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Paris needs regional pledge

A majority of South Asians are dependent on natural resource based livelihoods such as agriculture, forestry, fisheries and livestock. Even small climatic shocks can result in large and irreversible losses to those people. Obviously, it is the marginalized communities that are the hardest hit.

Extreme events have affected tourism, forestry, small businesses and infrastructure. Illnesses, deaths and mass displacement are also caused by floods and higher temperatures. The habitation, seasonal activities and migration patterns of many terrestrial, freshwater and marine species have shifted in response to climate change. The heavy reliance of the economies of South Asian Association for Regional Cooperation (SAARC) countries on climate-sensitive occupations will affect poverty alleviation efforts, including the attainment of the Sustainable Development Goals.

Climate cooperation has been discussed for long, but little has been achieved on the ground in South Asia. Hindrances include challenges related to competing national priorities, lack of awareness and capacity, inadequate financial resources, and institutional barriers. There is a limited understanding in the region of what indicates a good climate practice, how to identify and undertake suitable interventions and how to replicate and scale them up.

Given its sheer size, variability and resource constraint, no single strategy will meet the needs of all communities and contexts in South Asia. The 2015 Paris Agreement's stress on regional efforts has provided an opportunity to come together and renew the climate-related commitments of SAARC countries. South Asia stands to benefit from integrated climate adaptation, mitigation and development approaches. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change points out that there are many complementarities among climate adaptation, mitigation and development.

Implementing climate actions is costly. The investment needed to achieve the ambitious goals of the Paris Agreement on climate change lies in trillions of dollars. So, financing remains the biggest hurdle for resource-poor South Asia. By far the largest sums of capital lie in the private sector, and aligning these private funds with climate and sustainable development goals is key. Public finance, though small in amount, is crucial for providing public goods and services.

South Asian governments will need to consider different financing options, in collaboration with stakeholders, including the private sector actors. Policymakers and decision-makers must think strategically and carefully about how the architecture of climate finance should evolve and how such mechanism can benefit their countries. SAARC should effectively address the gaps in cooperation, financing and technology needed to address climate change impacts.

Not only that, South Asian countries are already accumulating practical experience in adapting to climate change at the regional, national and local levels. There are practices that have shown potential for effective climate adaptation, which can be enhanced and scaled up. For example, South Asian countries are already adopting climate adaptation strategies and practices for particular crops and geographic areas.

Considering the common vulnerability, diverse stages of development and the trans-boundary nature of climate change impacts, a good immediate step would be to identify areas of common interest for joint regional projects and clarify the special and differentiated rights and obligations of countries with different levels of development. SAARC Development Fund may assist in financing of adaptation and mitigation with increased mandate and finance. Special focus is demanded by the most vulnerable communities and the least developed countries that bear the climate change brunt the hardest but have the least wherewithal to deal with it.

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First CPEC trade activity kicks off

PAKISTAN and China kicked off their first trade activity under the China-Pakistan Economic Corridor project (CPEC) on 31 October.

Over a hundred Chinese containers arrived at the Sust Port to mark the occasion. Later the containers left for Gwadar. The customs superintendent at the Sust Port, Mr. Ishaq Kiani, informed that containers loaded with CPEC projects goods were exempted from paying import tax.

An inaugural ceremony held at the port a day earlier was attended by Chinese and Pakistani officials including Gilgit-Baltistan Chief Minister Mr. Hafeezur Rehman. (*http:// www.dawn.com*, 1.11.2016)

Pak-Afghan trade halves 'due to transit trade glitches'

FORMER deputy trade minister of Afghanistan Mr. Muzamil Shinwari has said that bilateral trade with Pakistan has gone down substantially due to 'problems' in transit trade.

"If these problems are not addressed, bilateral trade could witness further decline," warned Mr. Shinwari, who was the chief negotiator for the 2010 Afghanistan-Pakistan Transit Trade Agreement (APTTA).

Mr. Shinwari said that the Pak-Afghan trade volume was US\$2.5 billion in 2010 which has now come down to US\$1.8 billion cautioning a further decrease in bilateral trade if transit trade through Pakistan is not facilitated.

Pakistani officials used to say earlier that Afghanistan imports nearly 60 per cent of items from Pakistan; however, diplomatic tension has badly affected trade relations.

"If the transit trade is affected, it would have a direct impact on bilater-

al trade as both are inter-linked," Mr. Shinwari argued. "Afghan traders, involved in transit trade, used to buy goods in Karachi, Lahore, and Faisalabad. Now they will move to Iran where they can buy goods in Zahidan, Mashhad and Tehran," he said.

Mr. Shinwari claimed that Pakistan had agreed during the APTTA negotiations in Islamabad to allow Afghanistan use the Wagah Border with India in the presence of then United States secretary of state, Mrs. Hillary Clinton, and former prime minister Mr. Yousaf Raza Gilani.

"We allow Pakistani goods to be transported via Afghanistan to Tajikistan, Turkmenistan and Uzbekistan and even Russia and Europe. If Pakistani goods are exported to Central Asia, Afghanistan has the right to use Pakistan's territory for trade with South Asia," he insisted. (*www.tribune. com.pk*, 24.10.2016)

CBD adopts benefit sharing plan for genetic sequences

PARTIES to the Convention on Biological Diversity (CBD) have adopted a decision on sequence information of genetic resources. The decision sets in motion a plan intended to lead to an important decision at their next meeting in two years' time.

The decision was adopted by the 22nd meeting of the CBD Conference of the Parties in Mexico, which ended on 17 December.

The plan is a compromise that emerged after developing countries proposed that the Cancun meeting adopt a decision clarifying that sequence information should be treated as physical biodiversity samples for



benefit sharing purposes. Developing countries are concerned about biopiracy promoted by the proliferation of sequences and other genetic information on the internet.

Under pressure, developed countries' negotiators acknowledged that gene sequences "are an issue to be dealt with". The European Union, Australia, and others insisted, however, that they were unprepared to negotiate in Cancun.

This reason was offered despite a preliminary exchange on the subject at a meeting of the CBD's Subsidiary Body in May 2016, and gene sequences appearing in bracketed text in the Convention's draft decision on synthetic biology. (www.twn.my, 19.12.2016)

Nepal to use Tibet roads; China sends first freight train

CHINA has agreed to allow Nepal to use its highways in the bordering Tibetan region for transportation of goods from one part of Nepal to another, according to ekantipur.com.

In a bilateral meeting at Lhasa, Chinese officials agreed to Nepal's request for using the highways along the Nepal-Tibet border via Kerung at the moment, which would be accessed via other points in the future.

Kerung, 27 km north of the Nepal-China border, is an emerging market for Nepali traders. The Chinese side is working to upgrade the road to facilitate the movement of Nepali vehicles on highways in the bordering Tibetan Autonomous Region of China.

The agreement will come into effect soon, a Nepali official said from Lhasa. Nepal faces difficulties in transporting goods across its own land due to a difficult terrain, said ekantipur.

Meanwhile, a freight train loaded with goods from Guangdong Province of China pulled out of the Dalang Railway Goods Yard in Guangzhou



on 30 November, embarking on its 54 hour journey to Kathmandu in Nepal, according to chinadaily.com.

The train will travel 6,070 kilometres through Sichuan Province, Chongqing Municipality and Tibet Autonomous Region, until it reaches Nepal's capital. Its carriages are loaded with US\$2.75 million worth of goods, including clothes, furniture, and home appliances.

On the same day, officials and business representatives from Guang-

zhou and Nepal signed a deal to build an international logistics centre which will integrate the trade services of railways, highways, and airports.

The move is expected to help upgrade the industrial structure and economic development in the region as well as deepen ties with Belt and Road countries and regions, said the chinadaily.com. (*www.ekantipur.com*, 18.11.2016 and *www.chinadaily.com*, 1.12.2016)

NTBs hinder Sri Lankan farm exports

SRI LANKA needs to reduce non-tariff barriers (NTBs) to increase agricultural exports, which account for almost a quarter of its total exports, trade experts said.

Verité Research Lanka and Fruit & Vegetable Producers, Processors and Exporters Association (LFVP-PEA) held a roundtable discussion on "Boosting Agri Exports: Reducing Domestic NTBs" at the Ceylon Chamber of Commerce.

The discussion brought together a wide range of stakeholders from both private sector and government involved in the process of agricultural trade in Sri Lanka. Verité Research, a think tank, said regulations can become NTBs that hinder exports.

The think tank presented the findings of a study on the importance of regulations in agricultural trade in Sri Lanka. The study mentions that the regulations protect human, plant and animal health and ensure the quality of imports and exports.

However, when communication with private sector stakeholders is weak, these regulations can become non-tariff barriers. Additionally, they discourage legitimate trade and increase the circumvention of trade outside regulated channels, according to the report.

Agricultural exports account for 23 per cent of total exports and is dominated by traditional commodities such as tea, coconuts, and spices, which account for 83 per cent of total agricultural exports. There is untapped export potential within agriculture in sectors such as fruit, vegetables, seafood and floriculture. (*http://www.economynext.com*, 16.12.2016.)

Ginger export to India affected yet again

EXPORT of Nepali ginger to India has been affected after Indian traders stopped purchasing the product from Nepali farmers citing eight per cent duty levied by the Indian government on Nepali farm products. Not a single truck carrying Nepali ginger left for India for some days through the Kakarvitta Customs Office.

According to Nepali traders, Indian importers have told them not to send ginger to India. Mr. Narendra Khadka, the president of the Nepal Ginger Producers and Traders Association (NGPTA), said that an Indian decision to levy eight per cent duty on Nepali ginger has discouraged importers from buying from Nepali sellers. This has affected thousands of quintals of ginger ready for export to India.

According to locals, Indian traders have to acquire a permit from the Indian customs office before placing an order for Nepali ginger upon paying eight per cent of the total import as 'permit duty'.

Three months ago, India had put a ban on ginger imports from Nepal



citing high pesticide residue. Later, lab tests showed no harmful pesticide residue in Nepali ginger. India had also alleged that Chinese ginger was being imported to Nepal in large quantities to re-export to India. The ban, however, was lifted 25 days later.

Nepali traders and farmers were already suffering from the demoneti-

zation of 1,000 and 500 Indian rupee bills. The recent imposition of new duty has brought ginger export to a complete halt. According to Indian importers, Bihar state government's customs offices have written to all India customs units to impose eight per cent duty on Nepali ginger. (*www. myrepublica.com*, 30.11.2016)

'Climate refugees in South Asia need protection'

PEOPLE forced by climate change to leave their homes in South Asia should get the same protections given to political refugees, advocates said on 8 December.

Governments in South Asia have failed to address the climate migration of millions of people, uprooted by cyclones, flash floods and other disasters, said a report by non-profit groups Climate Action Network South Asia (CANSA), Bread for the World and ActionAid. More than 46 million people in South Asia fled their homes due to natural disasters between 2008 and 2013, the Geneva-based Internal Displacement Monitoring Centre has estimated.

The region's eight nations—Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka—should formulate and adopt a treaty and policies to help protect climate refugees, said Mr. Harjeet Singh, a spokesman in India for the South Africa-based ActionAid. The eight nations also make up the South Asian Association for Regional Cooperation (SAARC) which should have policies under which people crossing borders due to environmental crises are recognized as refugees, he told Reuters.

South Asia, the world's most disaster-prone region according to the United Nations, has suffered widespread droughts, heat waves and cyclones leading to crop failures in recent years, the report said. (*https://tribune.com.pk*, 10.12.2016)

Seed bank established in Nepal village

A seed bank has been established with the initiative of local peasants in the remote regions of Wai Village Development Committee (VDC) in Bajura. Their failure to acquire seeds when needed had prompted to take such a step.

District Agriculture Development Office (DADO), ActionAid, Human Resource Centre, Bajura and Nepal Climate Change Support Organization had jointly supported the establishment of the bank.

"With the establishment of the bank, thousands of farmers of drought-hit areas are now greatly relieved," said DADO, Bajura. A seemingly endless three-year drought has hit the farmers hard.

They have been provided with seeds of paddy, wheat, millet, barley, bean and soybean, among others. Seeds of various crops and vegetables are sown at Wards 1, 2 and 3 of Wai VDC, which is supplied with irrigation facilities. Local Green Farmer's Group is operating the bank successfully.

"Besides locals of the 11 VDCs of the district, residents of Humla and Mugu frequently visit the bank for aid," said Chairperson of the collection centre Mr. Birendra Bahadur Shahi. (*https://thehimalayantimes.com*, 22.12.2016)

Nepal-India Trade Treaty renewed for seven years

THE Nepal-India Treaty on Trade and Transit has been extended for seven years from 27 October 2016 without any changes. The last revision of the treaty took place in October 2009.

The joint commission meetings led by the foreign ministers of both countries, held in New Delhi on 26 and 27 October, allowed for the automatic renewal of the bilateral trade treaty. Though the treaty will remain in place for the next seven years, its provisions can be amended or modified through a letter of exchange.

There was a debate in Nepal regarding the treaty revision to make it more contextual and to harmonize it with other multilateral and regional trade agreements. The current provision of the treaty stipulates that any preference that Nepal extends to any country will have to be extended to the southern neighbour as well. Similarly, the private sector has long been stressing for harmonizing the provisions of the bilateral treaty, especially on value addition calculation of goods and rules of origin criteria.

Another major issue that has been raised by the private sector is elimination of quantitative restrictions. The prevailing treaty imposes tariff rate quota on vegetable fats, acrylic yarn, copper and zinc oxide. However, Nepal and India are both members of the Word Trade Organization, which prohibits such tariff rate quota on manufactured goods.

According to officials, they did not pursue amendment in the treaty due to the recent obstruction in Indo-Nepal trade. For revision, one of the contracting parties must give a prior notice of three months. (*www.thehimalayantimes. com*, 27.10.2016)

India, Bhutan sign new trade treaty

INDIA and Bhutan signed a new bilateral trade agreement on 12 November to enhance trade between the two countries through trade facilitation by improving procedures.

"The bilateral agreement aims at cutting down on documentation and adding additional exit and entry points for Bhutan's trade with other countries", Commerce Ministry of India said in a statement.

