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# Scoring the Sustainable Development Goals: Pathways for Asia and the Pacific

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## **Abstract**

*Despite considerable hope and enthusiasm raised by the Sustainable Development Goals (SDGs), and some quick initial efforts, many governments and stakeholders are uncertain about how to proceed concretely. The 2030 development agenda is intended to be transformative, and the goals seem comprehensive, but they also are very complex - with 17 goals, 169 targets, and 231 indicators. As the attention shifts from the overall vision of the SDGs to the details of the targets and indicators, there is some risk that an intensive focus on data and measurement may shift attention away from the big picture and concrete transformative actions. It is important to ensure that scoring the sustainable development goals is not just about record keeping or only chasing small wins; it is essential to have broad strategies that are ambitious enough to score the winning goals. Such broad strategies will need transformative policies and institutional reform if the potential of the SDGs is to be realized. Cherry-picking a few SDGs, which are already part of national strategies, and maintaining the silo approach and institutional "turf" battles will not achieve the vision of the 2030 Agenda. This report aims to highlight the importance of keeping the focus on the big picture of how to achieve the transformative potential of SDGs. In order to do so, the report argues that more ambitious and strategic policies and comprehensive institutional reform are needed at the national level.*



# 1. INTRODUCTION: GOALS FOR A SUSTAINABLE ASIA-PACIFIC

Despite considerable hope and enthusiasm raised by the Sustainable Development Goals (SDGs), and some quick initial efforts, many governments and stakeholders are uncertain about how to proceed concretely. The 2030 development agenda is intended to be transformative, and the goals seem comprehensive, but they also are very complex - with 17 goals, 169 targets, and 231 indicators. As the attention shifts from the overall vision of the SDGs to the details of the targets and indicators, there is some risk that an intensive focus on data and measurement may shift attention away from the big picture and concrete transformative actions. It is important to ensure that scoring the sustainable development goals is not just about record keeping or only chasing small wins; it is essential to have broad strategies that are ambitious enough to score the winning goals. Such broad strategies will need transformative policies and institutional reform if the potential of the SDGs is to be realized. Cherry-picking a few SDGs, which are already part of national strategies, and maintaining the silo approach and institutional "turf" battles will not achieve the vision of the 2030 Agenda. This report aims to highlight the importance of keeping the focus on the big picture of how to achieve the transformative potential of SDGs. In order to do so, the report argues that more ambitious and strategic policies and comprehensive institutional reform are needed at the national level.

The need for transformative policies for socio-economic development is not new. Many previous plans have been proposed before, such as Agenda 21<sup>1</sup> and the Millennium Development Goals,<sup>2</sup> although they have not been well-implemented, and progress has not matched expectations (Sachs, 2015; Tollefson & Gilbert, 2012). Many political decision makers, as well as ordinary citizens, have not been persuaded about the necessity or urgency of adopting more transformative approaches, and instead, have opted to continue the conventional approach of dirty growth and wealth first and clean up later (if at all). Also, many companies and business lobbies have actively intervened to impede any real progress that would disrupt business as usual, particularly in sectors such as electricity generation, manufacturing, and mining.

However, it has become clear that the conventional approach has reached its limit, as escalating economic and health damages from climate change and environmental



pollution, increasingly fierce competition over dwindling natural resources, and growing inequality are undermining the foundations of human wellbeing and prosperity, and even economic growth itself, making the need for a different approach more urgent than ever. Planetary boundaries have been breached or are in danger of being breached, with uncertain prospects for reversibility (Rockström et al., 2009; W. Steffen et al., 2015; Will Steffen et al., 2011).<sup>3</sup>

Improved environmental sustainability is a prerequisite for continued development at all scales, from the local community to the national and regional levels. Rapid economic development, along with large scale resource and energy consumption have caused substantial environmental damage and stress on the region's air, land, freshwater, ecosystems, biodiversity, and forests (Millennium Ecosystem Assessment, 2005). A majority of the world's mega-cities are located in Asia and urbanisation is progressing rapidly.<sup>4</sup> These expanding urban centres require vast amounts of natural resources for infrastructure development and act as hubs for escalating levels of consumption and production. In 2005, the region overtook the rest of the world in consumption of primary resources (Schandl & West, 2010). High levels of air, water, and soil pollution result in large health and social costs, and even negatively affect industrial production and economic activity, thereby undermining the longer-term prospects for sustained prosperity and wellbeing (UNEP, 2016).

The Asia-Pacific region is home to over 4.2 billion people who legitimately desire improved living conditions. Rapid economic development was achieved by many Asian economies during the last few decades (IMF, 2014), along with rapid population growth and urbanization. In the region, not only have millions of people escaped poverty and improved their quality of life (ESCAP, 2014; ESCAP, ADB, & UNDP, 2015), but also about 700 million people have become middle-to-high income consumers. Still, many millions remain impoverished and are living in slums, while many of those who are just above the poverty line remain vulnerable and could easily fall back into poverty. Inequality is rising between and within many countries, stoking social tensions. The obsolete model insistent on continuous growth, with a few people getting super rich, and then possibly cleaning up later, has reached its physical limit. Continuation of this outdated growth paradigm will not be able to finish the job of eliminating poverty and may even cause a resurgence of poverty as the earth's ability to support human well-being is being steadily degraded.

