate change impacts in South Asia are likely to be regional, and will only be addressed through common efforts between neighbouring countries via regional cooperation. Rasul (2014) identified that “floods in China can affect hydropower stations in Nepal; erosion in one country deposits sediment in another; and hydropower potential in one country serves markets in another.” Regional thinking and cooperation on adaptation, taking into account the transboundary nature of the region’s ecosystems and rivers, would strengthen the assessment of major national and regional vulnerabilities to climate, and support the prioritizing of common adaptation activities.

One of the main transboundary impacts of climate change in South Asia is related to water. Specifically, this includes future water availability, water supply, demand and quality, and hydrological events. The region has only 4.6% of the world’s renewable water resource with 23.7% of the global population (Hirji, Nicol and Davis 2017). Climate change consequences will likely exacerbate regional tensions over water resources (Price 2016).

Access to water is directly dependent on glacial melting and rainfall. In South Asia, climate change is impacting glacial hydrology with wider implications upon water resources within the Indus, Ganges, and Brahmaputra basins (Miller, Immerzeel and Rees 2012, Wade

2016). Glacial retreat and the actions of upstream countries have direct implications for downstream communities and river flows (Price 2016, Dorji 2012) (see discussion on the HKH region). Additionally, variability in monsoons, droughts and sea-level rise (five countries in the region have coastlines and are thus directly exposed to this), will directly influence water availability in cities and towns. These changes will also affect agricultural and livestock production, and hence food security. Most aspects of life and the economy will not escape these transboundary impacts of climate change.

Extreme future heat waves and warming temperatures are other important transboundary issues in the region. Currently, average weather patterns are changing, following a general pattern of warming. According to World Bank (2018), rising temperatures and more erratic rainfalls are affecting (and will continue affecting) eight hundred million people (half the region's population), who are "at risk to see their standards of living and incomes decline as rising temperatures will cut down crop yields, make water more scare, and push more people away from their homes to seek safer places." Im et al. (2017) projected that under the current scenario, at least 4% of the population in the region will experience temperature and humidity conditions by 2100 in which air conditioning becomes an absolute necessity. Regional cooperation is needed for effective responses to the consequences and impacts of future heat waves and warming temperatures.

Additionally, South Asia is a hotspot for natural disasters, accounting for some 40% of the global events related to recorded floods, sedimentation, droughts, storms, and landslides. These types of disasters cause loss of lives and livelihoods, and damage property and infrastructure. Economic damage and losses projected under a business as usual (BAU) scenario with the current climate change trends are very significant in South Asia. Ahmed and Suphachalasai (2014) estimated that the region could lose an equivalent 1.8% of its annual gross domestic product (GDP) by 2050, with an increase to 8.8% by 2100. In addition, climate change will also slow down the growth rate of food production with crop yields declining to as much as 30% by 2050 without changes in practices (Rasul 2014).

2.1.2 Existing mechanisms to address impacts

The South Asian Association for Regional Cooperation (SAARC) was established on 8 December 1985 aiming, amongst other objectives, to promote collaboration and assistance in the economic, social, cultural, technical and scientific fields, as well as strengthen cooperation among the eight Member States (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka) on matters of common interests (University of Calicut 2011).

Member countries have continuously reiterated the need to strengthen and intensify regional cooperation on issues related to the preservation and protection of the environment including disaster risk reduction and the need to address the challenges posed by climate change. Regional Centers have been established by the SAARC to encourage the protection, conservation and prudent use of environment resources through research, education and coordination among member states (SAARC Environment Center), and to provide policy advice, facilitate capacity building and exchange of information for effective disaster risk reduction and management (SAARC Disaster Management Center).

As an effort to pool knowledge from the global and local research communities, the South Asia Disaster Knowledge Network (SADKN) was created to target support for the development of detailed regional assessments of vulnerabilities and longer-term threats from climate change (Gokarn 2014). The SADKN shares knowledge and information among multiple stakeholders on various issues of disaster risk reduction.

In terms of channelling international funding for adaptation, according to Ahmed & Suphachalasai (2014), some countries in the region already have notable funding mechanisms between central government and local authorities which strengthen local capacity for adaptation planning and for implementing local and autonomous adaptation actions. Efforts are now required at a regional level to build capacity to make the best use of existing and potential funding resources. This can be achieved by improving the dissemination of information and by providing technical assistance for climate change programs and actions (Ahmed & Suphachalasa 2014).

2.1.3 Gaps to fill

It is necessary to strengthen coordination between upstream and downstream countries (Rasul 2014) setting a long-term shared vision towards mitigation and adaptation to climate change. The most severe climate threats in the region transcend national boundaries. Finding effective solutions will require not just local action, but also cross-boundary cooperation between upper and lower riparian countries (World Bank 2009). It is necessary to develop a regional institutional structure that can contribute to the assessment of threats and aid in designing response strategies (Gokarn 2014). Coordinated approaches through partnerships and regional collaboration provide a cost-effective way of adapting to regional climate-related risks, as well as assisting in lowering emissions. They can also support the sharing of the benefits of mitigation and adaptation measures (Price 2016).

Additionally, the region can make efforts to improve cooperation in relation to disasters (Price 2016). In 2017, the monsoon in South Asia left nearly 1,400 people dead and displaced millions of others (World Bank 2018). As opined by Coloff et al. (2017) and Vij et al. (2017), in South Asia oftentimes climate policies emphasize technical solutions to address and control disasters, which in the long-term may lead to mal-adaptation. Cooperative actions could encourage alternative policy approaches with a long-term view, steering away from malpractices by emphasizing the importance of flexibility and scale (Vij et al., 2017).