The first agreement on trade and commerce between Bhutan and India was signed in 1972. Since then, the agreement has been renewed four times. (*http:// indianexpress.com*, 13.11.2016)

Pakistan lifts ban on Indian cotton

PAKISTAN has lifted an "undeclared" ban on import of ginned cotton from India, days after rejecting a consignment of 10,000 bales citing violation of plant quarantine rules by importers.

Earlier, Pakistan's Department of Plant Protection (DPP) of the Ministry of National Food Security and Research had put cotton imports from India on hold through Wagah and Karachi Port from 23 November, saying that the shipments did not fulfil phytosanitary conditions.

The rising border tensions between the two neighbours had prompted Islamabad to impose the ban on 10,000 bales of cotton worth US\$3.3 million from India.

Last year, Pakistan imported ginned cotton worth more than US\$800 million from India which accounted for two-thirds of India's cotton exports. (*http:// indianexpress.com*, 8.12.2016)

South Asia's vulnerable marine and coastal ecosystems

Our understanding of how climate change is affecting marine ecosystems, particularly for the South Asia region, is lagging.

Mohammed Mofizur Rahman and Sate Ahmad

There is a scientific consensus that anthropogenic climate change is real.¹ Even a conservative estimation projects that the global average temperature will increase between 1.5–2°C or more by the end of this century.² Climate change will have far reaching and multidimensional impacts on environment and livelihood.

Marine vulnerability

Global anthropogenic climate change has profound implications especially for marine ecosystems and the economic and social systems that depend on them. The marine ecosystem accounts for over two-thirds of the planet and provides vast resources to sustain humanity.

There are widespread evidences of the impact of climate change on terrestrial ecosystems. However, our understanding of how climate change is affecting marine ecosystems, particularly for the South Asia region, has been lagging behind. This is due to the size and complexity of marine ecosystems, measurement difficulties and limited resources available for marine research.

The latest report by the Intergovernmental Panel on Climate Change (IPCC) has synthesized the ways in which marine ecosystems have responded, and will continue

to respond, to climatic changes. Such response includes the alteration of physical, chemical and biological parameters of the ocean.3 Drivers of oceanic changes, such as salinity, circulation, temperature, carbon dioxide, oxygen, nutrients and light, determine ecosystem structures and functions by shaping the physiological performance of individual cells and organisms. For most organisms, vulnerability to warming is set by their physiology, which defines the limits of their temperature ranges and thus their thermal sensitivity. Hence, vulnerability is the highest for organisms living in the poles and the tropics such as South Asian Seas.

For tropical species, vulnerability is extremely high because most species are already living close to the upper thermal limits. It is argued that, as a result of warming, there will be shifts in the abundance, geographic distribution, migration patterns and timing of seasonal activities of species such as feeding, growth, development, behaviours and reproduction. This will be accompanied by a decrease in species' maximum body size. This has already resulted in changing species interactions, which is likely to continue.⁴

Spatially, South Asian climate ranges from a tropical monsoon in the south to a temperate climate in

the north. This variation is largely influenced by proximity to the coast, monsoon and altitude. Bangladesh, India, Maldives, Pakistan and Sri Lanka are rich in marine biodiversity. The South Asian Seas region's 12,000 km long coastline and the large marine area harbour some of the most extensive and diverse tropical marine ecosystems in the world with mangroves, coastal wetlands, seagrass meadows, coral reefs and sand dunes. The coastal and oceanic ecosystemsprovide vital services to humans. These services are currently under multiple stresses, which are increasing and creating complex, often unpredictable outcomes.

South Asia is the most densely populated region in the world, with majority of its people also being some of the world's poorest. About 135 million people are estimated to be living in the coastal zones whose livelihood is highly dependent on the marine and coastal resources such as fisheries, coastal vegetation (mangroves), coral reefs etc.

Changes in population size

Climate change can potentially impact the patterns of marine biodiversity through changes in species distribution⁵, latitudinal range⁶, local extinction risk, invasion etc., which leads



A number of marine species in this region are already considered to be under threat globally and climate change is expected to exacerbate this. It is quite likely that many species with lost habitats will also shift territory. Many of them in coastal areas could experience large population declines or changes. There might be population-level shifts because of physiological intolerance to new environments, altered dispersal patterns and changes in species interactions.

Marine and coastal fisheries play a vital role in ensuring food security and providing livelihoods, particularly for poorer sections of the community.8 However, a recent study under Ecosystem Services for Poverty Alleviation (ESPA) Delta project on the Bengal Delta projected a maximum decline of 10 per cent of the potential fish production due to elevated temperatures. At the same primary production level, an increase of 2°C in temperature can result in a 20 per cent decrease in total biomass. For Hilsha Shad (Tenualosa ilisha), a commercially important specie, even under a sustainable management practice, the catch potential is projected to decrease by 25 per cent by 2060.9

Upstream diversion of freshwater, using the Farakka barrage in Ganges River Delta, has led to an increase in salinity and decrease in transparency of water causing decreases in phytoplankton and fish, in terms of their density and diversity in the Sunderbans mangrove ecosystem.¹⁰

Looming threats

Climate change along with elevated sea surface temperature and ocean acidification are threats that loom over the region's coastal and marine ecosystems. The capacity of coastal and marine social-ecological systems to adapt to climate change impacts



is severely undermined by present human demands. These demands lead to overexploitation of resources such as fisheries and forestry; degradation of the health of coastal and marine environment; and fragmentation and pollution from both point and nonpoint sources. Such pressures erode ecological integrity and degrade the quality of ecosystem services.

To tackle the gloomy future of the coastal and marine ecosystems, climate change adaptation should be considered as a great opportunity to design innovative and transformative actions on a regional scale, across South Asian countries.

Authors are Research Investigator and Senior Research Officer respectively at Initiative for Climate Change and Health (icddr,b), Dhaka.

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Climate change haunts **South Asian livelihoods**

Out of twenty-one adaptation projects reviewed, only three local-scale initiatives in two countries (India and Bangladesh) had an explicit focus on livelihoods.

Arabinda Mishra, Abid Hussain and Golam Rasul

Which a large population and limited industrialization, South Asia¹ has remained primarily agrarian and rural. The majority of people live in rural areas and depend on agriculture, forestry, fisheries and livestock, all of which are sensitive to the impacts of climate change.

In Afghanistan, around 80 per cent of the population rely on natural resources for their livelihoods. In Bangladesh, more than three-quarters of the population live in rural areas, and many depend on the country's natural water bodies. Bhutan's economy is based on its hydropower resources, which are vulnerable to climate change impacts, especially glacier melting. In India, climate change is expected to have an adverse impact on water availability and forest-based livelihoods, while an increase in extreme events is expected to lead to an increased risk of flooding and threats to coastal areas. In the Maldives, settlements, economic activities and infrastructure are concentrated in

the low-lying coastal areas, which are highly vulnerable to climate change. In Nepal, with its largely agrarian economy, farmers are already reporting drying of mountain springs, increased duration of dry spells, higher incidence of pests and diseases and increased winter drought, while Pakistan's dependence on agriculture makes it particularly susceptible. In Sri Lanka, the economy is relatively less reliant on agriculture, but its coastal areas, water resources, cash crop cultivation and human health are vulnerable to sea level rise, extreme precipitation, increased coastal erosion, landslides and temperature rise.

Hotter, drier, wetter, saltier

Climate change projections for South Asia indicate that warming is likely to be above the global average. Monsoon precipitation is likely to become more erratic with heavy intensity rainfalls interspersed with dry spells. Climate change could threaten wetlands and fragile ecosystems in the mountains, which are already stressed by human encroachment, over-exploitation, pollution and invasive species. Heat stress could increase mortality rates; changes in precipitation patterns could result in dry areas becoming drier and wet areas becoming wetter. Coastal population could face sea level rise, salt water intrusion, increased cyclone intensity and extremes of heat and precipitation. In mountain areas, the risk of glacial lake outburst floods (GLOFs) is likely to threaten downstream settlements.

A recent assessment by the Asian Development Bank (ADB)² suggests that even under optimistic climate change scenarios, South Asia may see significant losses to GDP growth and poverty reduction. It could lose nearly two per cent of its GDP on average by 2050, rising to nearly nine per cent by 2100, under a business-as-usual (BAU) scenario. The loss is higher if damages due to extreme weather events are also included. Agriculture, coastal and marine regions, energy, water, forests and rangelands and health are the sectors most likely to be affected.

Many of the impacts in the South Asian Association for Regional Cooperation (SAARC) region are trans-boundary in nature. Glacial melts impact downstream water availability not just in Bhutan, India, Nepal and Pakistan, but also in Bangladesh. Reduced cereal yields will not just affect food producing countries but also food importers.

Livelihoods comprise 'the capabilities, assets (including both social and material resources) and activities required for a means of living'.3 Climate change can impact livelihoods through multiple pathways with risks manifested across space, over time, across assets and across households.4 Households adopt different livelihood strategies in the context of demographic trends, technical changes and policies and programmes, as well as specific shocks like drought, epidemics, and civil unrest. The strategies may comprise a set of natural resource based activities such as farming, livestock rearing, fishing and other activities like trading. Coping strategies adopted in times of crisis include sale of assets, livelihood diversification and migration.

In South Asia, the key risks of climate change—temperature rise, changes in amount and distribution of precipitation and sea level rise—will impact the nexus of water security, food security and access to energy. Threats to the viability of traditional livelihoods will exacerbate migration and heighten competition and conflict over dwindling resources hindering attainment of development goals.

Threatened livelihoods

Climate change is a threat to the agrarian population in South Asia because agriculture remains directly and indirectly dependent on the monsoon rains. An erratic monsoon regime will lead to uncertainties in agricultural productivity, drinking water availability and rural livelihoods. In Afghanistan, the National Adaptation Plan of Action notes that the country has ex-



perienced frequent spells of droughts since 1960 and that the failure of rainfed crops (80 per cent of the cultivated area) has severely marginalized rural livelihoods.

Studies indicate both positive and negative impacts of climate change on crop productivity. In Pakistan, for example, projected temperature increases of 1.5° or 3°C are expected to lead to wheat yield declines of seven or 24 per cent, respectively, in Swat District, but increases of 14 or 23 per cent in Chitral District.⁵ In India, the changing climate is projected to reduce monsoon sorghum yield by two to 14 per cent by 2020, and more by 2050 and 2080.6 A large reduction in wheat yield is projected for the Indo-Gangetic plains unless appropriate cultivars and crop management practices are adopted.7 A meta-analysis of data in 52 publications shows a projected mean reduction in maize and sorghum yields across South Asia-16 per cent for maize and 11 per cent for sorghumby the 2050s, but no mean change for rice vields.8

In mountain ecosystems, the poor eke out precarious livelihoods from farming or animal rearing on fragile slopes. Agriculture in the higher elevations is threatened by soil erosion and landslides. In the lower elevations, flooding and decay of irrigation channels are the culprits. The most vulnerable livelihoods are those of the subsistence farmers, sharecroppers and landless low-wage workers. Rangelands in South Asia, particularly in mountain areas, are also degrading, in part, due to the increased incidence of droughts. Degrading vegetation cover results in a reduction in livestock productivity further impoverishing pastoral communities. For example, a drought from 1998 to 2002 in Balochistan Province in Pakistan led to a serious shortage of water for agriculture affecting nearly two million acres of arable land and 9.3 million livestock. Food prices rose. Food security and livelihoods of nearly two million mountain people were affected resulting in reduced food consumption and migration of people.9 Continued water

stress has led to excessive pumping of groundwater further lowering the water table, especially in some parts of Balochistan. This has had a significant impact on local food systems and livelihoods.¹⁰

Salinity intrusion and possible sea level rise have already affected coastal agriculture and livelihoods of millions of people in Bangladesh. In 2007, Sidr, a super cyclone, destroyed farm lands, fisheries, shrimp farms, salt farms and other activities in its coastal districts.

Both inland and marine fisheries are likely to be hit hard by climate change. Inland fisheries are affected by floods and droughts. Marine fisheries have been badly affected as climate change adds to water retention by large dams, which further reduces freshwater outflows to the sea. As the sea level rises, the delicate fresh/salt water balance which sustains the mangroves-the rich breeding grounds for marine life-is disturbed. This natural habitat has already been degraded by human encroachment. Pollution and overfishing aggravate that. Climate change adds more by endangering the livelihoods of coastal fishermen.

In non-farm livelihoods, climate change induced extreme events such as floods have negatively affected eco-tourism, forestry and small businesses in vulnerable areas of South Asia. For example, July 2010 floods damaged most of the local resorts and hotels in tourist hotspots in Swat District of Pakistan. Thousands of people dependent on the tourism industry lost their jobs, and faced severe food and livelihood insecurity. Floods also washed out forest land, which impacted households that were dependent on forest resources for their livelihoods. The floods also damaged shops, small businesses and domestic embroidery centres.11 Severe floods in 1998, 2004 and 2007 also affected small businesses, such as textiles, garments, poultry, and agro-processing units, in Dhaka and other major cities of Bangladesh.

The Second National Communication of Maldives to the United Nations Framework Convention on Climate Change (UNFCCC) in 2016 notes the importance of the species diversity of the Maldivian reefs for the country's tourism sector and, hence, the country's economy. The coral reef damage to a popular shark dive site reduced the shark population there and, thus, the number of divers visiting the site. The resultant loss in revenue is calculated to be US\$500,000 a year.

In urban areas, climate change is impacting people's livelihoods, especially through heat-waves.12 Intense heat waves have been shown to affect the health and working efficiency of outdoor workers in South Asia and, thus, their income.¹³ Cities in the South Asian countries are also vulnerable to water- and vector-borne infectious diseases like cholera, dengue, diarrhoea and malaria. The change in climate, and the accompanying increase in anomalous weather events, is expected to result in an overall increase in the incidence of these diseases. Morbidity and deaths are projected to increase under all scenarios.¹⁴

Adapting to climate change

Climate change is also leading to an increase in the rate of outmigration from vulnerable areas such as the mountains.15 Outmigration of men for work is widespread in the extended Himalayan Region. This has led to further feminization of labour. Equally, migration has tangible benefits in the form of financial remittances. India. Pakistan and Bangladesh are among the world's top 10 receivers of remittances. In 2014, Nepal was ranked third, globally, in terms of remittances as a percentage of GDP (about 20 per cent). Whether internal or international, remittances are increasingly becoming an important source of income for the households.