This report argues that every nation in the region needs to adopt new development pathways which do not systematically harm the planet's climatic, atmospheric, geophysical and ecological processes, while supporting human life and wellbeing. A



few countries have made some progress in making this transition, but the vast majority have not. No country currently meets humanity's basic needs at a globally sustainable level of resource use (O'Neill, Fanning, Lamb, & Steinberger, 2018). The global Agenda 2030 and its associated sustainable development goals (SDGs) provide a once-in-a-generation opportunity to mobilise additional resources to start shifting to a sustainable form of development – one that can achieve social wellbeing in Asia-Pacific while ensuring the environmental integrity necessary to support it.

The rest of this report is organised as follows. Chapter 2 observes that current discussions on SDGs may be putting too much emphasis on data and measurement of narrowly focused indicators and makes the case for quickly shifting the discussion to the policies that should be adopted by governments to fulfil the transformative promise of SDGs. Chapter 3 explains in more detail how current trends are undermining human wellbeing and prosperity. Chapter 4 outlines a range of policy approaches that could bring about transformation, pursuing prosperity and development on a resilient ecological basis. Each of these strategies address multiple SDG targets and cut across conventional policy domains. In doing so, they illustrate what an integrated approach to implementation could look like in practice. Chapter 5 discusses how governance and institutions can be strengthened to implement more transformative policy approaches, while Chapter 6 concludes.



## 2. FROM INDICATORS TO ACTION: REALIZING THE TRANSFORMATIVE PROMISE OF SDGS

While many countries in the region have embraced the SDGs and have quickly begun efforts to establish implementation structures and link SDGs with their national planning processes, there is still some uncertainty about how to proceed concretely, partly due to the complexity of the SDGs framework. A database of the Voluntary National Reviews (VNRs) submitted to date is available online.<sup>5</sup> The 2017 Synthesis Reports of the VNRs submitted concludes that only one-third of countries addressed all of the SDGs (UNDESA, 2017). “Several countries included sections on the challenges they are facing with the implementation of the SDGs.” Moreover, attention of many governments, as well as policy research institutes and NGOs, is now shifting from the broad overall direction of the goals and targets to the narrow focus of the indicators.

The 231 indicators to measure progress on the SDGs resulted from an open-ended process led by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs), which was mandated by the UN to develop indicators that could capture the multi-dimensional nature of the 2030 Agenda and its goals and targets. This is a complex task, and given the legacy of unidimensional measures of development progress of the past, the current indicators are at various stages of development and usefulness (Zhou & Moinuddin, 2016). Some indicators are clear and already have related data being widely collected; others may be clear conceptually, but data may be unavailable or non-existent. Several indicators are both unclear and lacking available data. There have been calls for a “data revolution,” declarations of the “era of big data,” and significant political, human and financial resources are being directed towards data-related initiatives (IAEG-SDGs, 2014).

In this context, there is a risk that SDG implementation could become primarily a data development and statistical exercise, a kind of development-by-numbers approach. Some countries may spend a disproportionate effort on collecting numbers to report on their VNR score cards rather than taking concrete measures to score real goals to achieve meaningful improvements in human wellbeing. In addition, the complexity of reporting on the multi-dimensional SDGs may become a significant reporting burden for some governments, especially least developed countries and small island developing states, which in turn could divert resources from implementation. If these



concerns are not addressed, some countries might end up with not only poor report cards but literally poorer societies – economically, socially and environmentally.

Undoubtedly, efforts should continue to develop the indicators and related data, as what gets measured usually gets done. However, many of the indicators only focus on narrow aspects of the goals and targets, may actually water down the objectives. For example, Target 11.b includes integrated policies on inclusion, resource efficiency, resilience, climate mitigation and adaptation, and disaster risk management. However, the indicator only includes disaster risk management. Target 3.9 has a broad focus on death and illness from pollution, but the indicator (3.9.1) includes only one very specific type of pollution (household ambient air pollution), excluding others, and only includes deaths, excluding disease caused by pollution. Data development for many indicators will take a long time if it can be achieved at all. It may be a case of forgetting about the forest ecosystem while counting the trees.

Moreover, although countries agreed that the SDGs should be implemented in an integrated manner rather than in the traditional 3-pillar silo approach (treating the environmental, economic, and social aspects of development separately), on the ground, many officials responsible for implementing the SDGs are not necessarily persuaded that environment and development can be pursued synergistically. Moreover, even if they could be persuaded, many of them may not necessarily have the mandate, resources, or capacity to act in an integrated manner.