Regional cooperation to address common threats could also encourage the development of more practical collaborative structural and non-structural projects related to flood preventive measures, flood control, irrigation, and river transport, especially in the Ganges-Brahmaputra-Meghna basins (Priya, et al. 2017).

To summarize, regional cooperation on adaptation is needed for sharing knowledge and best practices, developing new innovative partnerships to adapt to and better cope with regional climate-related risks, exchanging experiences, information and technology to assist

in lowering emissions, as well as encouraging the development of more practical collaborative structural and non-structural adaptation projects.

2.2 Southeast Asia

2.2.1 Transboundary impacts of climate change

Southeast Asia has a bounty of transboundary natural resources that are crucial to its national economies. Some of the important transboundary natural resources include rivers (e.g. the Mekong River, Red River, and Irrawaddy River), vast stretches of forests, wetlands, coastal ecosystems and mangroves that provide diverse ecosystem services across boundaries, and shared oceans that provide economic benefits to the countries in terms of fisheries, energy and transportation. Southeast Asia has been identified as one of the richest biodiversity regions in the world (Daming, et al. 2014) providing ecosystem services worth USD 6.7 trillion (Kubiszewski, et al. 2016), a significant part of which provide transboundary benefits to countries in the region.

Southeast Asian countries are highly exposed to climate change impacts. The region has observed a temperature rise of 0.14-0.2^{o}C in the past five decades and the projections indicate a temperature raise of more than 3^{o}C by the end of 21st century compared to the 20th century for all four Representative Concentration Pathways (RCP) scenarios (Hijioka, et al. 2014). This warming will likely cause an increase in extreme weather events including high rainfall associated with tropical cyclones. Consequently, ASEAN member states constitute some of the most vulnerable countries to climate change impacts. In particular, the Philippines, Myanmar, and Viet Nam all face serious risks associated with typhoons, floods, and droughts. Among ASEAN countries, Myanmar was most affected by climatic events during the period 1996-2015, followed by the Philippines (Kreft et al., 2017). Globally, Myanmar was ranked 2nd, the Philippines 5th, Viet Nam 8th and Thailand 10th in terms of climate risks in 2017.

The climate change impacts on transboundary natural resources in Southeast Asia are significant. Most projections indicate increased flows in all major transboundary rivers in the region due to increased runoff. At the same time, droughts and water scarcity in the catchments of transboundary rivers such as Mekong River and Red River are projected to worsen in parts of the region. In the case of the Mekong River basin, catchments in Northeast Thailand and the Tonle Sap of Cambodia could experience moderate to high levels of water stress (Judy, et al. 2008). Similarly, climate change projections indicate reduced flow during dry seasons for the Red River. Using the Hydrological Modelling System (HEC-HMS), Duong et al. (2016) projected that Red River flows will significantly reduce in the northern area of Viet Nam for the period 2026-2035. The river flows could be even significantly lower in higher emission scenarios especially in the western reaches of the Red River Basin.

Climate change has been projected to have significant impact on the vast biodiversity and ecosystem services of the region. The Great Transition Initiative (GTI) scenarios up to the year 2050 indicated that climate change, along with other developmental pressures, can reduce ecosystem services in the region by as much as 19% compared to the year 2011

(Ida, et al. 2017). Climate change is also projected to negatively affect the resilience of Southeast Asia's marine biodiversity. Elevated sea surface temperatures and ocean acidification could impact marine biodiversity, which is already under pressure from over-exploitation, degradation, pollution and fragmentation (Chou 2014).

Human mobility across ASEAN has been a significant factor in the regional integration that has taken place over the past three decades. While economic integration and related livelihood opportunities have provided incentives for human mobility in the ASEAN region, cross-border migration, both temporary and circular, in the aftermath of major disasters such as floods and droughts has also been observed (The Nansen Initiative 2014). Repeated disasters act both directly and indirectly forcing vulnerable populations to migrate in search of safety and alternative livelihoods. Such migrations have provided economic respite for the affected populations and have contributed to significant income flows through repatriation of earnings. While migrations may have contributed to the economic resilience of the migrant populations, these migrants are vulnerable to crime and security risks, and may have contributed to social tensions in the destination of migration. Climate change is projected to further intensify drivers for migration as vast populations live in the coastal areas and river basins of Indonesia, Myanmar, the Philippines, Thailand and Viet Nam. These areas are projected to be affected by severe floods causing displacement and migration (ADB 2012, McGranahan, Balk and Anderson 2007).

2.2.2 Existing mechanisms to address impacts

Compared to other Asian sub-regions, Southeast Asia is relatively advanced on regional cooperation. This cooperation extends to a variety of issues, especially on transboundary pollution and transboundary water resource management. As a result, the region is better prepared to address transboundary impacts of climate change than other sub-regions in Asia. ASEAN has recognized the importance of regional and international cooperation in addressing climate change, both for mitigation and adaptation, and has put in place various mechanisms to promote such regional cooperation. In the ASEAN Socio-Cultural Community (ASSC) Blueprint 2009-2015, ASEAN recognized the need to exchange scientific information and related skills on climate change impacts, as well as to build capacities of ASEAN Member States (AMS) to address climate change impacts for an economically vibrant and environmentally friendly ASEAN region.