> Extreme events such as floods have negatively affected eco-tourism, forestry and small businesses in vulnerable areas of South Asia.

Not all impacts of climate change on livelihoods will be negative. For example, a warmer climate and increases in atmospheric carbon dioxide may have a positive effect on forest biomass in some places. Some adaptation and mitigation measures may also provide livelihood co-benefits, for example, with the introduction of decentralized energy generation and distribution systems.

Farm households adopt various practices to be more resilient, cope with and adapt to the impacts of climate change. A large survey-based study conducted in three river basins in South Asia—Upper Indus, Eastern Brahmaputra and Koshi-showed how households had changed their farming practices and introduced new crops and livestock in response to climate effects.16 Changes in farming practices included introduction of water conservation methods, changes in sowing time and introduction of new crops that are relatively more resilient to water-stress and have a higher market value. In Nepal, farmers are shifting their cropping patterns from highly water consumptive crops like paddy to high value fruit and vegetable crops. In the Upper Indus basin, climate change has resulted in a significant degradation of pastures and rangelands. In response, livestock owners have reduced the number of larger animals and sheep and increased the number of local goats, which are more resilient to water and fodder/forage-stress.¹⁷

An examination of the national policies and adaptation programmes of South Asian countries clearly shows that the countries have not lagged behind in terms of policy formulation and launching of action on the ground, but there is widespread concern regarding effective implementation of measures. Review of their national-level climate policy documents, for most of the South Asian countries, reveals a common goal of building people's adaptive capacity by providing livelihood security in the face of climate change risks. However, the level of livelihood-focused adaptation initiatives in practice appears inadequate. Out of twenty-one adaptation projects reviewed, only three local-scale initiatives in two countries (India and Bangladesh) had an explicit focus on livelihoods.¹⁸

In general, limited access to climate change information, knowledge and services across the extended Himalayan region is a major constraint to effective adaptation. There is also a limited understanding among policymakers of what indicates a good adaptation practice, how to identify and undertake suitable adaptation interventions and how to replicate and scale up successful interventions. The role of the private sector is important in scaling up adaptation, especially for leveraging finance for technology transfer. However, most businesses in the South Asia have yet to take a proactive approach to adaptation. Few have assessed the likely effects of climate change on their own operations.

From reliance to resilience

The heavy reliance of the SAARC economies on climate-sensitive occupations will affect poverty alleviation efforts and outcomes. This is likely to hinder achievement of the Sustainable Development Goals (SDGs). Serious implications are in store for those whose livelihoods are dependent on natural resources as the distribution and productivity of these resources are influenced by climate dynamics. For the poor, who depend on climate sensitive sectors for their subsistence. climate change can pose a serious threat as even small climatic shocks could impose large and irreversible losses. More marginalized communities, such as those of tribal and indigenous people, smallholder farmers, the landless and women, are among the most vulnerable.

The significant progress in South Asia's economic growth has not yet brought inclusive livelihood opportunities for the rural poor. There is reason to be afraid that the existing social divide will further aggravate as a result of adverse climate change impacts on livelihoods. Adaptation, Reduced cereal yields due to higher temperatures will not just affect food producers but also traders.

that is transformative for livelihoods, requires innovative options and diversification strategies, accompanied by insurance-based protection. Public-private partnerships can play a role in leveraging investment for job creation in sectors that are less exposed to climate change impacts. But, this requires the creation of appropriate human resources and regulatory systems. Most importantly, adaptation should not be viewed as a stand-alone activity, it should rather be mainstreamed into existing development policies and plans.

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South Asia's **food security challenge** aggravated by climate change

Given that three-fifths of its cropped area is rain-fed, the economy of South Asia depends on monsoon rains.

Gopal Datt Bhatta

S outh Asia, home to over one fifth of the world's population with almost 40 per cent of the world's malnourished children and women, is known to be the most prone region to natural disasters. High population growth accompanied by resource degradation, rising poverty levels and food insecurity make this region highly vulnerable to the impacts of climate change and climatic variability.¹ The economies of South Asian countries are dependent on sectors that are directly impacted by climate change, such as agriculture, fisheries, forestry and tourism. Alleviating poverty and attaining food security at household and national levels is thus a major challenge in South Asia.2

Smallholder farmers in South Asia face several issues related to production and sustainability in agriculture and livelihood.3 The situation is likely to worsen with increasing climatic risks. The climatic variability and the frequency of extreme events such as heat waves, droughts, floods and timing of rainfall have increased over the past few decades and these events are fanning out to previously non-vulnerable areas.4 Some of the key climatic concerns in the region are increasing temperatures, frequent occurrence of adverse climatic events, rising sea levels, increasing cyclonic activity, higher inter-annual variability of precipitation as well as water-related hazards induced by climate variability.

Weather gods

South Asia has witnessed a significant growth in food production in the past couple of decades. However, the sector's contribution to overall GDP is declining because of rapid urbanization and diversification of income sources. Nevertheless, a significant proportion of the economically active population is still engaged in agriculture and the sector's sustainability is crucial. Given that three-fifths of the cropped area is rain-fed, the economy of South Asia depends on monsoon rains⁵.

Future climate change is likely to raise water resource scarcity, especially with enhanced climate variability and rapid melting of glaciers.⁶ This will adversely impact agriculture and will raise the risk of hunger. Countries in the Greater Himalayan Region such as Bangladesh, Bhutan, northern India and Nepal are facing increased frequency and magnitude of extreme weather events resulting in flooding and landslides. These extreme events have caused damage to property and infrastructure, devastation of agricultural crops, reduction in hydropower generation and have a negative impact on human health. At the same time, the coastal areas of Bangladesh, India, the Maldives and Sri Lanka face high

risks related to the projected sea level rise. This may cause displacement of human settlements, saltwater intrusion, loss of agricultural land and wetlands and a negative impact on tourism and fisheries.

The past and present climate trends and variability in South Asia demonstrate increasing air temperatures, which are more observable during winter than in summer. During recent decades, the observed increases in temperature in some parts of South Asia have ranged between 1–3°C per century.⁷ Decreasing trends in annual mean rainfall have been observed along the coastal belts and in the arid plains of Pakistan and parts of North-East India. Bangladesh, meanwhile, shows increasing trends (Table 1).

The linear trends of rainfall showed a decrease by 7.5 per cent between 1900-2005 in South Asia (p <0.01). Droughts have become more common in the tropics and subtropics since the 1970s.9 During the twentieth century, the changes in weather parameters led to important changes in hydrology. Another noticeable change is a decline in spring snow cover. Snowmelt started two to three weeks earlier in 2000s than it did in 1948.¹⁰ The reduction in the mass balance of the glaciers has serious implications for the availability of water for over 500 million people in South Asia.

Farmers in the region have been adapting to climatic variability throughout history. Traditional and newly introduced adaptation practices can help farmers cope with both current climatic variability and future climate changes. These adaptive practices (Table 2) emerge in relation to food production or pricing policies and marketing opportunities.

There are several motivations behind farm level adaptation: transformative learning, adapting to climatic risks, experimentation by innovative farmers, market orientation and social learning.¹¹ Some of the practices listed in the table are, therefore, not a unique response to climatic risks, such as diversifying livelihoods, but a conjoint pressure—that is, direct or indirect consequences of climatic triggers. The adaptive capacity of South Asian farmers, however, is weak and many communities are highly vulnerable.

In their everyday exploration of adaptation options, farmers have developed ways and methods to experiment innovative solutions to multiple stimuli. These solutions largely work at farm and community levels and are often supported and informed by social networks. Farmers' organizations and their institutions are viewed as the core of the innovation process as they facilitate social learning, enhance adaptive capacity in communities and implement or strengthen adaptive strategies. New adaptive strategies such as floating agriculture (waterlogged areas in coastal Bangladesh), zero tillage of wheat, direct seeded rice (DSR) and system of rice intensification (SRI) in many parts of South Asia and community-based weather stations in parts of India are part of such learning. Farmers have experimented with these innovations in the field to learn and adapt.¹²

Community forestry, communal pasture land management and farmers-managed irrigation systems in parts of South Asia initially evolved as a response to environmental problems as opposed to climate change. Over the decades, strong local institutional processes have been established to

Table 1

Past and current trends in climatic variability

Country	Temperature trend	Rain
India	0.68°C increase with increasing	Incre
	trend in annual mean tempera-	in no
	ture and more warming during	and
	post monsoon and winter	alon
Bangladesh	1°C increase in May and 0.5°C	Deca
	in Nov during 1985–1998	long
Pakistan	0.6 to 1°C increase in mean	10–1
	temperature in coastal areas	and
	since 1900s	in pre
		year
Nepal	0.09°C increase per year in Hi-	No d
	malayas and 0.04°C in Tarai	prec
	with greater intensity in winter	1948
Sri Lanka	0.02°C increase per year be-	An ir
	tween 1961–1990 over entire	and
	country and 2°C increase per	
	year in central highlands	

Rainfall trend

Increase in extreme rain events in north west during monsoon and lower number of rainy days along east coast Decadal rain anomalies above long term averages since 1960s 10–15% decrease in coastal belt and arid plains and increase in precipitation over the last 40 years in northern Pakistan No distinct long-term trends in precipitation records for 1948–1994 An increasing trend in February and decreasing trend in June

Source : Cruz et. al. (2007)8

institutionalize community-based efforts for sustainable adaptation under changing environmental circumstances, including climate change.

Research, adapt, mitigate

With climatic risks on the increase, governments in the region have started formulating policies and strategic planning to enhance the adaptive capacity of farmers. Some notable initiatives are: Bangladesh Climate Change Strategy and Action Plans (2008); Strategizing Climate Change for Bhutan (2009); National (and State) Climate Change Action Plan for India (2008); Nepal's National Adaptation Programme of Action (2010); Low Emission Climate Resilient Development of the Maldives (2012); and National Climate Change Adaptation Strategy for Sri Lanka (2011). Bangladesh has also introduced community-based adaptation (CBA) action research through a consortium of international and national research institutions. Since these were implemented only recently, their visible impact on the ground has yet to be reported.

While macro-level interventions may be able to create an enabling environment for adaptation on a broader scale, they may ignore important actors at the micro-level. Hence, there is a gap in understanding the relationship between climatic trends and adaptation outcomes at the local level. The extension systems in many countries lack enough scientific research backing, mainly, because of cultural hierarchy that prevails in the region and the lack of convergence and alignment between research, extension and farmers' efforts.

Building resilience against the impact of climate change requires identifying the risks and vulnerabilities in each sector; exploring economically sound options for adaptation (and mitigation) that are possible; and mainstreaming this process in future to ensure implementation of the necessary measures. Successful adaptation depends not only on governments but also on active and sustained engagement of stakeholders, including national, regional and local organizations; the public and private sectors and the civil society.

Table 2

Adaptation options for climate change in agriculture				
Vulnerability context	Possible adaptive options			
Drought	 Introduce drought-tolerant crops/varieties Introduce shorter cycle varieties Improve efficiency of water use Use surface water for irrigation Increase number of plantations/agro-forestry Income diversification Rainwater harvesting Intercropping and cover cropping 			
Flooding	 Introduce short-duration crops/varieties Introduce flood-tolerant crops/varieties Promote community-based seed preservation Introduce raised seedbeds in highlands and floating seedbeds in low-lying areas Construct flood-resistant infrastructure Income diversification Improve drainage 			
Changes in temperature (cold wave, heat stroke, fog etc.)	 Make changes in crops (crop diversification, emphasis on heat and cold-tolerant varieties) and cropping pattern Practice integrated crop management Adopt crop cultivation practices considering the changes in weather 			
More extreme weather	 Diversify crops/alter cropping pattern Adjust crop cultivation considering the changes in weather Facilitate drainage of runoff and create options for reserving surface water for irrigation 			
Salinity intrusion	 Domesticate marine and brackish water fish species Construct and rehabilitate climate resilient water infrastructure Introduce saline-tolerant crops/ varieties Use the raised bed system to cultivate seasonal vegetables 			

Source : Bhatta et al. 201613

The role of a national policy framework is important in facilitating the implementation of appropriate and effective mitigation measures and adaptation strategies. Such a framework will require strong institutions, adequate community participation and the development of local capacity as well as national and regional expertise. Locally appropriate methodologies must also be developed to analyze these effects and increase the understanding of current interactions among various effects including climatic, environmental and socioeconomic.

There is also a need for establishing or enhancing coordination, planning and funding mechanisms to mediate between the central government and local authorities.

The production of rice, maize and wheat, the three important crops of the region, has declined over recent decades in many parts of South Asia due to growing water stress. There is a 10 per cent decrease in rice yield for every 1°C increase in the minimum temperature during the growing season.14 While direct impacts are associated with rise in temperatures, indirect impacts due to water availability, shifting soil moisture and pest and disease incidence are likely to be felt. The most significant impact are likely to hit smallholder rain-fed farmers, the majority in this region.

Wheat yields are predicted to decline by six to nine per cent in sub-humid, semi-arid and arid areas with every 1°C increase in temperature. Even a 0.3°C decadal rise could have a severe impact on important cash crops like cotton, mango and sugarcane. In the hot climate of Pakistan, cereal crops are already at the stress margin. An increase of 2.5°C in average temperature would translate into much higher ambient temperatures in the wheat planting and growing stages.

In Nepal and Bhutan, melting glaciers are contributing to Glacial Lake Outburst Floods (GLOFs).15 Rapid depletion of the water resource will affect about 2.5 billion people-water stress and scarcity-by 2050 in the region.¹⁶ These challenges are usually aggravated by periods of prolonged droughts and/or floods and are often severe during El Niño events.

In South Asia, there could be a significant decrease in non-irrigated wheat and rice yields whenever the temperature increase is greater than 2.5°C. This could incur a loss in farm-level net revenue between nine per cent and 25 per cent. One study points out that, in Bangladesh, the production of rice and wheat might drop by eight per cent and 32 per cent, respectively, by 2050. Studies show that a 0.5°C rise in winter temperatures could reduce wheat yield by 0.45 tons per hectare in India. Other studies suggest a two to five per cent decrease in Indian wheat and maize yield potentials for temperature increases of 0.5-1.5°C.17

Changes in timing and amount of precipitation increase the likelihood of short-run crop failures and long-run production declines. A simulation of an extended drought was done by International Food Policy Research Institute (IFPRI) for the 2030-2035 period. It saw that the effects of droughts in South Asia would spill



over into world markets. World prices for rice, wheat and maize showed a sharp increase during drought.¹⁸ Food security of smallholder farmers would naturally take a bad hit.