There are two major risks for the future of SDG implementation in this situation that would obstruct their transformative potential. First, measures adopted to implement the SDGs may focus too narrowly on specific indicators, thereby continuing the predominant sector-based silo approach, and missing the opportunity to adopt more transformative measures. Second, there is a risk that the environment could be sidelined in favour of conventional economic and social goals, as these tend to be easier to monitor on a consistent basis.

In response to these risks, it is important to ensure SDG implementation focuses on the big picture. This big picture focus suggests the case for an integrated approach with strong synergistic linkages to the environment, and a set of broad measures that can help promote the SDGs in a more transformative manner. For example, in the VNR for Bangladesh the SDGs have been integrated into the 7th Five Year Plan (2016-2020) and Bangladesh has “adopted a “Whole of Society” approach to ensure wider participation of NGOs, development partners, private sector, media and CSOs in the process of formulation of the Action Plan and implementation of the SDGs.”<sup>6</sup>



### 3.CRITICAL TRENDS OF ENVIRONMENT AND DEVELOPMENT

The environmental impacts of conventional development models are undermining development progress itself (Akenji, Bengtsson, Bleischwitz, Tukker, & Schandl, 2016). This is the message clearly emerging from practice and scientific analysis, such as the work on planetary boundaries (Rockström et al., 2009; Will Steffen et al., 2015). By continuing along conventional lines countries in Asia-Pacific risk jeopardising development gains by deteriorating human health, food insecurity, severe water shortage and a range of other problems caused by conventional unsustainable development (UNEP, 2016).

The environment has suffered considerably from the Asia-Pacific's rapid economic growth. The environmental costs of economic growth are now beginning to put at risk the region's development achievements and socio-economic stability (Sachs, 2015; UNEP, 2005, 2016; Zhang, 2012). Moreover, overall consumption and resource use will probably increase significantly as a result of continued increases in urbanization, population, new middle class prosperity, and poverty reduction. Certainly, living standards have greatly improved, but the traditional economic growth model which achieved this may jeopardize further progress or even put current achievements at risk. The current development model is not capable of ending poverty or achieving prosperity and wellbeing for all. This section summarises key trends in environment and development. These trends demonstrate the need for strong and ambitious measures to reverse environmental degradation in order to achieve Agenda 2030's aspirations to transform our world.

#### 3.1. RISING COSTS FROM CLIMATE CHANGE AND VULNERABILITY

The Asia-Pacific region accounted for over half of global GHG emissions by 2016 (ESCAP, 2016). Although the Asia-Pacific region was not historically the largest contributor to GHG emissions, the impacts of climate change are felt strongly in this region. Asia is urbanizing rapidly, but about half of its population still lives in rural areas (ESCAP & UN-Habitat, 2015), and more than 80 percent of its rural people are dependent on agriculture for their livelihoods. Climate change is expected to reduce rice yields over much of the continent and increase the frequency of food production



shortfall events (when harvests fall 50 percent or more below the production in an average year), possibly from around two years per decade under normal climate to five-to-six years per decade in the 2070s (ADB, 2015).

Climate change and related disasters are already imposing significant economic costs, and poorest countries are suffering the most (Asian Development Bank, 2013). Although not every natural disaster is attributable to climate change, it is recognized that climate change may be contributing to their increased frequency, intensity, and resulting damage (IPCC et al., 2012). For example, flooding in Bangladesh, made worse by climate change, costs about \$1 billion a year, about six-to-seven per cent of the government's annual budget (UNEP, 2014). Other countries have suffered from unanticipated calamities. The disastrous flood in Thailand in 2011, although not directly correlated to a changing climate, cost an estimated \$45.5 billion in losses and damages (World Bank, 2012).

Costs from climate change and related disasters are expected to increase in the future. Therefore, investments in resilient infrastructure will be needed to reduce the impacts of extreme floods, droughts, storms, and sea level rise. The Asian Development Bank (ADB) estimated that four countries – China, Japan, South Korea and Mongolia – may need to pay a combined \$23 billion per year up to 2050 to “climate-proof” their infrastructure (ADB, 2013).

Because climate change is expected to disrupt freshwater supplies, maintaining water services and extending supplies to unserved areas will probably require more than US\$500 billion per year up to 2030 globally, with over 85 percent of this for Asia and Africa (IPCC, 2014). Increasing incidence of extreme heat waves is already disrupting daily lives in many countries in the region, causing large numbers of fatalities, and reducing economic productivity. By the end of the century, under business as usual, parts of South Asia will be too hot for human survival, especially for workers outdoors (Im, Pal, & Eltahir, 2017).

Climate change is also negatively affecting human health (Butler, 2014; Watts et al., 2015). This is not just related to direct effects of warming. There are also increasing concerns about indirect effects through food production, conflict, and migration (Butler, 2014; King, Schrag, Dadi, Ye, & Ghosh, 2015).

Expanded climate mitigation measures would help to lower the costs of climate adaptation, disaster response, and enhanced resilience (ESCAP, 2016). Likewise, these costs will probably increase if stronger measures to mitigate climate change are not taken, putting the region's development at risk (Stern, N. H., 2007).



