

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.

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With 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.

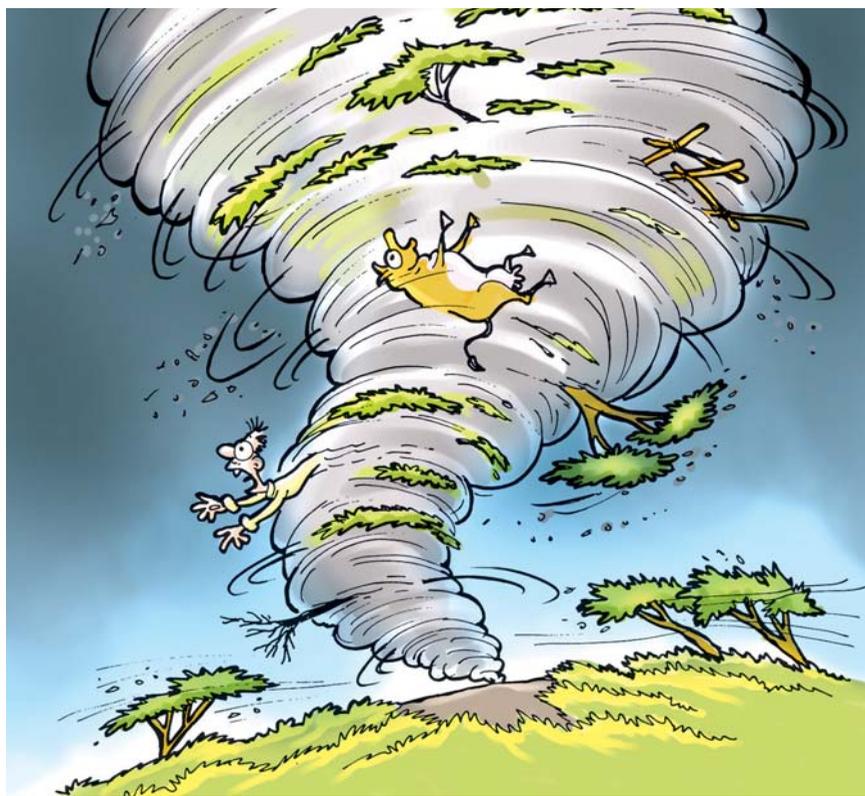
Many of the impacts in the South Asian Association for Regional Cooperation (SAARC) region are trans-boundary in nature. Glacial melts impact downstream water availability not just in Bhutan, India, Nepal and Pakistan, but also in Bangladesh. Reduced cereal yields will not just affect food producing 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 rain-fed 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 sorghum—by the 2050s, but no mean change for rice yields.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.

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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 adap-

tation 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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Notes

- 1 We have taken the eight member countries of SAARC—Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka—as comprising South Asia.
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