Climate change does not respect national boundaries. The coping capacity of smallholder farmers is poor. There is a need to include good adaptation practices into the region's planning mainstream. An improved understanding of climate change could help this process. Given such rich adaptive innovations of South Asian agriculture, the focus of support should be on strengthening location-specific adaptation strategies and low cost technologies for farmers.

Mainstream resilience

There has definitely been some progress in formulating national adaptation strategies in South Asia. However, policy, research and extension systems give inadequate attention to developing systemic resilience. As a result, productivity-focused interventions receive greater attention at the cost of resilience-enhancing strategies.

Public and private investments are needed to help poor households adapt to climate change. These could include direct investments in agriculture productivity—such as in crop breeds better suited to new climates; in improving the physical and market infrastructure; or in strengthening the social safety nets to help poor households maintain their welfare in the event of a livelihood shock. While the optimal composition of investments will likely vary by country, scientific research can contribute important information concerning where climate change will hit hardest, what strategies to be hammered out, how agricultural systems are likely to respond and what particular investments in adaptation could yield higher returns.

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Regional cooperation to meet **climate pledges** of South Asia

Climate cooperation has been discussed for long, but little is achieved on the ground in South Asia. The Paris Agreement is an opportunity to renew the commitments.

Nitya Nanda



limate change first appeared in the official discourse of South Asia during the Fourteenth South Asian Association for Regional Cooperation (SAARC) Summit held in New Delhi in April 2007, which called for a climate resilient development in the region. The Fifteenth Summit held in Colombo the next year adopted the Colombo Declaration entitled "Partnership for Growth for Our People," in which the Heads of State and Government reiterated the need for increased regional cooperation in tackling climate change. The focus was on capacity building, development of Clean Development Mechanism (CDM) projects and awareness campaigns. At the initiative of Bangladesh, an expert group meeting on climate change and a SAARC Ministerial Meeting on Climate Change were held. What came out of the process was a Regional Action Plan on Climate Change adopted in July 2008, which emphasized coordinated regional actions in some thematic areas (Box 1).

Specific areas of action were to be identified in the Regional Action Plan according to the priorities outlined and actions envisaged in the national action plans of the Member States. However, in April 2010, when the leaders of South Asia met during the Sixteenth SAARC Summit, it was quite obvious that nothing had moved on the ground even two years later. A special statement on climate change was issued then, which established a range of institutional mechanisms to implement the Regional Action Plan. Almost seven more years have passed since then, yet one wonders what has been achieved in terms of regional cooperation on climate change except for a series of meetings.

Issues in the backseat

While the issue of capacity building for international negotiations was the last theme in the agenda of the regional action plan on climate change in South Asia, this was actually the main issue that most countries in the region have been grappling with. All other issues related to climate change took a backseat as the member countries of SAARC were deeply engaged with the United Nations Framework Convention on Climate Change (UN-FCCC) process. While all South Asian countries have been a part of the G77 group that had a common position on climate negotiations at the UNFCCC, they had serious differences among themselves on some important issues.

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (AR5 IPCC) assessed that South Asia is one of the most vulnerable regions and that the impacts are already being felt. Changing patterns of rainfall and rapidly melting snow are impacting the freshwater system in the region. In future, human settlements will be flooded, agricultural productivity affected, food and water scarcity widespread and both quantity and quality of water availability affected in the region. Changes in temperature and monsoons will also impact the health and disease dynamics affecting not only humans but the animal population as well.

Environmental impacts do not follow national political boundaries. Just as there are issues that need a global arrangement to be addressed effectively, there are issues that need to be handled at the regional level as well. This is more so in the context of adaptation. While the Paris Agreement has been hailed as a success, there has always been a measured sense of scepticism too about whether it did enough to protect the climate. South Asia represents an ecological system where regional cooperation becomes important in dealing with climate change.

The Paris Agreement can impact South Asia through several channels which are not likely to be similar for all countries in the region. The impacts on different countries will be contingent upon their level of commitment, on the one hand, and their vulnerabilities to climate change, on the other. At a broader level, the impacts will be felt mainly through the three channels as listed in Box 2 (next page).

Mitigation commitments

The core of mitigation commitments relates to the energy sector. Bangladesh has pledged to reduce its emission by five per cent of its 2030 business as usual (BAU) level, unconditionally, which can go up to 15 per cent if enough external support can be ensured.¹ Bangladesh and India are facing the challenge of meeting a surging demand for energy, affordably and sustainably. Mitigation commitments are going to restrict their choices in meeting that demand.

Sri Lanka intends to reduce the greenhouse gases (GHG) emissions

against a BAU scenario, unconditionally, by seven per cent, which might go up to 23 per cent if enough additional resources are provided by external sources.² Similarly, the Maldives committed itself to reduce 10 per cent of its GHG on its own below the BAU scenario by 2030, which can go up to 24 per cent with enough external support³. The two countries are likely to meet their mitigation commitments.

Nepal intends to reduce its dependency on fossil fuels by 50 per cent and wants to generate 4,000 MW of hydroelectricity by 2020 and 12,000 MW by 2030. Additionally, it also wants to generate 2,100 MW of solar energy by 2030. The situation of Nepal is quite unique. Along with a low level of economic development, its current energy access scenario is quite grim. It has made an ambitious commitment to increase generation of hydroelectric power as well as solar and other forms of renewable energy. If Nepal is able to meet its targets, that will bring enormous socio-economic benefits to its people. Nepal's plan to equip every household in rural areas with smokeless (improved) cooking stoves by 2030 will not only add to mitigation but will bring substantial social benefits.⁴ These targets will be difficult to meet, but the difficulties will not come from commitment to reduce emissions.

Bhutan is a carbon-neutral country and it will be quite easy for it to remain that way. The fact is that it has a huge hydropower potential, rea-

Box 1

Climate change thematic areas

- Adaptation to climate change
- Policies and actions for climate change mitigation
- · Policies and actions for technology transfer
- Finance and investment
- Education and awareness
- Management of impacts and risks due to climate change
- Capacity building for international negotiations

Source: SAARC Regional Action Plan on Climate Change (2008)

Box 2

How South Asia is impacted

- Economic and social challenges that will arise from individual country's mitigation commitments;
- Ability or inability of the Paris Agreement to limit the temperature rise below a specific level which will impact their burden of climate change adaptation; and
- Kind of finance and technology transfers that might be facilitated by the Agreement.

Source: Author's projection

sonably good energy access scenario, a huge forest cover and a limited population. It is in the most comfortable position to meet its mitigation commitments.

In South Asia, Afghanistan and Pakistan are the only countries that have not made any unconditional mitigation commitments. Pakistan intends to reduce up to 20 per cent of its 2030 projected GHG emissions subject to availability of international grants to meet the total abatement cost, which is estimated to be about US\$40 billion.5 Afghanistan intends to reduce its GHG emissions by 13.6 per cent by 2030, compared to a BAU scenario, entirely conditional on external support.6 Pakistan's lack of commitment has attracted criticism from domestic constituencies as well. Obviously, these two countries will not see any impacts from their mitigation commitments.

Effectiveness of Paris Agreement The effectiveness of the Paris Agreement to address climate change has always been a concern. The ascendance of Donald Trump to the United States Presidency and his scepticism regarding climate change have added to the concern. In this context, all South Asian countries are in the same boat. The notion that different countries will have differential impacts might only be a question of perspectives, while the Maldives is facing an existential crisis, the sheer enormity of the problem in India makes it no less of a challenge. India has a long coastline and huge stretches of low lying

areas and, a large part of the country is suffering from water stress. Add to that an extensive stretch of ecologically fragile mountainous areas and a huge population that is going to reach the 1.5 billion mark, whose food and health security need to be ensured.

Half of Bangladesh is in low lying areas facing the threat of inundation due to climate change. It is a victim of extreme weather events and related disasters, which are going to rise with climate change. Ensuring food and health security will pose an enormous challenge in the context of impending climate change.

Much of the land in Sri Lanka is either coastal or low lying which is highly susceptible to extreme weather events like storm surges or landslides in ecologically fragile mountainous areas. The vulnerability of Afghanistan is very high in terms of potential impacts of climate change. Extreme poverty makes its people even more so. Pakistan is the most water-stressed country in the region and it is already feeling the impacts in agriculture. Hence, maintaining food security could be a huge challenge for the country.

> The Bay of Bengal gets freshwater from mighty rivers affecting its salinity level. And, huge cloud-bursts could change that.

Nepal is an ecologically fragile mountainous country with a high probability of impending climate related disasters. It already suffers from a fragile food security situation and widespread poverty indicating a very limited coping mechanism. While the mitigation scenario looks rosy for Bhutan, the fact that it has no role to play in climate change does not mean that it will remain aloof from its impacts. The entire country is ecologically sensitive and extremely vulnerable to climate-related disasters.

External assistance

The cost of mitigation that South Asian countries have committed themselves to, particularly the conditional type, is likely to be quite high. Most countries of South Asia have not yet been able to make an assessment of their mitigation and adaptation costs. Moreover, while some countries have assessed some of their mitigation costs, a comprehensive assessment of adaptation costs is still lacking. This is because a country can make a mitigation plan but its adaptation needs will still remain uncertain. At best, some countries have made some sector-specific or activity-based assessment of their adaptation costs. Nevertheless, the costs of adaptation in South Asia as a whole is likely to be huge and the countries will find it extremely hard to mobilize the necessary resources domestically.

Afghanistan has calculated a financial need of about US\$17.405 billion (2020–2030), of which US\$10.785 billion is for adaptation and US\$6.62 billion is for mitigation.⁷ Pakistan has indicated a figure of about US\$40 billion (at current prices) for mitigation and an amount ranging from US\$7 to US\$14 billion per annum for adaptation.⁸ Bangladesh has indicated that adaptation needs related to some sectors and activities will cross US\$40 billion.⁹

According to some estimates, India is already spending about US\$100 billion a year for adaptation, which is likely to reach US\$360 billion a year by 2030.¹⁰ According to another estimate, India's emission-intensity reduction targets and adaptation to climate change will require about US\$2.5 trillion by 2030, not to mention an array of technologies.¹¹

The cost of adaptation in Nepali agriculture could be about US\$20,000 per village, excluding the costs that might be incurred at the national or district levels.¹²

A study conducted by the Asian Development Bank says that, in a BAU scenario, South Asia could lose 1.8 per cent of its annual GDP by 2050, which will progressively increase to 8.8 per cent by 2100. It also suggests that even if the temperature rise can be contained within 2°C, the region would lose an average 1.3 per cent of GDP by 2050 and roughly 2.5 per cent by 2100. The Maldives will be the hardest hit with a 2.3 per cent loss in GDP, while Bangladesh, Bhutan, India, Nepal and Sri Lanka are projected to face 2 per cent, 1.4 per cent, 1.8 per cent, 2.2 per cent, and 1.2 per cent, respectively, in annual GDP losses by 2050.13

It needs to be recognized that monetary costs of climate change are only a small part of the total costs as they will not adequately capture the suffering of the people. They will need to be considered as well.

At Copenhagen, developed countries had already committed US\$100 billion a year for climate finance by 2020. The Paris Agreement did not make any explicit commitment to any amount of finance to be mobilized. The Paris Decision, however, "strongly urges developed country Parties to scale up their level of financial support, with a concrete roadmap to achieve the goal of jointly providing US\$100 billion annually by 2020 for mitigation and adaptation" (para 115). The Decision also mentions that, prior to 2025, the Conference of Parties shall set a new 'collective quantified goal from a floor of US\$100 billion per year' (para 54). The Paris Agreement, thus, did not do anything additional in terms of climate finance that might flow to South Asian countries. There is also ambiguity over what constitutes climate finance. When South Asian

countries are talking about climate finance, they are actually talking about public external aid coming to their countries and not private investment in sectors linked to climate change.

It is quite unlikely that South Asian countries are going to get the kind of external assistance they are looking for. Smaller countries like Afghanistan, Maldives, Sri Lanka and Bhutan, can meet a sizeable proportion of the costs of adaptation and mitigation from external finance. For countries like India, Bangladesh, Pakistan and Nepal, the external assistance they might get is likely to be miniscule compared to their overall needs despite the fact that Bangladesh and Nepal are also the least-developed countries. This will mean further deviation from mitigation targets leading to greater needs for adaptation. Hence, regional cooperation is needed. It is thus important to highlight some key areas of adaptation for South Asian countries for regional cooperation in South Asia.

Water resources

South Asian countries are home to about one-fourth of the world's population, but only contain about 4.5 per cent (1,945 billion m3) of the world's annual renewable water resources (43,659 billion m3). The Hindu Kush Himalayan region is amongst the largest storehouses of fresh water in the world, and constitutes the primary source of water for about 700 million people in South Asia. While some parts of India and Bangladesh are already in stress, in Pakistan, the overall withdrawal of fresh water is already unsustainable due to overexploitation of groundwater. Fresh water utilization is more than 15 per cent in the Ganges-Brahmaputra-Meghna (GBM) basin, but it is more than 90 per cent in the Indus basin. While the region gets significant rainfall, there are wide spatial and temporal variations. Because of this, countries in the region depend heavily on ground water affecting the lower riparian regions in many ways.

Deforestation and degradation of forest along with climate change have been blamed for increased frequency of cloud bursts in the Himalayan regions. Such events cause problems not only in the hills but also in the plains below through floods and sudden release of excessive sediments. The frequency and intensity of such events have increased. The GBM delta is the home of the famous Sundarbans with its unique ecosystem, which is threatened not only by possible sea level rise, but also by the flow of the GBM rivers, apart from urbanization and aquaculture.

The salinity balance of the oceans plays an important role in the complex





interactions between the atmosphere and sea. The Bay of Bengal gets a huge discharge of freshwater from several mighty rivers including GBM, Mahanadi, Godavari, Krishna and Kaveri from South Asia and also from Irrawaddy in Myanmar. As a result, the salinity level of surface water in the Bay is low. This low-salinity surface water allows the Bay to remain warm and sustain cloud systems. While the recent increase in frequency in storm surges in the region is often attributed to climate change, it is also important to consider the issue of change in salinity balance that might have been occurring.