### 3.2. FOOD, WATER AND ENERGY INSECURITY

The World Economic Forum (WEF) has identified a global water crisis as one of the top ten global risks. This includes heightened risk of droughts and floods, overconsumption of groundwater, and worsening pollution. Increasing shortages of water for drinking and agriculture will be exacerbated by increasing population and urbanization. Moreover, water shortages could contribute to possible political and military conflict in some areas (WEF, 2018). Pollution from economic activities threatens drinking water quality, especially in areas where poor people live. Water, food, and energy issues are closely and increasingly interlinked, and thus cannot be addressed separately (Akenji et al., 2016). Growing populations, increasing demand from multiple sectors, and limited availability of resources (made more uncertain by the impacts of climate change) call for urgent action.

Water is necessary not only for household use and for agriculture, but also for most energy production, including coal-fired and nuclear electric power, coal mining, and hydro-fracking. About 15 percent of the world's water is used by the energy sector (IEA, 2012). Many countries in the region, especially China and India, experience water-stress, which is expected to become more severe. The energy sector will increasingly compete for water with the agricultural and household sectors, due to expected increases in demand for energy. This situation is expected to intensify in the future, as 60 percent more food will be required in order to feed the world in 2050. This trend will happen alongside a projected increase of up to 50 percent in global energy consumption, and a 10 percent increase in global water withdrawals for irrigation (IEA, 2010).

Food security is at risk from worsening pollution, land-use changes, unsustainable agricultural practices, and unsustainable food systems. Black carbon and ozone pollution are harming food productivity in Asia (Nawahda, Yamashita, Toshimasa, Kurokawa, & Yamaji, 2012; UNEP & WMO, 2011). International food markets have put fisheries resources at risk, depleting fish stocks that underpin local food security, particularly in developing countries (Villasante et al., 2012). Indonesia's mangroves have been lost to shrimp aquaculture, logging, coastal development, and chemical pollution (Lenzen et al., 2012). Fish stocks are falling sharply due to over-fishing. Research examining different scenarios suggests that climate change has the potential to severely impact marine ecosystems, particularly in the tropical regions, causing "... up to 50 percent decrease in 10-year averaged maximum catch potential by 2055" (Cheung et al., 2010).



Asia accounts for 87 percent of people working in the fisheries and aquaculture sector. The Asia Pacific region dominates world aquaculture and food markets, and accounts for almost 90 percent of global production. Marine and coastal pollution is therefore an increasing problem in the region (FAO, 2016). Worsening pollution, increasing competition between water users, and extreme climatic events are endangering the security of water systems, from the very local to global level. The issues around food, energy, and water are often referred to as a "nexus," reflecting the strong interconnections among them (Ngoc Bao, Mitra, & Kuyama, 2015). The intensifying competition over these resources makes it increasingly important to manage them in a cross-sectoral integrated manner. Strategic planning and management of these critical resources will be essential for securing future development (Shivakoti et al., 2015).

### 3.3. WORSENING HEALTH AND RISING COSTS FROM AIR AND OTHER POLLUTION

Air pollution is a major threat to human health and wellbeing, especially in the Asia-Pacific region. Outdoor air pollution is estimated to cause over 2.5 million premature deaths in the region. Also, indoor air pollution caused around 4.3 million premature deaths globally in 2012, the majority of which were in the Southeast Asian and Western Pacific sub-regions accounting for 1.69 and 1.62 million deaths, respectively (WHO, 2014b). Increasing air pollution is mainly caused by fossil fuel combustion, the increase of private transport motor vehicles, and inefficient use of energy in the building sector, including the use of biomass for cooking and heating (WHO, 2014a).

WHO estimates the environmental contribution to the burden of disease in Asia-Pacific (which includes Southeast Asia and Western Pacific sub-regions) to be 24 per cent of the total burden of disease (Global Burden of Disease, 2017).

### 3.4. UNSUSTAINABLE CONSUMPTION

The Asia-Pacific region is now the largest user of natural resources globally. Over the last three decades, the region's share of world domestic material consumption has increased from just under 25 percent in 1975 to over 53 percent by 2005, accounting for nearly 85 percent of global total growth. Domestic material consumption has increased 4.9 percent annually over the three decades from 1975 to 2005; the corresponding growth rate for the rest of the world was around 0.5 percent (UNEP, 2011).



From 2015, for the first time in several hundred years, the number of middle-class consumers in Asia reached the same level as in Europe and North America. It is further estimated that by 2021, there could be over 2 billion people in middle-class households in Asia-Pacific (Kharas, 2010). The campaign to eradicate poverty has achieved important successes, with significantly increased average household expenditures per capita boosting material consumption in the region. Moreover, the region's consumption is not only increasing in volume, but it is also shifting to more resource- and energy-intensive goods and services (Akenji, 2012). For example, food consumption has shifted away from staple cereals toward meat, dairy products, fruits, and vegetables, due to urbanization and the rising middle class. As a result, in 2010, China's soy bean imports accounted for more than 50 percent of the global soy market. Meat consumption also is increasing rapidly in many Asian countries, and it has been estimated that more than half of the world's feed crops will soon be consumed by pigs in China (Economist, 2014). Region-wide the trend is similar. Between 2000 and 2030, almost half of the global increase in the annual consumption of beef (12.5 million tonnes of the expected global increase of 25.4 million tonnes) will be from this region (FAO, 2011).