Recognizing the success achieved under the initial implementation period of the Blueprint, ASEAN issued a revised 'ASEAN Socio-Cultural Community (ASSC) Blueprint 2025' in 2016 (ASEAN 2016). The revised Blueprint reiterates the collective will to improve human life in the ASEAN region. ASEAN also established the ASEAN Working Group on Climate Change (AWGCC) to implement the ASEAN Climate Change Initiative (ACCI) and act as a cooperation platform for the region to address climate change issues (ASEAN 2018).

ASEAN has also established the Action Plan on Joint Response to Climate Change in 2012, which acts as a detailed reference to implement the blueprint (ASEAN 2012). The Action Plan lays out strategic objectives for addressing climate change in the region along with a detailed programme of action. Among other things, the components that are directly relevant for addressing transboundary issues of climate change include strengthening research and

development for enhancing climatological observations, downscaling climate projections for local applications and sharing information for better decision-making by the AMS. It also recognizes the importance of cooperation with regional institutions and initiatives such as the Mekong River Commission (MRC) and Greater Mekong Sub-region.

ASEAN also developed mechanisms for governing shared natural resources in the region. The MRC is one example. The MRC was established in 1995 to succeed the Committee for Coordination of Investigations on the Lower Mekong Basin—The Mekong Committee—originally established for financing, managing and maintaining the Mekong River. MRC is an intergovernmental organization, with members from Thailand, Lao PDR, Cambodia and Viet Nam. It is governed by a Council of Ministers, a joint committee and a secretariat. The MRC provides a platform for discussion and for reaching agreement particularly on transboundary issues.

Even though the original Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin 1995 does not explicitly focus on climate change, the MRC has taken up a number of initiatives to understand and address the implications of climate change on the Mekong River Basin. The Mekong Integrated Water Resources Management Project is designed to promote coordinated development and management of Mekong waters. Through such projects, the MRC has contributed to streamlining communication among the member states, sharing river basin data, flood early warning and forecasting, and strengthening livelihoods. The MRC Strategic Plan 2016-2020 specifically focuses on transboundary river basin management (Mekong River Commission 2016) as an important aspect of the core river basin management functions of the MRC and identified it as a key outcome area under regional cooperation. The MRC is committed to developing knowledge products and guidance that help identify national actions that could have transboundary impacts. It funds a program on transboundary environmental impact assessment and has also established a conflict resolution mechanism for addressing transboundary environmental impacts of developmental actions by the member states (MRC 2018). More recently, the MRC under its Mekong Adaptation Strategy and Action Plan (MASAP) aims to address transboundary impacts of climate change and transboundary adaptation needs (MRC 2016). This is an important development on transboundary adaptation cooperation.

2.2.3 Gaps to fill

While ASEAN has made significant progress in putting in place broad framework agreements among the AMS including formulation of action plans, concrete actions are yet to be fully shaped towards fulfilling the objectives and expected outcomes stated in the ACCI or in the ASSC. The different priorities of AMS on climate change issues constitutes a challenge to agreeing on a common position on climate change. While regional mechanisms such as MRC have been successful in identifying issues and establishing regular communication among the member states, these mechanisms are yet to be successful in fully mainstreaming transboundary issues into national level budgetary priorities and programming.

There is a need to specifically review national plans and policies by keeping in view the regional impacts of climate change. Some serious gaps are developing, and sharing relevant

scientific knowledge among the member countries can help them to clearly see the transboundary impacts of climate change. There is a gap in understanding the impacts of human interventions and climate change on transboundary natural resources such as biodiversity and forests. Work needs to be done on developing optimized national and regional solutions that will contribute to addressing the transboundary impacts of climate change, identifying region-wide benefits of such optimized approaches that will accrue to individual member states, and providing sufficient guidance to countries to understand the region-wide perspectives and implications of regional actions. There is a dearth of information on transboundary ecosystem services provided by transboundary natural resources in the region and the costs and benefits of safeguarding these resources for individual member states as well as for the region as a whole.

2.3 Hindu Kush Himalayan Region

2.3.1 Transboundary impacts of climate change

The vast Himalayan range, also known as the Hindu Kush Himalayan (HKH) region, extending from China in the east to Afghanistan in the west, is a unique geographic formation. Countries that fall within the HKH region also include countries that are part of the South and Southeast Asia regions. Hence, any climate change impacts on the HKH region will necessarily impact South and Southeast Asia.

The HKH region stores a massive amount of snow and ice in glaciers. These provide the sources of ten major river systems; the Amu Darya, Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Yangtze, Yellow and Tarim (Eriksson, et al. 2009). The snowmelt and rivers provide support to the lives and livelihoods of 210 million people directly and over 1.3 billion people indirectly. A strong upstream-downstream linkage exists between landforms, ecosystems, people, economy and flow of various services. Although Himalayan and downstream mountain ranges extend into parts of South Asia and Southeast Asia, the climate impacts and adaptation needs of the Himalayan region are distinct and demand special attention from the viewpoint of adaptation planning and regional collaboration.

The HKH region is considered highly sensitivity to changes in climatic variables (Singh, et al. 2011). The warming trend in the region is higher than the global trend – 4-5°C warmer in some high altitude places – and projected to increase by about 1-2°C on average by 2050 (Shrestha, Grabs and Khadgi 2015). Vegetation, especially in the alpine region, is reported to be shifting upwards due to warming conditions at higher elevations. The four largest floods that occurred in the region between 2000 and 2013 resulted in the deaths of more than 10,000 people and the displacement of another 50 million people. Each disaster affected more than one country.