Moreover, this low salinity and the total organic carbon deposited by these rivers have created a unique marine ecology in the Bay, which also has the world's largest submarine fan. This has made the bay a bio-diversity hotspot. Lack of adequate flow or any change in the flow pattern can seriously harm this marine biodiversity. The need for basin-wide management of rivers cutting across political boundaries is accepted in principle, but hardly implemented in practice, particularly in South Asia.

Agriculture and food security

Food security has been one of the major challenges that the region has been facing. The countries have undertaken significant technological interventions. Much of the technology is imported. Such technologies have also created problems adding stress to the long run sustainability of the agricultural sector itself. Existing technologies, methods and practices can be useful in addressing adaptation challenges. There is a huge scope for the pooling of research and technological capabilities.

Disaster management

The entire region is not going to be hit by a single disaster any time soon. But when more countries are hit, smaller countries may find their response paralysed by the disaster, unable to help others. South Asian cooperation exists, but more on an ad hoc basis. There has also been some institutionalized response to promote cooperation on disaster management which needs substantial strengthening.

Health impacts

Existing diseases might spread further or increase in intensity with climate change. New diseases might also emerge. Since people of different countries share similar biological profiles, climate change might create similar health impacts. Hence, there is a case for collaborative health research. This would also mitigate the challenges from health research in other parts of the world bypassing the health needs of the South Asian population.

Friends in need

South Asian countries are unlikely to get access to sufficient external resources to deal with climate change. This calls for countries to help each other through regional cooperation. Such cooperation has been discussed for long, but little has been achieved on the ground. One important way to start would be to initiate a few climate related projects under the SAARC Development Fund by expanding its mandate.

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Regional response to climate change in South Asia

Chatura Rodrigo

limate change is transforming the way countries plan economic and human growth. They have begun to implement micro and macro initiatives to minimize the negative outcomes.1 While developed countries are more capable of adapting to and mitigating climate change effects in terms of financing and technology, their developing counterparts have to rely on global funds and small-scale local interventions. They also see collective action as an important agenda in this fight.² The South Asian Association for Regional Cooperation (SAARC) provides an effective platform for such action in South Asia.3

Much to do

The Paris Agreement aims to strengthen the global response to this common threat by keeping global temperature rise in this century well below 2°C above pre-industrial levels, even while making efforts to limit the increase further down to 1.5°C.⁴

It also aims to strengthen the ability of countries to deal with climate change impacts. Developing countries, especially the most vulnerable ones, are thus assured of support even to meet their own national climate objectives.

The Paris Agreement seeks enhanced transparency of action by requiring all Parties to put forward their best efforts through "nationally determined contributions" (NDCs) and regularly report the status of their implementation progress. A global stock-take every five years will assess the collective progress and inform Parties on further individual actions.⁵

Meanwhile, the European Union (EU) alone is a major contributor to the fight against climate change. The European Commission issued the first Community strategy in 1991 to limit carbon dioxide (CO2) emissions and improve energy efficiency.⁶

For Europe, a comprehensive package of policy measures to reduce greenhouse gas emissions (GHG) was initiated through the European Climate Change Programme (ECCP) in addition to domestic actions that build on the ECCP measures.⁷

However, the Kyoto protocol required cutting emissions down to eight per cent below 1990 levels between 2008-2012. The Commission launched ECCP in July 2000 with the objective of identifying and developing EU strategy to implement the Kyoto Protocol. The second European Climate Change Programme (ECCP II) was launched in October 2005.

The EU has set targets for GHG reductions for up to 2050. In 2015, the EU was responsible for 10 per cent of world's greenhouse gas emissions. It reduced them by 22 per cent between 1990 and 2015, a period when the economy grew by 50 per cent.

The EU is drafting laws to achieve its Paris commitment to reduce emissions by at least 40 per cent by 2030 from the 1990 levels. They include tightening of the EU emissions trading system (ETS) after 2020; binding emissions targets for member states for sectors outside the ETS for the 2021 to 2030 period; and the inclusion of land use and forestry into the EU's emission-reduction efforts for the same period. Innovation and energy efficiency are the main drivers behind the recent reductions.

The EU also helps developing countries implement their Paris com-

cover feature

mitments. In 2015, its climate finance contribution increased by more than 20 per cent to €17.6 billion.

While EU provides a good example of regional response to climate change, it took a number of summits for SAARC just to focus attention on climate change issues.8

The 14th SAARC Summit held in 2007 expressed "deep concern" over global climate change and called for a climate resilient development of South Asia. The 29th session of the SAARC Council of Ministers felt that there was a need to ensure rapid social and economic development to make South Asia climate change resilient. Later, a Ministerial Meeting on Climate Change, held in Dhaka on 3 July 2008, adopted the "Dhaka Declaration and SAARC Action Plan on Climate

Change". The 16th SAARC Summit (28-29 April 2010) adopted the Thimphu Statement on Climate Change.9

For want of ambition

The Dhaka Declaration and the Thimphu Statement have three broad themes: expansion of education and awareness, joint research and capacity building and joint programme implementation (Table). These themes cover measures related to adaptation, mitigation, technology development and deployment and joint mobilization of resources.¹⁰ The current mandates are to develop a research database to bridge the knowledge gaps in the region.11

Many of the elements of the SAARC declarations resonate well with the region's needs, although

these could have been more ambitious. However, the two declarations have not taken into account some of the past recommendations, including the "Vision document" put together by the Group of Eminent Persons in 2000.

Although repeatedly mentioned in SAARC documents, including in the climate change discourse, mutual cooperation and joint initiatives for knowledge sharing and implementation of programmes is dismal in the region. On 17 March 2016, the 37th session of the SAARC Council of Ministers failed to reach an agreement to come up with concrete plans to mitigate climate change effects. A common approach to minimizing dependence on fossil fuels in response to the Paris talks was needed. Exchange of ideas and adaptation plans and practices in

Table

Climate change thematic areas of SAARC					
Thematic areas	Dhaka Declaration (July 2008)	Thimphu Statement (April 2010)			
Capacity building and Clean Development Mechanism (CDM)	To cooperate in capacity building and incentives for removal of GHG by sinks	To establish Inter-governmental Expert Group on climate change to develop policy direction and guidance for regional cooperation in line with the SAARC Action Plan on Climate Change			
Education and awareness	To promote advocacy pro- grammes and mass awareness campaigns	To launch advocacy to promote low-carbon development. Incor- porate science-based school materials for better understanding of climate change effects.			
Financial resources for SAARC programmes	N/A	To explore the feasibility of a SAARC mechanism to provide capital for low-carbon projects and renewable energy			
Joint implementation of projects	To initiate programmes and measures for adapta- tion to protect lives and livelihoods	To plant ten million trees over the next five years (2010–2015) as part of a regional campaign. Evolve plans and projects to protect ar- chaeological and historical sites from climate change			
Regional joint research and development, shar- ing of knowledge and information, and south- south cooperation for technology develop- ment and deployment	To exchange information on best practices, share results of research and de- velopment to mitigate the effects of climate change, and to undertake adapta- tion measures	To set up various intergovernmental SAARC institutions such as the Low-carbon Research and Development Institute in South Asian University, Marine Initiative with support from the SAARC Coastal Zone Management Centre, Mountain Initiative to be supported by the SAARC Forestry Centre, Monsoon Initiative to be supported by the SAARC Meteorological Research Centre, Climate-related Disas- ters Initiative to be supported by the SAARC Disaster Management Centre; To establish linkages among national institutions for sharing of knowledge and capacity-building; To commission a study on climate risks in the region			

Source: Author's compilation from various SAARC documents

similar areas would have given them a common agenda.¹²

The Climate Action Network South Asia (CANSA) doubts whether activities to address the knowledge gaps, capacity building and training have met the objectives. Regional capacity building initiatives do not seem to have linkages with national initiatives. There is no monitoring and evaluation of projects. Instead of designing and implementing joint programmes, the SAARC Secretariat holds events with no significance.¹³

On the financial front, the action plan failed to mobilize even the bare minimum of funds. Building resilience, agriculture and energy are crucial areas where SAARC needs to act jointly. The CANSA assessment also prioritizes special SAARC measures for the least-developed countries (LDCs).

On a global level, SAARC, as an observer to the United Nations Framework Convention on Climate Change (UNFCCC), has started to intervene in climate negotiations with a common voice. To be noted is that SAARC members are at different development levels making it difficult to devise a common negotiating position.

All SAARC countries are members of the biggest negotiating group: 'G77 & China'. India, Pakistan and Sri Lanka fall in the developing category while Afghanistan, Bangladesh, Bhutan, Maldives and Nepal are LDCs. They have different sets of defensive and offensive interests in the negotiations. In November 2013, the Warsaw Conference of Parties (CoP) clearly demonstrated how India, as a member of BASIC (Brazil, South Africa, India and China - or so called major emitters), Pakistan, as member of Like Minded Group, and Nepal and Bangladesh, as members of LDC Group, negotiated their own interests. For the first time in history, 'G77 & China' failed to devise a common position on upcoming agreements.14

Considering the common vulnerability and diverse stages of development, SAARC must focus on the following¹⁵: As a major counterpart in the global fight against climate change, the EU is setting examples for other regions regarding cooperation.

- Influence national governments to enforce climate policies and programmes
- Identify areas of common interest for joint regional projects
- Clarify the special and differentiated rights and obligations of countries with different levels of development by participating in various international negotiations
- Monitor national and regional programmes and projects and harmonize policies, laws, agreements.
- Increase financing to implement decisions. SAARC Development Fund must open windows for disaster risk reduction, climate change adaptation/mitigation and agriculture and food security.
- Make decisions legally binding; open and transparent report-back mechanism
- Make SAARC inclusive of civil and political societies in its processes.
- Implement the SAARC Natural Disaster Rapid Response Mechanism (NDRRM) to facilitate inter-country rapid response during emergencies to save lives.
- Form a common SAARC position for the international climate negotiations.

Inclusiveness, cooperation

Regional collaboration and cooperation are necessary against climate change impacts. Partnerships between state and non-state actors are crucial in promoting peoples' interests. With these, SAARC can effectively address the gaps in cooperation, financing and technology needed to address climate change impacts. The Paris Climate Agreement presents a good opportunity for joint regional response to climate change in South Asia.

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Future of multilateral climate finance

Although smaller in amount, public finance plays a critical role as it is essential for public goods and services that the private sector is unwilling or unable to support.

The amount of investment needed to achieve the ambitious goals of the 2015 Paris Agreement lies in the trillions of dollars. By far the largest sums of capital lie with the private sector, and aligning these investment funds with climate and sustainable development goals is crucial.

Although smaller in amount, public finance also plays a critical role as it is essential for public goods and services that the private sector is unwilling or unable to support. When deployed effectively, public finance can catalyse private investment as well.

Funding channels

A rich and varied architecture of public institutions is involved with raising, channelling, and deploying finance for climate-related activities. These funds and institutions follow bilateral and multilateral channels and use a variety of instruments. Among them, multilateral climate funds play a key role in using international public finance to stimulate the shifts in investments by other public and private finance institutions that are necessary to drive a broader economic and societal transformation.

A recent report "The future of the funds: Exploring the architecture of multilateral climate finance" by the World Resources Institute argues that only transformation at a global scale will be sufficient to reduce emissions and improve climate resilience in order to meet international climate and sustainable development goals. According to



the Report, multilateral climate funds face a number of challenges to realize their full potential. Over the last two decades, the multilateral climate funds have witnessed some overlapping of roles and duplication of effort. Policymakers are now concerned about ways to improve coherence and complementarity to enhance effectiveness.

Additionally, the future direction and role of some multilateral funds is unclear which have led to debate in contributor countries regarding where to allocate public resources, and in recipient countries regarding which funds to prioritize their engagements with.

The Report identifies five key strategies that multilateral climate funds should pursue if they are to be effective in supporting transformative change (see Box).

The challenges include issues related to structure, resources and operations. Policymakers have an opportunity to make changes to the funds to ensure that their impact is positive and responsive to the evolving needs of developing countries.

The Report proposes that the multilateral climate funds undertake a set of reforms. The recommendations suggested are divided along their operational and architectural lines.

Operational recommendations

Coordinated approach

Funds could improve their coordination to ensure that they meet countries' diverse needs, minimize duplications and inefficiencies in their portfolios and simplify access to funding. This would require funds to think strategically and collaboratively about who is best placed to serve different thematic and geographic areas, who should support which activities and how needs will evolve over time. Funds could improve coordination by having their secretariats and boards engage with each other more closely. At the country level, programming and planning need to be holistic and not limited to a fund-specific portfolio. One possible solution is for countries to identify one ministry or body that serves as the national focal point for all the climate funds. There is also a need for more coordinated readiness support and capacity building than is

being provided by the funds and their readiness partners.

Harmonized standards

The funds currently use a multiplicity of rules and procedures to access finance. This results in considerable inefficiencies for implementing entities, particularly national entities with less capacity. Funds could agree on a consistent set of fiduciary standards, environmental and social safeguards and gender policies that apply across all funds. Standardizing accreditation and funding proposal procedures would also be a significant improvement. In addition to increased efficiency, transparency might also improve with such changes.

Programmatic approach

Transformation will not occur if the bulk of financing goes to one-off projects that do not catalyse more systemic change at national, regional, and, ideally, global levels. Funds should support systemic shifts by strategically investing in policy initiatives or actions that have the potential to change behaviour in markets and economies beyond the confines of specific activities. Programmatic approaches, which typically involve bundling or aggregating activities that contribute holistically to a particular outcome, are a useful approach.