Many people would see these trends not as problems but as successes of the dominant economic paradigm. However, the rapid economic growth and increased consumption in this region has clearly come at a cost. Resource use and corresponding emissions have grown faster than anywhere else, and many countries have reached the limits of domestically available resources, leading to increasing net imports. The material requirements for the Western mode of meeting individual and societal needs is already having significant and growing implications for the consumption of energy, natural resources and lifestyles in Asia-Pacific. At an individual level, for example, obesity is increasing, with 40.9 percent of adults in the region overweight compared to 34.6 percent in 1990, with the attendant health risks (Helble & Francisco, 2017).

### 3.5. IMPLICATIONS OF NATURAL RESOURCE SCARCITY FOR PEACE AND STABILITY

Natural resource scarcity and environmental degradation are contributing to traditional national security risks (Barnett & Adger, 2007; T. Homer-Dixon, 1999; T. F. Homer-Dixon, 1991). In this region, the increasing impacts of climate change coupled with rapid economic growth are already signalling the potential to jeopardise peace and stability. Growing and urbanizing populations want ever more resources, and they are increasing pressure on governments for sufficient food, water and energy, as well



as decent work; and to buffer society from the negative effects of untamed economic competition. Migration often results when there are not enough opportunities for human development, and this may lead to political tensions and conflicts within and among countries. Competition is intensifying between countries and groups to secure access to increasingly limited natural resources such as fisheries, hydrocarbons, and seabed minerals. Ongoing disputes and potential conflicts involving shared ecosystems and estuaries such as fishing zones, and resource-rich islands in the region demonstrate the close link between sustainable resource management and peaceful sustainable development.

Possibly the most extreme example is the shrinking land area due to sea level rise and the possibility of millions of climate refugees, either becoming domestic displaced persons or risking illegal migration into neighbouring countries or further afield. Recognizing this possibility, New Zealand plans to create a new refugee visa for climate refugees, anticipating that many Pacific Island atolls will eventually become uninhabitable (Pearlman, 2017). Other small island developing states are purchasing land in other countries as a fall-back if climate adaptation strategies are not sufficient (Jarvis, 2010). While such slow onset events may not have the same impact as a major military conflict the number of possible climate refugees could trigger instability in source and destination countries.



## 4. TOWARDS TRANSFORMATIVE POLICIES: SCORING THE WINNING GOALS

This section outlines a range of policy approaches that could lead to more transformative results. Up to now, a major emphasis of global discussions on SDGs has been on developing the indicators, fostering a data revolution to develop data for the indicators, and analysing the quantitative linkages between the indicators. Less effort has been devoted to developing policy and programme recommendations to actually achieve the SDGs. Nevertheless, it is important to avoid a fragmented effort to establish individual policies or programmes to separately address 169 targets and 231 indicators, or to establish a small set of narrowly focused policies to address a small set of prioritized targets and indicators, which could result from the focused attention on indicators. Instead, it is argued here that the discussion of solutions and policies should start from more strategic set of broad policy directions which could simultaneously address a broad range of interlinked SDGs and targets.

These strategic directions are not really new. A broad range of policies and measures was proposed in Agenda 21, the Johannesburg Plan of Implementation, and the Millennium Development Goals (MDGs), but these were seen as mainly aimed for developing countries. The SDGs, however, are intended to be universal, indivisible, and leave no one behind.

In principle, the SDGs were not intended to prescribe specific means for implementing particular goals. Rather, the SDGs aimed to establish an integrated set of broad goals instead of specific solutions, thereby avoiding a debate about the relative merits of various alternative means. Instead, it was agreed that individual countries could implement the SDGs according to their specific national circumstances, allowing a range of possible ways to achieve the SDGs.

Nevertheless, SDGs also included general means of implementation in Goal 17 as well as some specific MOI targets listed under the other goals. These were generally about traditional broad concepts of capacity such as finance, technology, and trade, and not about detailed ways to achieve specific goals or targets. For example, it is estimated that USD 2.5 trillion per year is the investment gap for delivering the SDGs in developing countries (OECD, 2018), but the SDGs don't indicate how this finance should be mobilized. Moreover, in some SDGs, more specific means of implementation were indicated, such as integrated water management. Overall, some SDGs themselves



can be broadly thought of as means to achieve other goals. Energy is a key example, since it is a key means of implementation for addressing goals such as climate change, poverty reduction, access to water and sanitation, and growth/jobs (Elder, Bengtsson, & Akenji, 2016).