Melting glaciers are a threat to the future water security of the region, as well as posing an imminent risk from GLOF. The glaciers in the region are generally retreating or shrinking and thinning due to climate change, more than 8,000 glacial lakes have formed and a number of GLOF events have been reported (Bajracharya, et al. 2015, Ives, Shrestha and Mool 2010). In the coming decades substantial glacial mass and area losses are projected; more for the glaciers within the Mekong River basin (by 39 to 68%) and the lowest in the Indus River basin (by 20 to 28%) (Shrestha, Grabs and Khadgi 2015). Most of the above-mentioned

impacts of climate change are transboundary in nature due to strong upstream-downstream connections.

2.3.2. Existing mechanisms to address impacts

There are no formal agreements or mechanisms for regional collaboration on climate change adaptation, although the need for such mechanisms is being increasingly felt (Sadoff, et al. 2013, Shrestha, Grabs and Khadgi 2015). Differences in national priorities and geo-political interests in the region have been barriers to regional collaboration. Climate change adaptation is yet to be addressed as a regional issue, while national adaptation planning processes are still in the transitionary stage. Bilateral agreements on water resource issues exist between India and the riparian countries of Bangladesh, Bhutan, China, Pakistan and Nepal (Shrestha, Grabs and Khadgi 2015). Adaptation has surfaced as a new concern for these existing mechanisms. The need for coordinated flood risk management between China, Nepal and India has already been recognised. This became apparent during the Koshi Flood in 2008. A breach of the Koshi embankment displaced more than 70,000 people in Nepal and over 4 million in Bihar of India (Shrestha, Grabs and Khadgi 2015).

Regional organizations such as the International Center for Integrated Mountain Development (ICIMOD) and other development partners are promoting adaptation related activities through various programs and projects. ICIMOD has identified six transboundary landscapes (Kailash, Kangchenjunga, Far Eastern Himalaya, Hindu Kush Karakoram Pamir, Everest, and Cherrapunjee-Chittagong) programs aimed at enhancing socio-ecological resilience to environmental change (ICIMOD 2018). The Kailash Sacred Landscape Conservation and Development Initiative (KSLCDI), a collaborative effort between China, India, and Nepal, covers an area that contains the origins of the Brahmaputra, the Indus, the Karnali, and the Sutlej rivers (Zomer and Oli 2011). The KSLDCI aims to mainstream climate change adaptation into sustainable ecosystem management approaches. The Himalayan University Consortium is a dynamic mountain knowledge partnership among 16 universities, ICIMOD, and regional member country partners to promote research and learning. It works closely with the Mountain Partnership (MP), Asia Pacific Adaptation Network (APAN), and South Asian Network for Development and Environmental Economics (SANDEE) (ICIMOD 2015). ICIMOD in collaboration with World Meteorological Organization (WMO) and its eight regional member countries initiated the Hydrological Cycle Observing System (HYCOS) (Shrestha, Grabs and Khadgi 2015, Molden, et al. 2014). HYCOS is a regional flood information system (RFIS) in the Ganga-Brahmaputra-Meghna and Indus Basins that provides hydrological information, for monitoring, analysis, and the development of end-products for decision making by users.

2.3.3 Gaps to fill

There is a huge need and scope for transboundary cooperation on climate change adaptation in the Himalayan region. Collaboration on sharing scientific knowledge, information and technology is of the utmost importance in three areas. The first area of cooperation is to deal with the changing topology of extreme events that are increasingly becoming transboundary in nature. The current emphasis in regional cooperation is on

coordinating responses to deal with disaster. Little attention has been given to addressing long-term adaptation issues or addressing upstream-downstream concerns.

The second area where cooperation is needed is on dealing with the long-term issues associated with shifting means, i.e. progressive changes in climate with impacts on water resources, agriculture, and biodiversity. There is also a possibility of transferring appropriate technologies and innovations to improve water use efficiency or introduction of drought resistant varieties of agricultural crops.

The third area where collaboration on adaptation is needed is on the social consequences of climate change. For instance, mobility and migration of people affected by climate impacts in search of jobs and opportunities requires specialised coordination to minimize the vulnerability of the affected population. A regional conflict resolution mechanism is also needed to avoid and deal with conflicts over land and resources and the intensification of risks especially between upstream and downstream areas.

3. Recognition of Transboundary Impacts in International Climate Change Processes

The national adaptation plan (NAP) process is a significant outcome of the Cancun Adaptation Framework and is further strengthened by the Paris Agreement, elevating its importance as a central response to climate change in 2015. The Paris Agreement also includes the nationally determined contributions (NDCs) are considered important to achieving the goals enshrined in the Agreement.

The Conference of Parties (COP) and the UNFCCC have provided several mechanisms for helping countries to formulate and implement their NAPs. These include a) formulating national adaptation planning guidelines at the behest of the COP to the LDC Expert Group, b) organizing an annual NAP Expo as a platform for countries and institutions to interact on solutions related to the formulation and implementation of NAPs, c) a global support program for LDCs (to be established by United Nations Development Program and United Nations Environment Program) to provide one-on-one institutional support on matters related to NAPs, and d) supporting developing countries (non-LDC Parties) in national adaptation planning measures under the Adaptation Committee. In addition, there are numerous bi- and multi-lateral initiatives (including financial support channels) to assist developing countries with their NAP processes, such as the Global Environment Facility and the Green Climate Fund.

NDCs are expected to cover both the mitigation of emissions and adaptation to the adverse impacts of climate change. Developing countries have emphasized adaptation in their NDCs more than developed countries. Nevertheless, not all developed countries have left out adaptation and resilience language from their NDCs. For example, Canada and Australia have included wording on adaptation in their NDCs (the current NDC registry of several countries are simply brought forward from the Intended Nationally Determined Contributions (INDCs) submitted until 2015 and some of them are updated and resubmitted as NDCs).

