Rapidly growing middle class presents severe challenge for the environment and human health in Asia and the Pacific

Unprecedented economic growth, which has lifted millions out of poverty in Asia and the Pacific, is putting heavy pressure on ecosystems. Increasing unsustainable consumption patterns have led to worsening air pollution, water scarcity and waste generation and threaten human and environmental health. Increased demand for fossil fuels and natural resources - extensive agriculture, palm oil and rubber plantations, aquaculture and the illegal trade in wildlife – are causing environmental degradation and biodiversity loss. Countries are taking action towards a green growth path but, despite increased investments for example in renewable energy, the exploding demand risks undoing development gains. The situation is exacerbated by adverse climate change effects and an increasing number of natural disasters, which are causing devastating human and financial losses in the region. Extreme climate events are projected to become the new normal. The GEO-6 report looks at the state of play in key areas, highlights drivers of environmental impacts and looks at ways to address them.

Overall drivers

- Population size and growth: Asia and the Pacific's huge population poses significant environmental challenges. The region's population, about 60 per cent of the world's total, reached around 4 billion people in 2012 and is projected to rise to 5.08 billion by 2050.

- Rapid economic growth and intensified industrialization has led to a sharp increase in natural resource use, which is both unsustainable and inefficient, and results in pollution, declining biodiversity and natural resource depletion.

- The region is experiencing the world's fastest urbanization rate, accounting for 48 per cent of global urban population in 2014. This is projected to increase to 63 per cent by 2050.

- Lifestyle changes: The main driver for accelerating domestic material consumption is the expanding middle class (from 21 per cent in 1990 to 56 per cent in 2008). The size of the global middle class is projected to increase from 1.8 billion (2009) to 4.9 billion in 2030 with most of the growth coming from Asia. OECD predicts that the middle class's global spending will grow to US$ 56 trillion by 2030 from US$ 21 trillion today; more than 80 per cent of this increase in demand is expected to come from Asia and the Pacific.

- Food production is projected to continue to rise. Changing dietary patterns, mostly from cereals to meat, have led to an increase in meat production by 50 per cent between 2000 and 2013. While the region houses 60 per cent of the world's population it accounts for only 30 per cent of its land.

- Rapidly increasing demand for natural resources: The production of biofuels, a major energy source in the region (15 per cent of total primary energy supply), increases the demand for arable land, thus leading to deforestation. Oil palm plantations have expanded significantly: Indonesia 3.7 times the area in 2014 (compared to 20000, Malaysia 1.5 times and Philippines 3.4 times).

Increased environment-related health risks

- There is increasing recognition that global health is endangered by climate change. Concerns relate to changes in the range of vector-borne diseases and heat stress but also effects on food production, natural disasters, conflict and migration.

- Widespread contamination of ground water by human and industrial waste, including pharmaceutical and personal care products, runoff of agrochemicals, nanomaterials, and organochlorides is a major concern across the region. About 30 per cent of the population depends on drinking water contaminated by human feces.

- Air pollution, resulting in heart and chronic illnesses, cancer, increased morbidity, and premature deaths, has two major sources: in households from the burning of coal and biomass for cooking and heating, and in the ambient environment from fossil fuel combustion, mostly for transport and electricity generation.

- There has been some reduction in emissions of Sulphur dioxide and Nitrogen oxides, but air pollution and GHG emissions are high and continue to increase. Short-lived climate pollutants (SLPCs) contribute to 102 deaths per 100,000 people in Western Pacific and 51 in Southeast Asia.

- Almost 1.9 billion people still use biomass for cooking, producing high amounts of air pollution. More than 1 million premature deaths annually in India and China can be attributed to exposure to household air pollution.

- Energy provision continues to rely on fossil fuels, mostly coal (China and India) and the share of renewable energy remains small despite very significant investment in renewable energy infrastructure. Currently only Indonesia produces more than 5 per cent (7.6 per cent/geothermal) of its energy from renewable sources.

- Asia is the largest user of asbestos in the world, accounting for two-third of global consumption, despite the well-known detrimental effects on the respiratory system. In 2011 China produced almost 20 per cent of all global asbestos.

- Uncontrolled dumping, a major source of disease, is still the main waste disposal method. For example, in Mumbai about 12 per cent of total municipal solid waste is burned either openly on the streets or in landfills releasing black carbon, dioxins and carcinogenic furans.

- Transboundary smoke and haze is a leading regional air quality issue. Uncontrolled biomass and peat burning, deliberately set to clear forests for agriculture in large parts of Kalimantan, Sumatra, caused haze that extends to Brunei, Malaysia and Singapore and has severe regional health impacts. The region’s economic cost during the 2015 wildfires is estimated to exceed US$16 billion.