The countries in the Asia-Pacific will not be starting from scratch to implement the SDGs. Many already have developed innovative strategies that show an emerging understanding of the risks to long-term development associated with a deteriorating natural environment. These efforts can be seen through efforts to limit pollution, increase resource and energy efficiency, and to reflect less materially driven human aspirations, such as happiness, in national policy. Japan's national development strategy includes a vision of a Sound Material Cycle Society, interpreted in practice through the 3Rs: reduce, reuse, and recycle. For the vast and still rapidly expanding economy of China, the leaders have expressed their intention to build an Ecological Civilisation, one which is "frugal in their use of energy and resources and protects the environment." Thailand has developed the Sufficiency Economy approach to guide its development, with a vision to build "a happy society with equity, fairness and resilience." Reflecting this principle, Thailand's National Economic and Social Development Plan (NESDP), the nation's strategic framework for addressing its medium-term development challenges, promotes "balanced development" and has shifted emphasis from economic to people-centred development. Leading by example, the Kingdom of Bhutan has declared that the purpose of development is to create the enabling conditions for happiness of individuals and society. Gross National Happiness as a development approach seeks to "achieve a harmonious balance between material well-being and the spiritual, emotional and cultural needs of an individual and society" (UNEP, 2012).

However, these efforts are just a beginning. They need to be expanded, extended, and scaled up, rapidly. Despite the serious environmental challenges facing the region, countries in the Asia-Pacific region have ample opportunities to move towards more sustainable development paths with minimized adjustment costs if they act sooner rather than later. Many countries are still at early stages of the development process, and there is a strong probability of substantial investments in new infrastructure over the next few decades. Investing in sustainable infrastructure at this stage will avoid the economic and social costs of environmental damage caused by unsustainable infrastructure as well as costs of removing and replacing it with more sustainable infrastructure later. Sustainable infrastructure would use fewer resources and provide greater benefits for disadvantaged populations.



Otherwise, countries risk being locked into costly, high-polluting, resource-intensive, and high-carbon pathways for several decades. Leapfrogging to smarter solutions than even those commonly found in wealthy countries is necessary for resilient development and lasting prosperity. However, given the current speed of urbanisation and infrastructure construction in the region, realising such opportunities requires an urgent shift away from business-as-usual practices.

The next part of this section identifies a set of policy options which, approached as integrated elements of a framework for sustainability, could help to accelerate the transition to sustainable development in Asia-Pacific. It is based on a more systematic understanding of key leverage points for changing the current development model. All these areas for action offer benefits for both environment and development, and they have the potential to yield high societal returns on investment. According to (Hermwille, Obergassel, & Arens, 2015) "to determine the transformative potential of policy instruments, it is necessary to assess whether a proposed instrument opens up space for new and more sustainable socio-technical configurations or whether it closes down incumbent unsustainable ones." Given the urgency to find transformative pathways outlined above, the following policy options are viewed, therefore, through this lens of opening or closing socio-technical and socio-ecological niches or disrupting business as usual (UNRISD, 2016).



## 4.1. STRENGTHEN RESILIENCE TO DISASTERS AND ENVIRONMENTAL SHOCKS

The Asia-Pacific region is prone to natural disasters and highly vulnerable to the adverse impacts of climate change. To protect people's lives, livelihoods, and wellbeing, and to safeguard development progress, the region needs to give much higher priority to climate change adaptation and disaster prevention and preparedness (Prabhakar, 2014).

Protecting communities across the region from the adverse effects of climate change requires multi-pronged approaches and measures to ensure the safety of citizens, the security of livelihood assets, as well as the health of ecosystems and their services. Also, it is necessary to enhance the resilience of key economic sectors and infrastructure, including erosion and flood protection, irrigation, drainage, and beach nourishment, as well as to promote alternative livelihoods and develop markets for new products. For example, cities in vulnerable locations should upgrade existing infrastructure and ensure that new construction is more resilient. Slum areas are generally at significant risk, so it is quite urgent to improve home construction quality, waste collection, and drainage canals in vulnerable areas. Rural areas, which are home to many low income people, are also at risk and need to enhance their resilience. Possible measures include introducing more adaptable crop varieties and efforts to safeguard local ecosystems.

Revitalizing and protecting ecosystems is especially important. Ecosystem-based adaptation measures, particularly for coastal ecosystems, would help to protect against potentially catastrophic damage. Many National Adaptation Programmes of Actions (NAPAs) developed by least developed countries have recognized the value of ecosystem services, and more than 20 percent of their national initiatives have mobilised ecosystem services in support of other adaptation activities, including infrastructure, soil conservation, and water regulation. A wide range of adaptation measures are also included in the new round of National Adaptation Plans<sup>7</sup> and Nationally Determined Contributions<sup>8</sup> to the Paris Agreement.