Even though other developed countries give less attention to adaptation and resilience in their NDCs, including EU member states, this should not be seen as reflective of their stances on adaptation. Some are already experiencing significance damages from climate change and are providing support to promote adaptation globally.

Despite the support to developing countries, only a handful of them have submitted their NAPs. Several are still in the process of establishing the national level institutional mechanisms for NAPs. Most South Asian nations which are home to some of the most vulnerable populations in the world are yet to submit their NAPs. Further delay in preparing NAPs and their implementation means a delay in concrete actions that could have been taken in a timely way.

NAPs and submissions to access available funds for adaptation such as the Green Climate Fund (GCF) Readiness and Adaptation Planning Support program usually lack systematic integration of existing knowledge on climate change impacts, vulnerability and adaptation, and the integration of social considerations, including gender, in long-term national priorities. This last aspect has become a requirement for accessing global funding for climate change action: the GCF specifically recognizes the importance of social and gender considerations for Readiness and Adaptation Planning Support (Green Climate Fund 2017). The transboundary impacts of climate change on society, gender and economy will be profound; hence they are an integral part of a holistic approach to adaptation planning.

While country-specific circumstances dictate the progress made under NAPs, there are several common issues facing countries in South Asia that have held back their progress on their NAPs. These include:

- limited funding at the national level and fragmented international support to write and implement national adaptation planning strategies and actions,
- limited coordination among the national stakeholders and engagement with the expertise available at the local, regional and international levels, and
- weak links and limited focus on long-term social and structural dimensions of climate change, such as gender.

The UNFCCC and the work of the COP has placed the emphasis for adaptation planning on nation states. This is understandable from administrative and management expediency points of view. However, it does not encourage countries to cooperate on identifying solutions that work best for addressing climate change impacts at the scale and depth that are necessary. The discussion on adaptation planning has not moved beyond political boundaries as institutional, political and financial systems necessary for national and subnational adaptation plans are not yet fully in place. With the current pace of adaptation planning and understanding of climate change impacts, putting in place transboundary adaptation plans is a distant priority for countries. However, any delay in recognizing and addressing the transboundary impacts of climate change would render the NAPs ineffective in an increasingly integrated region.

There also appears to be lack of recognition in the international processes for the need to address the transboundary impacts of climate change. Even though the Paris Agreement emphasizes cooperation among countries to address climate change adaptation needs,

such cooperation is only mentioned from the point of view of sharing technologies, experiences and financing adaptation. Grouping of countries based on their economic status (least developed countries) or geographical status (e.g. Small Island Developing States) seems to have made little difference in the way countries cooperate with each other to address the transboundary issues associated with adaptation. Establishing a dedicated Warsaw International Mechanism on loss and damage has clearly emphasized the importance of addressing non-economic loss and damages, many of which fall under the purview of the transboundary aspects of adaptation planning, but there is no clear emphasis on addressing these impacts from a transboundary perspective within the international mechanisms.

Box 1

International Transboundary Conventions and Climate Change Adaptation

Transboundary natural resources are important international, regional and national assets. Protection of these resources is critical for the wellbeing of nations. Transboundary natural resources are increasingly under pressure from the direct effects of human interventions and climate change. There are some international conventions that have some relevance to transboundary natural resources. These include the Helsinki Rules on the Uses of the Waters of International Rivers (1966), Convention on the Protection and Use of the Transboundary Watercourses and International Lakes (Water Convention, 1992), the Law of Transboundary Aquifers (2008), Convention on the Law of the Non-navigational Uses of International Watercourses (1997), Convention on the Conservation of Migratory Species of Wild Animals (1983), Convention on Biological Diversity (1992), Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973), United Nations Convention to Combat Desertification (1994), International Tropical Timber Agreement (1994), and Ramsar Convention (1971). However, there are very few international conventions, rules, and legal instruments that are particularly relevant to transboundary natural resources and their management in Asia.

Many of the international conventions suffer from a number of limitations with respect to the promotion of regional collaboration on adaptation in relation to transboundary resources. They provided limited or no recognition of climate change, are only ratified by a few countries, do not always lead to implementable solutions, provide few or no incentives for implementation, and suffer from legal and institutional issues.

There is an emerging view that regional cooperation for regional adaptation planning could hasten the process of adaptation. It could enable countries to harvest the resources available regionally and internationally much more quickly due to their collective power and provides the possibility of ‘synergistic learning’ among countries with similar adaptation needs.

4. Mechanics of a Regional Adaptation Plan and Cooperation

4.1 Imperatives for regional adaptation planning

Addressing transboundary impacts of climate change is challenging for technical and institutional reasons. The technical reasons include limited information of cause-effect relations in geographical and time scales. Information on cause-effect relationships in terms of climate change impacts, where and when they originated and who is impacted is often missing from current decision-making processes, since most of the current climate change impact-related work is focused on point-based understanding. The focus is on impacts in a given location, most often limited to administrative boundaries. The 'teleconnections' these impacts may have had with processes taking place physically at distant places, but that are interconnected through ecosystems and man-made connections, are largely ignored. In absence of this broader view on impacts and vulnerabilities, point-based approaches often have limited effectiveness in addressing impacts. Even though approaches are evolving, with more and more interventions adopting river basin and watershed approaches, adaptation to climate change could benefit from even broader thinking by using the whole sub-region or the region as a unit for analysis, planning and action. This is not just because of the direct physical and environmental connections across a given region, but also due to the increasingly economic dependency of populations on countries and regions distant from their own location.