Specific Drivers

- Domestic combustion of biomass, industrial processes and electricity generation.

- Increasing vehicle exhaust emissions and low and poorly regulated fuel standards.

- Increasing air traffic due to budget airlines and a growing middle class.

Impacts

- Climate change, together with other aspects of environmental change, is making diseases such as malaria, dengue, chikungunya and Zika harder to manage. Flooding increases the risk of leptospirosis.

- Chronic exposure to air pollution is an important risk factor for cardiovascular diseases. WHO found that 88 per cent of premature deaths in the region are disproportionally due to the burden of outdoor air pollution.

High and increasing vulnerability to climate change and natural disasters

Across the region the intensity and frequency of extreme events such as heat waves, tropical cyclones, prolonged drought, intense rainfall and severe dust storms has increased significantly.

- Asia Pacific continues to be the world's most disaster prone region. Approximately 41 per cent of all natural disasters reported over the last two decades occurred in the region. The number of record-breaking rainfall events increased in the region by 56 per cent over the 1981 – 2010 period. The region accounted for 91 per cent of the world's deaths due to natural disasters in the last century.

- Effect of climate change will continue to impose economic losses that could offset development gains, increase poverty and inequality, and threaten water and food security. Between 2005 and 2014 natural disasters affected 1.4 billion people in the region.

- In the absence of adaptation, hundreds of millions of people are projected to be affected by coastal flooding and will be displaced due to land loss. More typhoons and hurricanes reach above 40° north; in the summer 2015 three major typhoons hit northern China, Japan and Korea.

Drivers

- The IPCC places medium confidence on the attribution to climate change of increases in the frequency or intensity of ecosystem disturbances, such as droughts and storms.

Impacts

- ESCAP estimates that the average number of people exposed to annual floods increased from 30 million to 64 million and the population living in areas affected by cyclones from 72 million to 121 million between 1970 and 2010. During 2010-2011 more than 42 million people were displaced in the region as a result of extreme weather events.

- Economic damage caused by disasters increased from US$52 billion in the 1970s to more than US$523 billion in 2005 – 2014. Reported economic damage incurred in 2015 was more than US$ 45.1 billion.

- In 2011, six of the ten countries most vulnerable to climate change were in Asia and the Pacific. By the 2070s the top Asian cities in terms of population exposure to coastal flooding will be Bangkok, Dhaka, Guangzhou, Kolkata, Mumbai and Shanghai among others.

Loss of ecosystem integrity and biodiversity

- The region has seen a staggering growth in the demand for wood and forest products. Natural forest areas in Southeast Asia, recognized as global biodiversity hotspots, are being deforested annually by more than 1 million hectares on average, resulting in hundreds of millions of tonnes of carbon dioxide

emissions per year between 2005 and 2015. Forest cover in northern Thailand, for example, is projected to decline from 57 per cent in 2002 to 45 per cent in 2050.

- The region contains the world's largest number of threatened species. In 2015 40,171 plants and 5,250 vertebrates were categorized as threatened. The number of threatened mammal and plant species increased by more than 10 and 18 per cent respectively in the last decade.

- More than 80 per cent of the region's coral reefs are at risk, with 56 per cent at high risk, mainly due to thermal stress and dumping of plastic debris and micro-plastic waste. The annual economic damage of ocean acidification-induced coral reef loss by 2100 is estimated at US$870 billion, representing a large GDP loss for small islands and coastal economies.

- Wetlands constitute an important part of land ecosystems. Southeast Asia has 56 per cent of the world's tropical peatland and 42 per cent of its mangroves. 60 per cent of the original extent of mangroves has been cleared for coastal development.

- The cumulative effects of climate change and human actions (overfishing, poor agricultural land use, inappropriate coastal development) are threatening the long-term sustainability of coastal and marine ecosystems. Oceanic mega-fauna populations are unlikely to be able to support the massively increased fishing pressure to which they are subjected: more than 5,645 commercial vessels alone were actively fishing in the Pacific Ocean in 2011.

Specific drivers

- To meet the growing demand in wood products Asia's industrial roundwood production has risen by 137 per cent since 2006. In 2010 13 million hectares of tropical forest were cut down; mostly to make space for palm oil and beef production.

- The estimated value of the illegal trade in wildlife and wood products in Asia and the Pacific is US$2.5 billion and US$17 billion respectively. The demand for rosewood has risen dramatically and Siamese rosewood is now included on the CITES list Appendix II. The estimated rate for illegal, unreported and unregulated fishing in the Western Central Pacific Ocean is 34 per cent of the total catch.