Architectural recommendations

These recommendations can be implemented in short term and long term. The short term includes division of labour and specialization of funds with a view to reducing inefficiencies. Some funds can support impact at scale by focussing on their traditional strengths and catalytic mitigation interventions. There are also areas like support for programmatic approaches, systemic shifts for mitigation and capacity building. Supporting the least-developed countries (LDCs) is another area that requires specialization where several funds can complement each other in providing small scale short term funds. Thematic allocation may also require some funds to divest some of

Box

Five key strategies

- Achieve impact at scale: Trillions of dollars in investment are needed to address climate change, and multilateral climate funds should play a key role in scaling up climate finance by deploying their resources catalytically to mobilize larger flows of funding that achieve systemic change.
- **Promote country ownership:** Funds should ensure that finance is being channelled to support nationally determined priorities and strengthen national capacities.
- Improve efficiency: Funds should pursue greater efficiency.
- **Support equitable allocation:** Funding should be fairly allocated to reach developing countries with the greatest need.
- Increase accountability: Funds should improve processes.

their traditional areas like technology transfer or adaptation to more specialized ones.

The longer term recommendations pertain to closing or consolidating some funds if clarifying the division of labour is not sufficient to address inefficiencies and the overlaps between funds. In doing so, it is important to ensure that key roles played by funds are not lost in the transition. Stakeholder opinions should also come to play here in choosing which funds to keep and which to close. The Conference of Parties and Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement could revisit their mandates and relationships as discussions evolve over time. In sunsetting of funds, care should be taken so that the available resources are not reduced, especially in areas that already suffer from shortages like supporting the LDCs. In cases where activities like adaptation are re-allocated among specialized funds, the traditional funds can continue to exist to focus on their niches, while those who have taken up the former's mandate can take up the larger projects.

Overall, closing and consolidation could bring in efficiency but also reduce choice. Consolidation has implications for the remaining funds. Their capacity to meet developing country needs, staffing and mandate also need to be strengthened. Even though the larger ones may have the potential to absorb the roles of most other funds, they might not yet be fully in a position to do so. Larger funds that absorb others will require expanding their current mandates as well, for example to include the needs of LDCs.

Varied options

The Report suggests a set of reforms, with changes in the shorter term (2–3 years) focused on improving the coordination and specialization of current funds while, in the longer term (4-8 years), funds are closed or consolidated. The recommendations are not necessarily mutually exclusive, nor are they the only options worth considering. Policymakers and other decision-makers must think strategically and carefully about how the architecture of climate finance should evolve. Governments will need to consider different funding options, in collaboration with other stakeholders, including civil society, private sector actors and implementing entities. Decisions over the next decade must drive the systemic shifts necessary to respond to the urgency of the climate challenge.

Adapted from the World Resources Institute's recent report "The future of the funds: Exploring the architecture of multilateral climate finance".

Emission trading for South Asia

South Asian countries have the potential to attain higher welfare gains from the global emission trading market.

Muhammad Zeshan and Jong-Hwan Ko

Each year, the world witnesses a number of extreme episodes attributed to climate change. They result not only in great losses of human lives, but are also detrimental to livelihood and economy.

According to the Climate Risk Index (CRI) ranking of 2014, four South Asian countries—Afghanistan, Pakistan, Nepal and India—are among the ten most affected countries (see Table 1). Moreover, among the world's ten most affected countries during 1995–2014, nine were developing countries in the low- or lower-middle income groups. The 2015 Paris Climate Summit has offered some credible hope by pledging to reduce greenhouse gas emissions to tackle extreme climate events. However, for the developed countries, meeting the commitment made at the Paris Summit would mean compromising their economic activities. Even so, emission trading between less polluting poor and developing countries and the developed countries could help developed countries offset this loss.

Emission trading allows countries to buy (sell) the right to carbon emission from (to) another country. As a result, a country can increase its carbon emission to the level higher than the commitment made during the Paris Summit. This article looks into the potential economic impact on carbon emission targets with and without emission trading. The difference thus obtained depicts the impact of emission trading on countries—developed and developing alike.

Top polluters

Six countries—China, the United States, India, Russia, Japan and Germany—produce almost 60 per cent of the total global CO2 emissions. China

Table 1

Climate Risk Index (CRI): 10 most affected countries in 2014

climate hisk mack (ehr). To most anceted countries in 2014							
Ranking	Country	CRI	Death toll	Deaths per	Absolute losses	Losses per	Human Devel-
		score		100,000 inhabitants	(million US\$ PPP)	unit GDP (%)	opment Index
1	Serbia	8.17	59	0.82	3,300.30	3.44	77
2	Afghanistan	10.67	434	1.38	337.08	0.55	169
3	Bosnia and	11.50	26	0.67	3,584.77	9.36	86
	Herzegovina						
4	Philippines	12.50	328	0.32	3,312.68	0.47	117
5	Pakistan	12.67	1,227	0.65	2,220.52	0.25	146
6	Bulgaria	13.83	31	0.43	2,383.60	1.84	58
7	Nepal	15.83	533	1.89	143.10	0.21	145
8	Burundi	16.00	80	0.86	73.38	0.87	180
8	Bolivia	16.00	47	0.41	449.45	0.63	113
10	India	16.17	1,863	0.14	36,950.50	0.49	135

Source: Kreft, Eckstein, Dorsch & Fischer (2016)¹

and the US together produce over two-fifths of the total global CO2 emissions. China alone produces about 30 per cent, which is twice that of the US. It had surpassed the US as the top CO2 emitter in 2006.

India accounts for almost 90 per cent of the total carbon dioxide emitted in South Asia. Pakistan, Bangladesh, Sri Lanka, and Nepal contribute a negligible amount of around 7.1, 2.5, 0.7, and 0.2 per cent, respectively (see Figure).

There are three basic sources of CO2 emissions in South Asia: natural gas, coal and petroleum products. India is the biggest source of emissions associated with the consumption of natural gas, while Pakistan and Bangladesh stand at second and third positions, respectively. In 2013, India added around 104 million metric tons of CO2 in the environment, while Pakistan and Bangladesh added around 65 and 45 million metric tons respectively.

India is also the biggest emitter of coal induced CO2. Over 1,280 million metric tons of CO2 were emitted in 2012, while other South Asian countries contributed very negligible amounts. CO2 emissions from petroleum products, too, show that India adds the highest amount from South Asia to global emission compared to the combined total of the rest of South Asia.

End of fossil fuel era

Paris Summit 2015 was the first time when more than 190 governments signalled the end of the era of fossil fuel consumption. Our recent study³ discusses the CO2 emission reduction targets committed in the Paris Summit 2015—also known as the Intended Nationally Determined Contributions, INDCs⁴—and analyses its global economic implications.

This article is an extension of the same study with a focus on South Asia using the GTAP-E model and the GTAP-E Version 9 satellite database released in February 2016. This database includes a dataset of 140 regions and 57 sectors for each region.

Figure



Source: World Bank (2011)²

However, for the research purpose, 140 regions were aggregated into 14 regions and 57 sectors into 10 sectors. The 14 aggregated regions include: Pakistan (PAK), Bangladesh (BGD), Nepal (NPL), Sri Lanka (SRI), India (IND), Korea (KOR), China (CHN), Japan (JPN), United States (USA), European Union (EU27), Eastern Europe and Former Soviet Union (EEFSU), Rest of Annex 1 countries⁵, Energy Exporting countries (EEx), and the rest of the world (ROW). The 10 sectors include: Agriculture, Coal, Oil, Gas, Oil Products, Electricity, Energy Intensive Industry, Other Industry, Transport, and Other Services.

We have used the INDC targets submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in our simulation. Our result shows that Pakistan and Nepal both have zero carbon emission reduction targets without emission trading (Table 2). However, after emission trading, it may be plausible to propose 20 per cent and 18 per cent INDC targets for Pakistan and Nepal, respectively. This is because these countries will have to cut their

Table 2 Emission reduction and real carbon rates						
	Scenario 1			Scenario 2		
	(without	emission trading)	(with emission trading)			
Coun-	Emission	Real carbon tax rate	Emission	Real carbon tax rate		
tries	reduction	(US\$ per ton of	reduction	(US\$ per ton of		
	(%)	CO2 emissions)	(%)	CO2 emissions)		
PAK	0.0	3.1	-20.3	58.4		
BGD	-5.0	20.3	-14.0	58.9		
NPL	0.0	10.1	-17.7	58.3		
SRI	-7.0	55.3	-8.4	58.4		
IND	-35.0	14.2	-52.9	58.7		
KOR	-37.0	134.7	-22.0	59.2		
CHN	-65.0	144.8	-49.8	59.7		
JPN	-26.0	127.8	-14.1	59.2		
USA	-28.0	53.7	-30.2	59.2		
EU27	-40.0	222.8	-15.8	59.3		
EEFSU	0.00	5.5	-29.6	59.4		
RoA1	-36.0	121.7	-23.0	59.7		
EEx	-10.0	14.4	-28.2	59.6		
ROW	0.0	5.2	-22.1	59.3		

Source: Zeshan & Ko (2016)6

Table 3

Change in welfare in terms of equivalent variation (US\$ million)

Countries	Scenario 1	Scenario 2	
	(without emission trading)	(with emission trading)	
РАК	522.0	2,076.4	
BGD	-296.39	-255.3	
NPL	41.52	134.9	
SRI	356.94	358.5	
IND	381.99	15,901.0	
KOR	-1,525.5	-1,384.4	
CHN	-205,345.0	-164,948.0	
JPN	-20,063.1	-5,077.7	
USA	-36,200.0	-28,946.1	
EU27	-225,000.0	-67,996.7	
EEFSU	-65,308.8	2,738.9	
RoA1	-41931	-30,973.3	
EEx	-101,077.0	-58,654.7	
ROW	-32,348.5	9,271.9	

Source: Zeshan & Ko (2016)7

emission further down to offset the outputs of their emission trading partners. Scenario 2 also shows that emission trading converges the worldwide real carbon tax rates at given INDC targets. Table 2 further shows that emission trading could reduce carbon emissions in all five South Asian countries included in this simulation.

Emission trade: cost and benefit

This section provides the macroeconomic impact, in terms of equivalent variation as a measure of welfare, resulting from the implementation of INDC targets (Table 3). India's earning increases from US\$381 million to around US\$16 billion through emission trading, while Pakistan, Sri Lanka and Nepal earn US\$2 billion, US\$358 million and US\$135 million in welfare, respectively. The results show overall welfare loss for Bangladesh. But it is better off with emission trading than without it. Bangladesh does not earn much from emission trading, because of its higher production tax on oil products. Higher production taxes make

emission trading less favourable for the government, as it can earn more revenues from domestic taxes.

We have also analyzed the change in real GDP brought about by emission trading as an indicator of overall economic performance of a country. After emission trading, GDP growth rates decline in all the South Asian countries, except Sri Lanka where it remains stable. It might be because of Sri Lanka's higher use of renewable energy. A more diversified economy, less dependent on fossil fuels, makes it more resilient than the other countries. Table 4 shows that India faces the highest GDP loss, which is followed by Bangladesh, Pakistan and Nepal, respectively.

Hence, South Asian countries, except Bangladesh, have the potential to get higher welfare gains from the global emission trading market. However, it comes with a cost. Domestic production, imports and exports of products with higher carbon content are affected negatively, once the South Asian countries enter the emission trading market. However, in the longer run, there is always an option to use the money

Table 4 Change in real GDP (%)

	-	
Coun- tries	Scenario 1 (without emis- sion trading)	Scenario 2 (with emis- sion trading)
PAK	-0.0	-0.2
BGD	-0.2	-0.5
NPL	0.0	-0.2
SRI	-0.0	-0.0
IND	-0.1	-0.6
KOR	-1.1	-0.3
CHN	-3.0	-1.3
JPN	-0.6	-0.2
USA	-0.3	-0.4
EU27	-1.8	-0.3
EEFSU	-1.1	-0.8
RoA1	-0.7	-0.3
EEx	-0.2	-0.4
ROW	-0.0	-0.3

Source: Zeshan & Ko (2016)8

earned through emission trading in transforming the economy through a clean development strategy.

The first author is a Ph.D. candidate, while the second author is a Professor in the Division of International and Area Studies, Pukyong National University, South Korea.

Notes

- Kreft, S., David Eckstein, Lukas Dorsch, and Livia Fischer. 2015. Global Climate Risk Index 2016: Who Suffers Most From Extreme Weather Events? Weather-related Loss Events in 2014 and 1995 to 2014. German Watch.
- ² World Bank. 2011. http://databank. worldbank.org/data/
- ³ Zeshan, M., and J. Ko. 2016. "An Analysis of the Economic Impact of Implementing the INDCs of the 2015 Paris Climate Conference: A CGE Approach". *Journal of International Trade and Industry Studies*, 21(4): 81-110.
- ⁴ As countries formally join the Paris Agreement the "intended" is dropped and an INDC is converted into a Nationally Determined Contribution (NDC).
- ⁵ Annex 1 countries are the countries who are committed to reduce their CO2 emissions.
- ⁶ *ibid* Note 3.
- ⁷ *ibid* Note 3.
- ⁸ *ibid* Note 3.



The have-nots now will later be haves

Title: Global Inequality: A new approach for the age of globalization Author: Branko Milanovic Publisher: Harvard University Press ISBN: 9780674737136

Ahmad Shah Mobariz

his book is a continuation of Branko Milanovic's works on the forces driving and shaping global inequality. Using household survey data from between 1980-2008, he contests Kuznets' Hypothesis that inequality is a diminishing U-shaped function of income. He also concludes that Thomas Piketty's argument-that political forces of wars, taxation to finance the two great wars, the socialist ideology and movements and economic convergence were the main factors that pulled inequality downwards in the period 1918-1980-is not sufficient to explain inequality. Instead, he presents an alternative argument, the Inequality Wave or Inequality Cycle, which combines Kuznets' Hypothesis and Piketty's Theory that inequality follows a repetitious cyclical path. He identifies 'benign' and 'malignant' forces, which pull inequality down.

Milanovic calls the 1850–1980 period the first Kuznets' Wave in technologically advanced societies. This period first saw significant increase in income and inequality in the industrial countries, mainly Western Europe. Factors such as concentration of industrial production in a few centres, division of labour between agriculture and industrial sectors and continued stagnant wages and lowered wagerent ratio concentrated the gains to a few industrial capitalists. Inequality in this period reached its peak in the first decade of 20th century.