A second challenge to addressing transboundary impacts is the lack of scientific understanding of the costs and benefits of interventions that address transboundary impacts. For example, preserving wetlands or forests in a regional context could have benefits beyond national boundaries. However, efforts to preserve these common resource are still bound to the country within which these resources are physically situated. Scientific research is needed to deepen understanding of the benefits accrued to individual countries by preserving transboundary resources.

While some progress has been made in parts of Southeast Asia, geopolitical and security interests and lack of transboundary governance institutions are holding back collaboration on the management of transboundary resources in the region. Institutional coordination is difficult and coordination across borders is even more difficult when countries put their own short-term interests before the collective interests of the region. The process of developing a regional adaptation plan could help countries see beyond their short-term interests and help them to recognise that regional cooperation on natural resources is essential for effective adaptation.

It takes collective leadership to identify and address issues associated with common resources. Hence, there is a need to break away from dysfunctional regional mechanisms to address immediate adaptation priorities, initiating a regional adaptation plan could help in that direction.

Additionally, there is limited institutional cooperation between knowledge producers, i.e. research and academic institutions, between the regions. Lebel & McLean (2018) explain that countries in the global South need context-appropriate adaptation strategies. These depend on highly localized data. Such data can be collected, curated, analysed and published by researchers in the region. Moving beyond just the publication of this information, regional collaboration on adaption can include the sharing of experiences, knowledge and information, which would help with the production of context-based tools and guidelines for countries preparing and implementing adaptation plans and strategies.

4.2 Mechanics of a regional adaptation plan

From the discussion in sections 2 and 3, it is evident that there is a lot to be gained by sub-regions having a transboundary regional adaptation plan. Such plans can fill important gaps left by national adaptation plans, which largely ignore how teleconnections affect climate change impacts. In addition, transboundary regional adaptation plans will help identify regional resources (i.e. technical and financial capacities) that could help address climate change impacts on transboundary natural resource and other teleconnections. Like any planning, regional adaptation planning is a function of cooperation, but, where cooperation is weak, initiating regional adaptation planning could have the reverse effect of helping to strengthen regional cooperation on adaptation.

Figure 3 shows the overall architecture of an ideal regional adaptation planning process. As is evident from the figure, the regional adaptation plan process is not independent of the national adaptation planning process but rather aims to strengthen it. In addition, regional cooperation is an important enabling factor for the regional adaptation planning process. A regional adaptation plan is not the sum of all national adaptation plans in a region but rather it fills important gaps that national adaptation plans cannot address; hence it is a planning process by itself, though it can build on the national adaptation planning that is already underway in most countries in the region. This is the right time to initiate a regional adaptation plan as it would help countries to mainstream regional issues into the national adaptation plans that they are currently developing.

4.3 Important tenets of regional adaptation planning

In order to sustain a regional adaptation plan process, there are at least four tenets that need to be addressed: 1. The process should be able to recognize transboundary resources and understand impacts, 2. It should be able to translate these impacts into agreed regional goals for adaptation, 3. It should be able to facilitate nations to commit resources for regional adaptation planning, and 4. It should facilitate complementarity between the regional adaptation plan and national adaptation planning.

4.3.1 Recognizing transboundary resources and understanding impacts

From the discussion presented in section 2, it is evident that there are considerable transboundary impacts of climate change. However, current information on impacts is not sufficient to prompt countries to come together to address climate change impacts.

Information on which country would be affected and by how much due to a given climate change impact on a transboundary natural resource is lacking.