Impacts

- Destruction and degradation of these ecosystems can lead to loss of livelihoods and migration.

- Social wellbeing, prosperity and health of coastal dwellers depend on products and services provided by marine ecosystems. Fish, for example, serves as a primary source of animal protein and a major supplier of micronutrients.

- Non-wood forest products generate income for millions of people; they constitute, for example, 49 per cent of household income in India and 45 per cent in upland Lao PDR.

Water scarcity and deteriorating water quality

- Water scarcity and deteriorating water quality is commonplace throughout the region, which has less than 30 per cent of the world's internal renewable freshwater resources. As climate change impacts on water resources become more pronounced, particularly in rivers originating in the Himalayas, flood and drought events will become more frequent and intensified.

- The region accounts for more than 50 per cent of the world's water use, and although water intensity has decreased sharply, it is still more than double the world average.

- Several river basins – the Ganges, Haihe, Indus and Yellow river – have high organic pollution. The sources are untreated or partially treated sewage, industrial wastewater, landfill leachate and agricultural runoff. In 2015 sanitation coverage was below 50 per cent in South Asia, Southeast Asia and Pacific. Only 30 per cent of the wastewater generated in urban India is treated.

- An emerging class of contaminants is pharmaceutically active compounds from the widespread use of pharmaceuticals and personal care products. Direct discharge of untreated sewage has led to high concentrations of pharmaceuticals in various Indian rivers.

Specific drivers

- Agriculture's water requirements, given the large population, accounts for 90 per cent and above of withdrawal in several countries in the region. The largest areas under groundwater irrigation are in India, with 39 million hectares.

- Industry's share for water use is specifically high in China (23.2. per cent).

Impacts

- Poor water quality, low availability and poor sanitation cause waterborne diseases such as diarrhea and cholera, which contribute to 1.8 million deaths annually and 24.8 million life years lost in the region.

Waste generation increase and underperforming waste management

The Asia Pacific region is facing a serious waste management problem that threatens human health and causes environmental degradation and greenhouse gas emissions.

While waste generation is increasing at an alarming rate, waste management is underdeveloped, including poor waste separation, low collection rates, unsafe informal recycling practices and uncontrolled disposal. Uncontrolled dumping and open burning is still the main waste disposal method in the region, leading to leachate run off, methane emission and spontaneous combustion.

- Municipal solid waste generation is expected to rise from 870 million tonnes in 2014 (43 per cent of world's total) to 1.4 billion tonnes annually by 2030 in the region. New and complex waste streams like e-waste, food waste, construction/demolition waste, disaster waste and marine litter have emerged.

- China (6 million tonnes), Japan (2.2 million tonnes) and India (1.7 million tonnes) are among the top five generators of e-waste.

Impacts

- Poor waste management threatens both human and environmental health.

- Uncontrolled landfill sites contribute to increasing greenhouse gas emissions; GHG emissions from waste in Asia Pacific rose from 370 million tones in 1990 to 500 million tones in 2010, around 33 per cent of global emissions from the waste sector.

Overall recommendations for Asia and the Pacific

- More sustainable production and consumption patterns (SDG 12), increased resource efficiency and a decoupling of economic growth from resource consumption are needed.

- Low-emission development pathways contribute significant national co-benefits, such as improved energy security and resilience to energy price shocks, improved health due to lower local pollutant emissions, and increased agricultural and land-use productivity.

- Building stronger institutions and governance are especially important, including mainstreaming the environment in other policy areas, to close the widening gap between policy formulation and its implementation.

- The region's shift towards green energy is currently held back due to issues with financing, inadequate energy market regulatory reforms, continuing fossil fuel subsidies and weak or absent carbon process.

- However, innovation in cost-efficient renewable energy technologies is increasing in the region. Asia accounted for 60 per cent of global progress on energy access and clean energy objectives during 2010-2012, well above its share of global energy consumption.

- The electricity production output from renewable municipal waste in the region has increased nearly 5 times, from 988 GWh in 1990 to 4952 GWh in 2013.

- Strengthening national and international commitments provides another way forward. The ASEAN Agreement on Transboundary Haze Pollution for example is an agreement, signed by all ASEAN countries, for cooperative action to control smoke haze caused by wildfires.

- China passed the Circular Economy Promotion Law to reduce energy intensity and industrial water consumption per unit of production as well as increased industrial solid waste recycling rate.

- The Republic of Korea passed the Framework Act on Low Carbon Green Growth to reduce energy intensity and increased investments in green technology.