From the third decade of the 20th century to 1980, inequality started to diminish as income increased. In line

with the Marxian analysis, Milanovic argues that increased inequality and lowered aggregate demand for industrial output within countries triggered the two wars in Europe. Forces such as income increase, as hypothesized by Kuznets, reduced the rural-urban gap, increased schooling, led to progressive taxation and greater social security contribution after the wars. These were the major benign forces. The two wars in Europe comprised the malignant force that drove inequality down.

The 1980s marked another upswing in the inequality wave, which Milanovic calls the second Kuznets' Wave. Contrary to Kuznets' Hypothesis, after 70 years of diminishing, inequality started to increase. An important characteristic here was that the income gap among nations narrowed, but within countries it widened. Milanovic combines both inter-state and intra-state inequalities to define Global Inequality—as income inequality among the citizens of the world.

His analysis shows that global inequality increased between 1988 and 2011. Milanovic argues that a drastic change in the structure of production, technological revolution and an increased share of services in developed economies changed the labour structure and created a large wage differential, which in turn shaped a large group of middle class wage earners and some high-income groups.

The spread of globalization with the emergence of China, India and East Asia and the resultant mobility of labour and capital have further changed the growth and inequality dynamics. This second Kuznets' Wave—inequality driven by globalization—has created both winners and losers. The great winners have been the poor and middle classes in Asian countries while the great losers are the lower middle classes of the rich world. Milanovic shows that the global top one per cent, whom he calls the "Global Plutocrats", are from the rich economies, half of which are American.

Milanovic ends the book with key questions: If this wave of globalization is holding back the income growth of the rich world's middle classes, what will be the result of the next wave involving even poorer and more populous countries? And, what forces will shape global inequality in this century and the years to come?

South Asia is at the onset of an increase in output and a widening income disparity. If benign factors such as improved access to education and health, in addition to access to finance and social protection measures, are not adopted to check the inequality, the dynamics of the system might generate malignant forces to put a check on inequality. A sustained growth is attainable only if South Asians have job opportunities and, thus, substantial income for consumption. If only the upper classes benefit, growth would not be sustainable. Inequality must be put in check from the beginning.

The Reviewer is associated with Ibn-e Sina University; Porsesh Research and Studies Organization; Kabul and Ministry of Finance of Afghanistan.

Farmers' rights in South Asia's IPR regime

Farmers' right must be ensured for the conservation of agrobiodiversity and fostering innovations in agriculture.

Devendra Gauchan

Small farmers in South Asia have made unique, evolutionary and historical contributions for the conservation and development of genetic resources for food and agriculture. Crop varieties and animal breeds were selected, domesticated and nurtured by small farmers. Over generations, farmers have developed traditional knowledge, skills and practices to grow and use local varieties, or their wild relatives, to meet various household, social, economic and cultural needs. They do so by retaining seeds,

recycling them for the next planting seasons and exchanging them with their neighbours. It is estimated that 70–90 per cent of the seeds required in developing countries, including in South Asia, are met through this type of informal seed system.¹

Tradition needs defences

Such traditional practices of saving and exchanging seeds are essential for preserving the dynamics of the seed system and conserving agrobiodiversity. Such practice contributes to developing diverse varieties while ensuring the livelihood and food security of resource-poor farmers.

Preserving of farmers' rights to traditional knowledge is essential as they play a vital role in selecting, continuously improving, conserving and ensuring availability of agricultural genetic resources.²

But, in the changing context of the global economy—with the development and promotion of intellectual property rights (IPR) systems under the rubric of free trade—farmers loose



control and ownership of, and access to their own genetic resources that they have developed over millennia. Restricting this age-old traditional right of farmers to control, own and access their own seed varieties and other genetic resources jeopardizes the possibility of continuously improving farm varieties and conserving agrobiodiversity, and compromises the welfare of resource-poor farm families.

Producers of commercial varieties are protected by patents and IPRs though their 'inventions' are very much derived from the open-access traditional seeds and propagation method already in existence. Commercial breeders earn from such practices of farmers but the farmers but the latter hardly receive any reward or incentive. Moreover, the IPR restrictions imposed on commercial varieties could also limit farmers' ability to continue with those practices.

The farmers' right must be ensured also for the conservation of agrobiodiversity and fostering innovations in agriculture. This implies developing means of ensuring benefits to farmers and farming communities.

The literature currently discusses two forms of farmers' rights concepts-as a form of IPR and as a simple recognition of their past and present contributions to conserving, developing and making available crop genetic resources available.3 The first approach focuses on operationalizing farmers' rights by awarding them some form of IPRs for 'traditional' varieties. This is generally seen as a method of addressing the imbalance between farming communities and plant breeders through a 'straightforward' extension of IPRs to past innovations of farmers.

However, the existing IPR regime is not sufficient to acknowledge that the traditional knowledge is the product of inter-generational improvement within a community without an inventor. The IPR system is largely individualistic, that recognizing ownership based on the resources devoted to the new invention. Also, such practices are not eligible for a patent. Thus, protecting farmers' right over to their traditional knowledge contributing to germplasm needs a separate regime of its own.

Global farmers' rights

The issue of farmers' rights garnered attention in international agricultural circles following a series of debates that started in the Food and Agricultural Organization of the United Nations (FAO) in 1979 about unequal distribution of benefits obtained from the sharing of germplasm. This led to the adoption of three FAO Conference resolutions (4/89, 5/89, 3/91) simultaneously recognizing the rights of plant breeders as well as farmers. The concept of farmers' rights was then included in the FAO Undertaking on Plant Genetic Resources and, later, in the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGFRA), which evolved from the FAO's international undertaking in 2001.4

The ITPGRFA recognizes the rights of farmers and emphasizes the need for promoting and protecting farmers' rights at both national and international levels. Article 9 of the Treaty recognizes the enormous contribution that farmers and local communities have made to the conservation and development of plant genetic resources for food and agriculture (PGRFA) and identifies measures to protect and promote farmers' rights.⁵ It also recommends national governments to take national measures to realize farmers' rights.

Similarly, the Nagoya Protocol on Access to Genetic Resources and Benefit Sharing, under the Convention of Biological Diversity (CBD), supports

> There are two concepts of farmers' rights—as a form of IPR and as a recognition of their contributions in making crop genetic resources available.

and protects farmers' rights by seeking prior and informed consent of related communities for access to genetic resources and traditional knowledge. It makes provisions for equitable sharing of benefits accruing from the use of genetic resources and associated traditional knowledge.⁶

Taken together, these provisions call for a broad interpretation of farmers' rights, which go beyond the right to benefit-sharing. They include the right of farmers to continue the practices which contribute to the conservation and sustainable use of PGRFA and to sustain the traditional knowledge and livelihood systems needed for this.

IPRs are essential incentives for promoting technology transfers and increased investment in agricultural research and development. The Trade-Related Aspects of Intellectual Property Rights (TRIPS) under the World Trade Organization (WTO) compels member nations to provide IPR protection to new plant varieties either through patent or a *sui generis* system or both for promoting investment and innovations. TRIPS *sui generis* provision has been used by interested countries to recognize farmers' rights.

The International Convention for the Protection of New Varieties of Plants (UPOV Convention) has provided one of the most accepted sui generis systems for plant variety protection, vis-à-vis recognition of the plant breeder's right. It recognizes farmers' interests as an optional exception to the plant breeder's right.7 For instance, the third amendment of UPOV Act, in 1991, made the farmers' privilege optional to the member countries8, indicating that national legislation formulated according to this provision may not provide for the rights of farmers to save, use and exchange part of the protected seeds with other farmers locally.

However, IPRs that promote commercialization of agriculture may hinder the rights of farmers to the genetic resources and traditional knowledge that they have been controlling over many generations. Therefore, in order to foster both innovation and conservation, some countries have developed *sui generis* legislation under the WTO's TRIPS, with provisions for farmers' rights in plant variety protection laws. Countries that are party to the CBD, the ITPGRFA and the Nagoya Protocol are obliged to draft laws that include provisions of both plant breeders' and farmers' rights. The table below provides the membership status of South Asian countries in the WTO, the ITPGRFA and the Nagoya Protocol.

Except Sri Lanka, all South Asian countries are party to the ITPGRFA, while only Bhutan, India and Pakistan have ratified the Nagoya Protocol of the CBD. All are party to CBD and most of them are the WTO members, except Bhutan, which has a status of an observer member. However, none of the South Asian countries are UPOV members.

India is the first South Asian country to formulate and enact plant breeders' and farmers' rights in a balanced manner. India formulated Plant Variety Protection (PVP) and Farmers' Rights (FR) Act (2001) as a *sui generis* law to meet TRIPS requirements. The Act, which aims to balance breeders' rights with farmers' rights, includes a total of ten individual farmer rights and one community right.⁹ The act is functioning and actively issuing plant variety certificates (PVCs), including granting IPRs to farmer-breeders. But despite its formulation in 2001 and the announcement of its implementation in 2005, it is yet to come into full force. Although there is an increasing evidence of registration of farmers' varieties (FVs) with the enactment of the law, there are no evidences of inclusion of these FVs in the official seed supply chain and commercialization process.¹⁰ Similarly, cases of benefit-sharing from the FVs are not given due importance in spite of the fact that several such varieties may have been used to develop commercially marketable varieties.

South Asian farmers' rights

South Asian countries have the obligation to develop plant variety protection laws that meet international commitments. Sri Lanka has drafted a plant breeder's rights legislation, known as Protection of New Plant Varieties (Breeders' Rights) 2001(draft), which follows the UPOV model of 1991. This legislation does not recognize farmers' rights.11 The PVP laws are still not officially approved and enacted in other South Asian countries, e.g. Bangladesh, Bhutan, Pakistan and Nepal. As a result, provisions and issues regarding farmers' rights and IPR sare either absent or partly dealt with through existing Biodiversity Acts or seed laws.

Bhutan has approved its Biodiversity Act (2003) with provisions for breeders and farmers' rights.¹² Nepal, as a member of the WTO, is commit-

Table

South Asian countries' membership of international agreements					
Countries	ITPGRFA	CBD	Nagoya Protocol	WTO	
Afghanistan	Yes	Yes	No	Yes	
Bangladesh	Yes	Yes	No	Yes	
Bhutan	Yes	Yes	Yes	Observer	
India	Yes	Yes	Yes	Yes	
Maldives	Yes	Yes	No	Yes	
Nepal	Yes	Yes	No	Yes	
Pakistan	Yes	Yes	Yes	Yes	
Sri Lanka	No	Yes	No	Yes	

Source: Author's compilation

ted to implement a *sui generis* system to protect plant varieties. Nepal has yet to approve and implement the draft Plant Variety Protection (PVP) and Farmer's Rights Bill (2005).¹³ The draft bill also has provisions to balance farmers' and breeders' rights. At the moment, seed development, certification, registration and release are being administered through the Seed Act (1988)—amended in 2008—and the Seed Regulation (2013). These Seed Act and Regulations deal with various aspects of IPRs such as seed ownership, marketing and distribution.

Many countries of South Asia have in place IPR laws which were formulated long ago. They have yet to form a comprehensive IPR policy as that of India. India has already made a significant policy shift towards a pro-intellectual property (IP) position in the seed sector. The recently approved National Intellectual Property Rights Policy (2016) of India envisages national development by promoting creativity, innovation and entrepreneurship.¹⁴ It aims to integrate IP as a policy and a strategic tool of national development plans.

Farmers' rights are an important part of the new IPR policy of India. It recognizes the rich traditional knowledge of farmers and their role in conservation. Considering the low awareness of farmers about their rights over genetic resources and traditional knowledge, the new IPR policy focuses on promotional tools and incentive mechanisms to encourage the farmers to register varieties and file for IPRs. However, the focus of the Indian IPR law is more on commercialization of traditional genetic resources and knowledge. Since, genetic resources are a shared intellectual heritage of local communities, the focus on commercialization without adequate conservation focus would hinder the collective efforts of communities to promote their in situ conservation and sustainable use.

Nepal recently drafted a national Intellectual Property Rights Policy. The policy recognizes IPRs as an important mechanism for national development and prosperity. One of the components of the policy focuses on IPRs on new plant varieties and agricultural genetic resources.15 However, farmer's right is not an important component of the draft policy, even though it recognizes traditional knowledge and collective community contribution to varieties. The proposed IPR Policy focuses on patents and plant breeders' rights without provisions for strong farmers' rights, which may erode the use of diverse plant genetic resources by discouraging traditional farming activities that promote community exchange and use of genetic resources.

Farmers' rights play an important role in the conservation and sustainable use of agrobiodiversity and fostering innovations in agriculture. Some countries of South Asia incorporate both plant breeders' and farmers' rights in their sui generis mechanism to protect IPRs in agriculture. However, many countries in South Asia lack officially approved legislation on farmers' rights even though they do have the related provisions in policies and some form of draft laws. Limited human resource capacity, low political commitment and lack of awareness among planners, policy makers and stakeholders are major obstacles and challenges to the formulation and implementation of farmers' rights and appropriate sui generis legislation in South Asia.

Sui generis legislation, which has provisions for both plant breeders' and farmers' rights, similar to that of India, may be suitable for many agrarian countries of South Asia. A legal framework is essential to provide incentives for investment in plant breeding and seed industry development, not to mention promotional activities, to ensure the rights of farmers over their genetic resources and traditional knowledge. A suitable national level institutional mechanism is needed to cope with the changing context while protecting farmers' rights. Their access to agriculture needs facilitating, benefits from it need sharing and innovations in the sector need fostering.

IPR regime should not discourage local sharing of genetic resources and traditional knowledge in biodiversity conservation.

Farmer-friendly IPR

Considering the low level of awareness among farmers on their rights to genetic resources, the new IPR policies that are coming up in South Asia may not witness significant support to farmers' rights and agrobiodiversity conservation. The situation can be improved with a strong emphasis on promotional tools and incentive mechanisms that encourage farmers to register varieties and file for IPRs. Furthermore, IPR laws that focus on commercialization of traditional genetic resources and knowledge will hinder collective efforts of the communities in safeguarding their genetic resources. And, this could stymie future innovation in agriculture. Therefore, care is to be taken while enforcing farmers' rights. The IPR regime should not discourage local sharing of genetic resources and traditional knowledge in biodiversity conservation. Disruption of the local seed system could disrupt the livelihoods of small rural farmers.

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E-commerce, developing countries and WTO

Some estimates suggest that business to consumer e-commerce sales will double between 2013 and 2018 with Asian and Oceanic markets expected to grow the fastest.