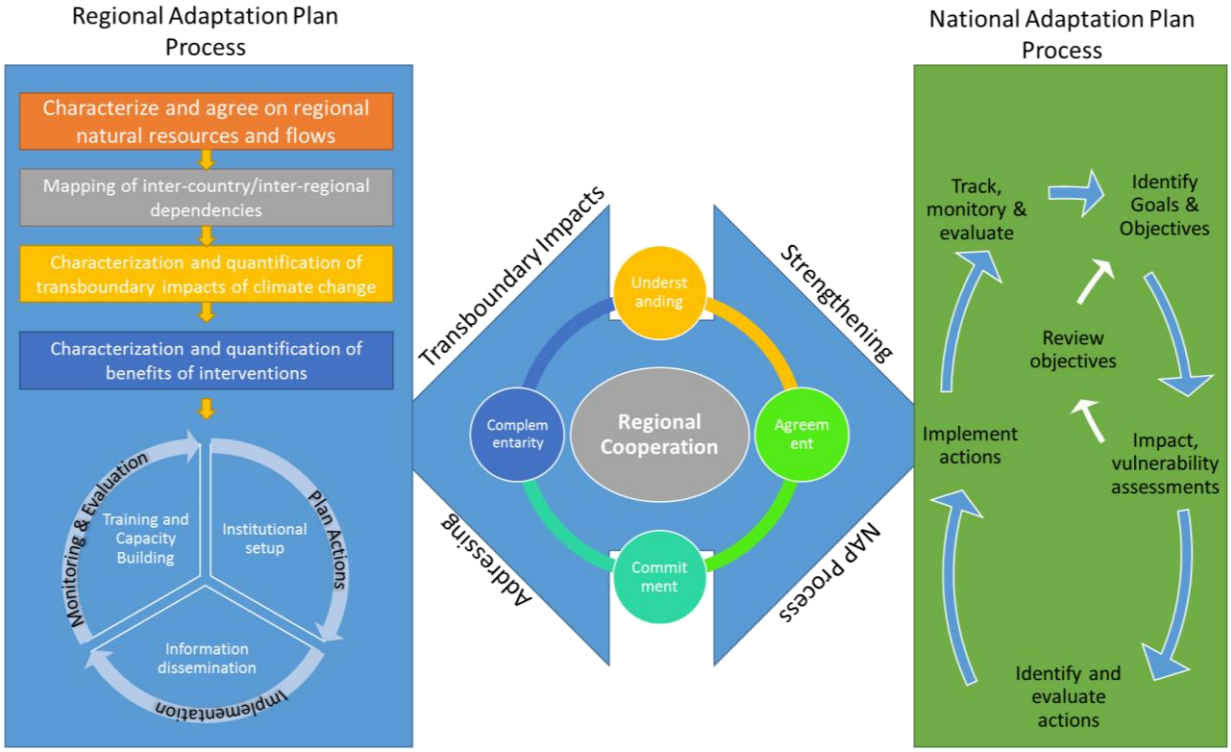

Figure 3. Architecture of a regional adaptation planning and cooperation process for addressing transboundary impacts of climate change

(Source: Authors)

The regional adaptation planning process should start with recognizing regional natural resources, understanding the importance of governing them, and understanding the impact of climate change on them. A regional adaptation plan process should initiate studies that clearly delineate how individual countries are affected by impacts on transboundary natural resources. Deepening understanding of the impacts on transboundary rivers is a good place to begin, as the importance of transboundary water management is clearly recognised in the sub-regions.

A transboundary natural resource is a natural resource that traverses political boundaries. Current understanding of climate change impacts on transboundary natural resources such as forests, wetlands and other natural ecosystems is poor. This includes understanding of adverse and beneficial impacts, and on how responsibilities can be allocated among countries. In some cases, understanding impacts may not be easy as the implications can be far reaching. even though they are entirely located in a single country and hence may not be recognized as a transboundary resource.

Issues such as impact on food prices due to disasters elsewhere in the region, and transboundary social mobility impacts due to catastrophic climatic events are not substantially researched to be addressed within adaptation planning. Mainstreaming such transboundary impacts into the national level risk and vulnerability assessments is another

way of recognizing their importance. Differences in risk assessments, with and without considering transboundary impacts, will clearly show the additionality involved.

4.3.2 Setting adaptation goals at the regional level

Setting adaptation goals at a regional level is a collective process that ensues after the impacts are well understood and before the roles and responsibilities of individual countries are clearly agreed upon (see Box 2). While there is no clear metric for when an adaptation goal is agreed at the international level, regions could decide regional adaptation goals based on the regional context, the impacts to be addressed and the timeframe that is available to the region before irreversibly damaging transboundary resources or damaging the prospects of addressing transboundary impacts. The regional adaptation goal, once agreed, would become a shared burden among the countries. Studies that identify costs and benefits of governing regional resources and transboundary impacts can inform countries as to who benefit most from interventions and who could bear most of the costs.

Box 2

Global Adaptation Goal and Regional Adaptation Planning

One of the important contributions of the Paris Agreement to adaptation is setting the Global Goal on Adaptation (GGA). The Agreement states "…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 response in the context of the temperature goal…." Setting the global goal on adaptation is an important step because it provides a means to measure the progress made by countries and can motivate countries to tally their progress. This is an important progress from the adaptation metrics debate that the Bali Conference of Parties (2007) has initiated. The discussion on adaptation metrics helped gain progress in important areas of adaptation such as measuring vulnerabilities, risks and monitoring and evaluation frameworks to measure the progress in adaptation. The Global Adaptation Goal gave a new impetus to stakeholders who have been instrumental in developing concepts and tools to measure adaptation that were originally established at the behest of the Bali Conference. While individual actors including institutions and countries have already initiated efforts to dissect the GGA for its practical application, there is no real metric that has been set to measure and monitor the GGA. In its absence, the major recommendation emerging is to promote adaptation plans, build capacities of countries including in terms of risk and vulnerability assessments, and scale up adaptation financing to match needs. Regional cooperation can help achieve the GGA as it hastens the process of adaptation planning by making available financial and technical capacities that countries need to realize effective adaptation plans that take into account transboundary issues.

4.3.3 Identifying and committing resources for adaptation planning and projects

Countries would have to identify regional resources that can be committed to realize the regional adaptation goal. Committing regionally available resources including technical expertise from institutions and financial resources from those that can be shared by the national governments and those financial resources that can be tapped from the bi- and multi-lateral financial sources is necessary to operationalize the regional adaptation plan. The currently available finances from the international, bi- and multi-lateral sources are largely bound to individual countries; however, funding for regional initiatives might be made

available by working with the donors and by highlighting how such regional initiatives can help individual countries. In terms of technical capacities, each sub-region in Asia already has several regional institutions that specialize in sectors relevant to climate change adaptation and can be effectively engaged in preparing a regional adaptation plan.

Committing resources requires political consensus on the part of individual countries and establishing a continuous coordination function is necessary to follow up the commitments of individual countries. The regional adaptation planning process should be able to identify specific projects that can be implemented at the regional level to address the transboundary impacts of climate change.

4.3.4 Ensuring complementarity and continuity between the regional, national and sub-national adaptation plans

There is a need for linking the regional adaptation plan with that of the national and sub-national adaptation plans so that the roles and responsibilities can be prioritized at those levels. Such linking is also necessary so as to fully take into consideration the gaps addressed and avoid repetition of efforts if any. Strengthening the national adaptation plan is an important benefit provided by the regional adaptation planning and cooperation processes. They not only identify important gaps in addressing national risks, but also help in facilitating and channelling regional technical and financial resources that could be engaged in strengthening national adaptation planning.