Early warning systems and the ability to implement mass evacuations can significantly reduce the effects of disasters, so establishing or strengthening these systems needs more attention by policymakers. Experience shows that there is a limit to what can be achieved through improved technical infrastructure and that public awareness and knowledge can be critical to limiting impacts. Still, disasters will occur, even with good



preparation, so capacity for longer-term recovery and rebuilding is also needed, not just emergency relief. Insurance schemes can help ease the burdens of affected households, businesses and communities. However, many low-income households do not currently have their homes and livelihood assets insured. Making insurance more accessible and affordable for such groups is a complementary action that can significantly improve post-disaster recovery efforts. There are elements of a regional support system in place already to support such multi-pronged disaster resilience, but with the expected increase in natural disasters, there is a need to reinforce these regional frameworks (Sivapuram et al., 2015).

Countries' overall development strategies need to incorporate measures to strengthen resilience to climate change and extreme weather events. There are major synergies between disaster resilience, climate adaptation, healthy ecosystems, and sustainable development. Resilience and climate adaptation measures can yield positive synergies or co-benefits for sustainable development, including alleviating poverty, provided resilience and climate adaptation considerations are taken into account in the initial design of development projects. Likewise, aspects of sustainable development which can facilitate resilience include policies to improve education and health. Climate adaptation strategies can yield welfare benefits, including more efficient use of water and more robust crop varieties. To capitalize on these synergies, resilience and climate adaptation thinking should be mainstreamed into strategic planning and policy making at all levels of society.

## RESILIENCE AND SDGS

All the SDGs relate to resilience in a broad sense, as can be seen in





Figure 1. Five Goals have resilience targets, including poverty elimination (SDG 1), water and sanitation (SDG 6), sustainable industrialization (SDG 9), sustainable cities (SDG 11), and climate (SDG 13). Seven goals have a variety of targets, which achieved, would contribute to enhancing resilience, and therefore could be considered as means to achieve resilience. Likewise, the achievement of four other goals (SDGs 3, 5, 8, and 10) would be furthered by the achievement of the five SDGs with resilience-related targets. Thus, for example, reducing hunger, enhancing the sustainability of agriculture, increasing energy efficiency, increasing renewable energy, and making production and consumption sustainable all contribute to enhanced resilience. Likewise, efforts to enhance resilience can promote economic growth and jobs (SDG 8) while reducing inequality (SDGs 5 and 10). This is just a rough illustration, and the direction of causality can run in various directions both between and within goals. For example, in the water goal (SDG 6), the target indicating resilience (target 6.6 on the protection and restoration of water-related ecosystems) can be considered as a means to target 6.1 on universal access to safe water.

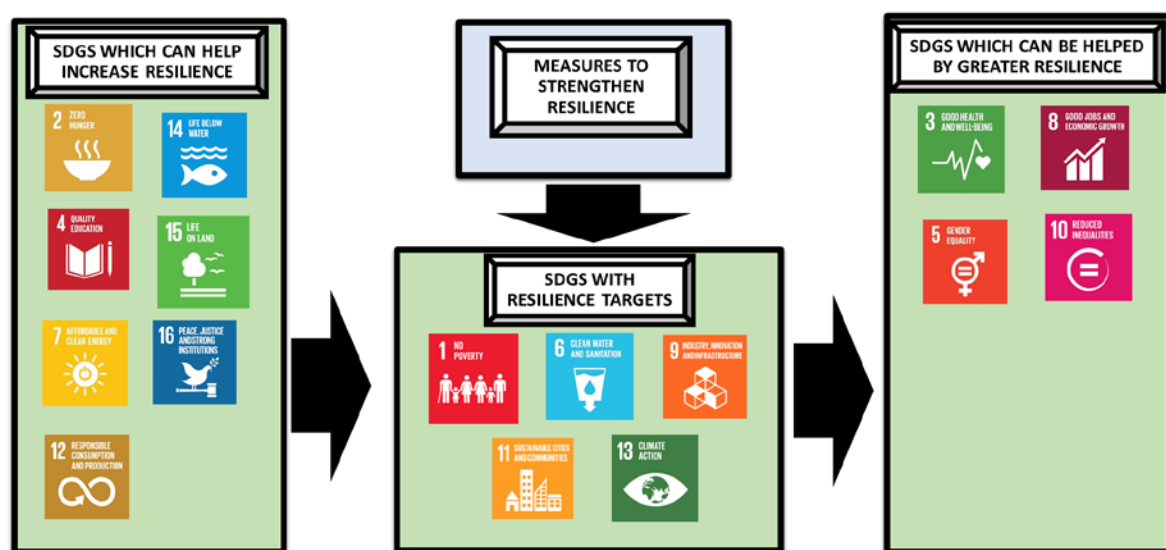


Figure 1: Enhanced Resilience and SDGs



## 4.2. FULL DECARBONIZATION

The Asia-Pacific region's current development path is carbon-intensive. Many countries in the region still have low average per-capita emissions, but the middle-income countries have already reached emission levels that are incompatible with a safe global climate. Stabilising per-capita emissions of GHGs at significantly lower levels offers a great leapfrogging opportunity for the region, which would bring multiple benefits, including enhanced energy security, improved air quality and reduced water demand, and green jobs (due to the labour needed for constructing climate-smart buildings and other infrastructure, and to install and maintain renewable energy facilities) (Asian Co-benefits Partnership, 2016b).