Shaleen Khanal

he internet and e-commerce¹ activ-L ities are transforming the nature of global business and trade on a massive scale affecting today's domestic and multilateral rules of international trade and finance. Determining the scope of current multilateral trade regulations-including General Agreement on Tariffs and Trade (GATT), General Agreement on Trade in Services (GATS) and the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)—amid the complexities of trade forms invited by e-commerce becomes crucial. This is also important to govern the sector in the future.

Engine of growth

Members of the World Trade Organization (WTO) had developed a work programme (WP) during the Geneva Ministerial Conference of 1998 to discuss the trade related aspects of e-commerce. The WP was initiated with a moratorium on electronic transmission customs duties by members. They had agreed not to impose duties on such transmissions. Unfortunately, for reasons that shall be discussed, progress on the WP and discussions on the e-commerce agenda has stalled for a long time. Now, there are signs that the WP may be gathering momentum. This necessitates immediate attention from developing and least-developed countries (LDCs). They need to comprehensively analyse the implications of any potential legal framework on e-commerce to address

future challenges and opportunities.

E-commerce holds the potential to be a major engine of growth in global trade and development. Information and Communication Technology's (ICT) involvement in global value chains is ever expanding, access to global connectivity through internet and telephony is improving and costs of communication and transportation are falling. Businesses and consumers are embracing e-commerce globally. As a result, the sector is expanding rapidly.

Some estimates suggest that B2C (business to consumer) e-commerce sales will double between 2013 and 2018 with Asian and Oceanic markets expected to grow the fastest. Anecdotal evidences from the United States, Canada, and South Korea suggest that B2B (business to business) e-commerce sales are rising rapidly. This rapidly expanding market provides immense opportunities for developing and least-developed countries (DLDCs).2 Adoption of modern forms of e-commerce can potentially enable small and medium scale enterprises (SMEs) expand their markets at competitive prices by removing intermediaries and minimizing market costs. E-commerce can also assist in establishing and consolidating international reputation of small firms and reduce market research costs.3 Ease of integration into global value chains can lead to increased competition and, therefore, adoption of more efficient production mechanisms while simultaneously

allowing access to cheaper raw materials.

DLDCs have made substantial progress in recent years in improving digital and mobile connectivity among their citizens, but the digital divide between developed nations and the DLDCs is also growing. Indicators like mobile telephone usage, broadband connectivity and speed and internet usage all point to a rising disparity in favour of developed countries vis-àvis the DLDCs. Electricity availability remains another important challenge. Production per capita of electricity in developed countries can be up to 40 times that of LDCs. As a result, many developing and developed nations face major electricity shortages. This raises the cost of energy and increases incidences of blackouts.

Inadequate legal and security infrastructure pose further challenges. Developing nations, especially the LDCs, are woefully under-prepared in this regard. For instance, at present, only 42 per cent of LDCs have e-transaction legislation and only 40 per cent have cybercrime laws in place. Even with legislation the ability of these countries to successfully implement them is doubtful. Further, to attract foreign investments in the sector, considerable effort is needed to ensure protection of intellectual property rights (IPRs). Therefore, significant investment and effort are required to bridge the infrastructure and legal gaps between the rich nations and the poor.

Macro level challenges are further compounded by local level problems for SMEs. First, of course, are the growing pains associated with adoption of a new mode of production, where firms associated with old methods are bound to lose out. Additionally, the cost of access to modern technology and lack of access to international e-payment systems effectively rule out the participation of most SMEs. There are further problems associated with cross-border trade. Traders frequently report multiple problems associated with lack of harmonization in trade and e-commerce laws among countries, burdensome customs procedures, weak IPR protection and inadequate legal and security frameworks concerning e-commerce. Therefore, firms in DLDCs are not yet in a favourable position to take advantage of trade opportunities arising out of liberal e-commerce regulations.

This has resulted in the ineffectiveness of WTO's e-commerce work programme. During WP's inception, the definition and scope of e-commerce were not fully developed and understood by the member parties and DLDCs' exposure to e-commerce was fairly low. This led developing countries and LDCs to demand consideration of all possible implications arising out of an agreement on e-commerce. The WP was introduced with that consideration. Specifically, their concerns included-which perhaps still persists—lack of clarity surrounding most discussions on e-commerce issues in the multilateral arena; implications of e-commerce for the traditional role of governments, especially in their balance of payments and finances; and an increasing pressure to liberalize e-commerce by lifting tariffs and taxes.4 The demand for WP received further support from the European Union (EU). The organisation wanted to investigate the potential effects of WTO regulations on issues related to consumer protection and cybersecurity.

Notwithstanding the issues related to the definition and scope of e-commerce in the WTO context, along with its fiscal and regulatory implications in terms of cross-border supplies, considerable divide has persisted. This difference is particularly obvious in development related demands of DLDCs and developed nations on the WP. While developed nations want a removal of trade barriers and protection of data, source codes and intellectual property rights, DLDC's demands have focused on bridging the digital divide, empowering SMEs to use e-commerce, lowering their cost of trade and securing online modes of payments, among others. As a result, since its early days, discussions on the work programme have often descended into fruitless debates with hardly any progress made.

Progress got hampered further after the launch of the Doha Development Agenda (DDA) in 2005. Countries have tried to influence the e-commerce outcomes to suit their national interest vis-à-vis other resolutions in the DDA. Nowhere has this been more apparent than in the TRIPS case of non-violation situation complaints (NVC) moratorium. Time and again, DLCDs have been demanding the NVC moratorium in exchange for the e-commerce moratorium on zero duties on electronically traded items. Most recently, the Africa Group with support from other developing countries blocked initiatives under the e-commerce agenda calling for WTO to prioritize other work on DDA instead.

However, considering the ever-expanding scope of e-commerce to issues far beyond the coverage of the existing e-commerce moratorium, and the rising popularity of bilateral and plurilateral agreements on trade and e-commerce, the bargaining leverage for DLDCs against the NVC morato-

> LDCs must come up with a united voice on their positions before any regulatory framework is devised.

rium is expected to diminish substantially, unless the scope of e-commerce moratorium is expanded. This is precisely what the LDC Group has demanded after the Nairobi Ministerial Conference of 2015. Additionally, post-Nairobi, the WP has been given a fresh impetus with various members pushing to achieve some form of outcome in the e-commerce domain by the upcoming 11th WTO Ministerial Conference in December 2017. This is evidenced by decision taken by Cambodia-the new chair of the LDC coordinator at the WTO-to prioritize resolving the issue of e-commerce under its leadership. The latest informal ministerial in Davos has also identified e-commerce as a priority item for further discussion.

In this regard, the DLDCs must recognize that they require a complete and comprehensive understanding of the impact of e-commerce on their economies. They must outline the challenges and opportunities presented by e-commerce before moving forward. It also becomes imperative for the LDCs to come up with a united voice on their positions and requirements on various issues pertaining to e-commerce before any regulatory framework is devised. They should consider investments in infrastructure, strengthening legal and policy framework, access to affordable and latest technology and international payment gateways and data protection and security, among others.

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Notes

- ¹ E-commerce covers purchases and sales of goods and services conducted over computer networks in domestic and international markets.
- ² UNCTAD. 2015. *Information Economy Report 2015*. UNCTAD, Switzerland.
- ³ ITC. 2016. *Bringing SMEs onto the E-commerce Highway*. Geneva: International Trade Centre.
- ⁴ Singh, A.D. 1999. "Electronic Commerce: Issues for the South". *Trade-Related Agenda, Development and Equity Working Papers.* World Resource Institute.

NTMs facing Nepal's vegetable exports discussed

THE potential of Nepali vegetable exports were discussed at a seminar in Kathmandu on 20 December 2016.

Senior Consultant of South Asia Watch on Trade, Economics and Environment (SAWTEE) and Former Commerce Secretary, Mr. Purushottam Ojha presented the findings of the study and pointed out the problems faced by Nepali traders at border crossings for not being able to meet sanitary and phytosanitary (SPS) standards set by India.

Non-tariff measures have been discouraging trade through customs points that has resulted in a high incidence of informal trade, he said citing the research. Mr. Ojha also insisted on the importance of having proper measures related to pest risk analysis (PRA) to make Nepali vegetables exportable not only to India but also to third countries. Similarly, Ms. Neelu Thapa, SAWTEE Programme Coordinator, said that Nepali vegetables, especially off-season vegetables such as bitter gourd, pointed gourd, sponge gourd, mustard leaf etc. are preferred by Indian consumers for their quality and could be sold at a premium price in the Indian market.

On exports to Bangladesh, she said that a high tariff rate of 25 per cent is a discouraging factor. She also pointed towards the potential market in the Middle East, provided that Nepali suppliers meet their strict sanitary and technical standards.

The study suggests measures to develop a concerted action agenda to address the problems related with vegetable exports and establishing effective market linkages. The need for capacity building of Nepali farmers and traders on post-harvest operations and trainings to enable them market their produce was also discussed during the programme.

Various organizations, research institutions, agriculture experts, activists and development partners participated in the event. They suggested establishing a horticulture promotion board, creating vegetable export zones, implementing Good Agriculture Practices etc., for the promotion of Nepali vegetable exports.

SAWTEE organized this national workshop titled "Export potential of fresh vegetables to India and other countries" to validate its research carried out with support from Samarth-Nepal Market Development Project.

The research was carried out at major customs points in Bhairahawa, Birgunj, Biratnagar, Jhapa, Dhangadi, Mahendranagar and Nepalgunj. ■

Navigational usage of inland waterways in BBIN

CONSUMER Unity & Trust Society (CUTS) International launched an initiative that aims to promote navigational usage of inland waterways in the Bangladesh, Bhutan, India, Nepal (BBIN) region. In this event held on 24 October 2016, stakeholders discussed the gender and livelihood aspects of institutions governing inland waterways in the Ganga and Brahmaputra Rivers. The event brought together experts, practitioners and government officials in Guwahati, India. The initiative is funded by The Asia Foundation.

9th South Asia Economic Summit held in Bangladesh

THE Ninth South Asia Economic Summit (SAES IX) was organised and hosted by the Centre for Policy Dialogue (CPD) from 15 to 16 October in Dhaka. The theme of SAES IX was "Reimagining South Asia in 2030".

South Asia Watch on Trade, Economics and Environment (SAWTEE) was one of the co-organisers of the event along with Institute for Policy Studies (IPS), Colombo, Research and Information System for Developing Countries (RIS), New Delhi and Sustainable Development Policy Institute (SDPI), Islamabad.

Deliberations at the summit focused on envisioning a South Asia, which, by 2030, will be an upper middle income region with a high GDP



growth rate, a strong middle class, zero hard-core poverty and hunger, sustainable cities and structurally transformed economies with a strong manufacturing sector.

A common thread throughout the discussions was that South Asia is the least economically integrated region in the world and that there was a lot the region could achieve with regional cooperation on various socio-economic issues that are important to the countries in the region.

SAARC agriculture intensification discussed in Dhaka

SOUTH Asia Watch on Trade Economics and Environment (SAWTEE) organized a discussion on sustainable intensification of agriculture in South Asia in Dhaka on 27 December 2016.

The reference group meeting titled "Sustainable intensification of agriculture in SAARC Region" was supported by the International Fund for Agricultural Development (IFAD) and held in cooperation with the SAARC Secretariat and SAARC Agriculture Centre (SAC).

The findings of a scoping study carried out by SAWTEE were disseminated to key experts from South Asian Association for Regional Cooperation (SAARC) member countries for in-depth discussions regarding the preparation of an Action Plan for sustainable intensification of agriculture in the region.

The key presentation on the scoping study by Dr. Hari Dahal, Senior



Consultant at SAWTEE, focussed on the need for sustainable intensification practices in agriculture in South Asia region in the face of an increasing population and pressing environmental degradation.

The meeting also identified water and soil as the two key thematic areas to focus for the implementation of sustainable intensification of agriculture. Experts from SAARC member countries made country specific suggestions during the meeting.

About 25 participants representing inter-governmental organizations, government and non-governmental organizations, development partners, research and academia from Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka attended the event.

Data visualization workshop held

SUSTAINABLE Development Policy Institute (SDPI), Islamabad and the Social Policy and Development Centre (SPDC), Karachi organised a data visualization workshop in Bangkok, Thailand from 13 to 15 December 2016.

The workshop discussed contextual changes and their impact on think tanks, their research quality, policy influence and resource mobilization. The main objective of the discussions was to highlight the impact that changes at national, regional and global levels have had on policy research, engagement and capacity building.

The workshop held on the first day of the meeting emphasized the need to utilize appropriate tools and technology for handling big data sets. The participants shared their experiences on how visual representation of data helps in communicating research results to the general audience in an efficient and effective manner.

The meeting also agreed that a combined data portal of Sustainable Development Goals (SDGs) will be developed for the participating think tanks.

The event was held as part of the International Development Research Centre (IDRC), Canada's Think Tank Initiative (TTI). Fourteen South Asian think tanks from Bangladesh, India, Nepal, Pakistan and Sri Lanka discussed cross learning and possible collaborative ventures.

Participants also included policymakers and representatives of the development partners.

Ninth CGE modelling training

THE 'Ninth South Asian Training Programme on Computable General Equilibrium (CGE) Modelling' was held in Cox's Bazar, Bangladesh from 12-16 November 2016.

Participants were trained on the use of CGE modelling as a tool for policy analysis and research.

South Asia Watch on Trade, Economics and Environment (SAWTEE) and South Asian Network on Economic Modeling (SANEM), Dhaka and the Centre for WTO Studies (CWS), New Delhi organized the training.



Export Potential of Fresh Vegetables to India and Other Countries

Vegetalis production is increasing every year as there are high returns to investment compared to other careads and crops.

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Policy Brief: Export Potential of Fresh Vegetables to India and Other Countries Author: Neelu Thapa Publisher: SAWTEE



South Asia Watch on Trade, Economics and Environment (SAWTEE) is a regional network that operates through its secretariat in Kathmandu and member institutions from five South Asian countries, namely Bangladesh, India, Nepal, Pakistan and Sri Lanka. The overall objective of SAWTEE is to build the capacity of concerned stakeholders in South Asia in the context of liberalization and globalization.

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