4.4 Mechanics of regional cooperation

A regional cooperation mechanism on adaption (see Box 3) would bring together regional centers that are related to climate change, natural resources, and disaster risk reduction. It will then engage them on regional and national adaptation planning. This will enhance the capacity of regional centers and strengthen their contribution to the region as a whole on an issue that is common to all countries in the region.

4.4.1 The Four Fundamental Elements of Regional Cooperation for Adaptation

Any regional cooperation for adaptation should at least satisfy the following four elements for the cooperation to be successful: a. facilitate capacity building and information sharing, b. enhance collaboration especially by strengthening public-private partnerships, c. enhance financing for adaptation, and d. facilitate sustainable institutional mechanisms that put countries in the driving seat.

Capacity building and information exchange: Unlike other information exchange platforms that have remained as repositories of information with a uni-directional information flow, a regional cooperation initiative should be able to link national actors with individual and institutional expertise wherever they exist, acting as a peer-to-peer exchange platform. Individual experts and institutions can readily respond to questions raised by national actors engaged in the adaptation planning process on specific technical and policy issues that may be hindering their progress. Regional cooperation should also support and build the capacity of local and regional research institutions to respond to this demand, promoting collaboration

between climate and environmental scientists on one side, and social scientists on the other. Peer-to-peer exchange of skills, and high-quality and policy relevant information has the power to contribute to addressing specific adaptation issues, as opposed to broad-based discussions in a setup like that of public forums, which are good tools for sharing information to wider audiences.

Box 3

South and East Asian Regional Cooperation for Adaptation Planning (SEARCAP)

This paper proposes South and East Asian Regional Cooperation for Adaptation Planning (SEARCAP) as a mechanism for a collective effort of Asian countries on region adaptation. SEARCAP would harness technical and financial resources that are available regionally and or those resources that are available internationally but are not easily accessible to Asian countries. SEARCAP would promote 'self-help' among Asian countries as a form of south-south cooperation in addressing the transboundary impacts of climate change while also strengthening national adaptation planning.

Enhanced public-private partnership: Regional cooperation should engage public-private partnerships for supporting adaptation planning and implementation in the region. This is because private sector investments will directly benefit from the risk reduction brought about by adaptation plans. Through enhanced collaboration, regional cooperation will link its members with financial actors who could offer mentorship and expertise, as well as strengthen tests for financial sustainability of the projects, strategies and adaptation plans.

Coordinated financing: Financing is an important aspect of adaptation planning. However, current adaptation planning is insufficient and fragmented. Further, most adaptation finances are bound to individual countries and there are very few resources available to support adaptation initiatives implemented at the regional scale. A collective effort at the regional level could help countries build their capacity to generate domestic revenues for adaptation in innovative ways, while also helping them access international finances. In particular, it would support raising those finances that are necessary to promote regional adaptation interventions.

Institutional mechanism: Putting in place a full-fledged institutional support mechanism is of the utmost importance for the success of regional cooperation for it to be long-lasting and successful. For the cooperation to be sustainable, it is important that countries are the drivers for cooperation as they are the primary beneficiaries of the process. For achieving efficiency and ownership, the institutional mechanism could consist of a regional cooperation council with one member coming from each country in Asia, supported by a secretariat that acts as a coordination and implementation unit.

In addition, this element would also consist of pooled efforts by Asian countries to produce tools and guidelines that can assist countries prepare and implement adaptation plans. These collaborative products would be readily adoptable by individual countries as these are made keeping in view regional synergies, institutional commonalities and contextual similarities among Asian countries. Under this collaboration, countries will come together to

organize ‘writeshops’ for producing certain specific guidelines (e.g. mainstreaming agriculture issues into adaptation plans, bridging gender gaps in adaptation planning, addressing the dichotomy of short-term needs and long-term goals, etc.). Such collective efforts have already helped regions such as ASEAN to quickly enhance their disaster risk reduction readiness. Similar initiatives can be taken up in other parts of Asia.

5. Conclusion

Global support for promoting adaptation both in terms of technical and financial assistance is growing, though only a few countries have reached the stage of submitting their NAPs. Developing effective NAPs is a complicated process requiring a great deal of financial and technical resources, much akin to the implementation of environmental standards during the early 1990s. There is a lack of examples for countries to emulate and a lack of continued support for countries to move from one stage of planning to the next. Also, Asia lacks a regional mechanism attuned to the needs of each country that could support the NAP processes.

Asia also lacks a regional mechanism that could help countries collaborate on addressing the transboundary impacts of climate change. These are likely to be immense, but receive little attention in national and regional processes. Some progress has been made; for example, in the case of the ASEAN region, intergovernmental bodies like the MRC have been able to invest resources to generate scientific information to support regional initiatives on transboundary impacts. However, such initiatives addresses only a small fraction of the host of transboundary implications of climate change that the sub-regions and countries will have to deal with. Ignoring these regional impacts could undermine the efforts that countries may have put into their national adaptation planning.

In this paper, it has been made clear that regional cooperation has a significant role to play in addressing the transboundary impacts of climate change. Regional cooperation enables countries to work together on collective adaptation solutions to address the impacts of climate change on transboundary natural resources and other teleconnections. This paper has sketched the basic outline for a regional adaptation mechanism.

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