Such transformations are fully possible and require progress mainly in two areas: increasing energy efficiency and shifting to renewable energy sources. Increasing energy efficiency should be obvious since the investments provide a basically guaranteed return. There is a large potential for energy efficiency, in many cases at low or even negative cost. According to the International Energy Agency, "70 percent of global energy consumption is not subject to mandatory efficiency standards targets" (IEA, 2016). Economic incentives and regulations need to work together to accelerate the introduction of energy efficiency measures.

In addition, the cost of renewable energy has declined dramatically in recent years, and it is now cost competitive with fossil fuels in many areas. According to IRENA, "by 2020, all mainstream renewable power generation technologies can be expected to provide average costs at the lower end of the fossil-fuel cost range" (IRENA, 2017). The cost advantage of renewable energy is expected to increase in the near future due to advances in technology and increased scale of production. Various policies have helped to drive the price of renewable energy well below the fossil fuel alternatives in several countries. Still, government interventions can further accelerate these trends. Additional government intervention may be needed to strengthen and connect electricity grids, for example across state or national borders.

Recent policy approaches include promotion of energy service companies that can provide the up-front capital costs that may deter households and businesses from implementing off-grid solutions. In Adelaide, Australia, some 50,000 households will be provided with rooftop solar panels free of charge, and only pay a minimal electricity bill, thus creating a virtual power station<sup>9</sup> in combination with Tesla's 100 MW big battery, a wind farm, and household level Powerwall batteries.



Currently, governments in many countries subsidise electricity and fossil fuels, which encourages unnecessary and wasteful use and large unnecessary costs. Phasing out fossil fuel subsidies is one of the easiest and most effective ways to strengthen the incentives to invest in energy efficiency, shift consumption away from fossil fuels towards renewable energy, and generate revenue for other sustainability investments. Such policy reforms may require complementary measures, probably using part of the revenue savings, to protect low-income groups from being negatively affected. In many countries, buildings account for a large share of energy consumption. Stronger building codes with strict energy efficiency requirements could be a powerful incentive to significantly upgrade the energy efficiency of buildings. Promotion of new business models that encourage energy saving, such as energy service companies that charge customers for services such as cooling, heating, or lighting rather than for energy itself, can be both environmentally and economically beneficial.

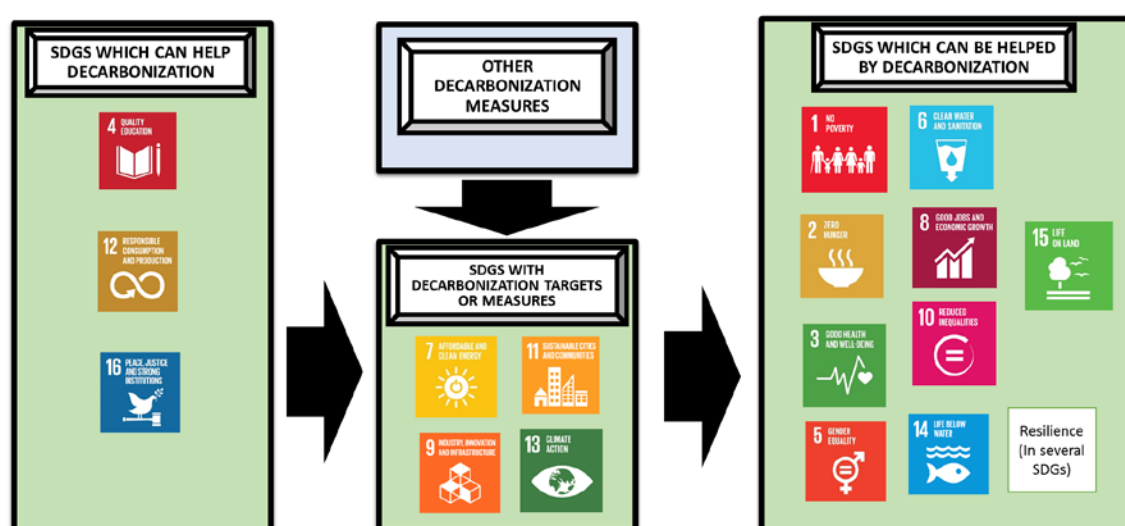
Despite many private sector initiatives, government support and innovative policies play a key role for accelerating the adoption of renewable energy. Energy infrastructure investment is long-term. Therefore, it is important to maintain investor confidence so governments should send clear signals that they will not suddenly reverse policies. Europe's experience demonstrates the importance of institutional arrangements and innovative business models for accelerating the adoption of renewable energy (EC, n.d.). Notable examples include separating the ownership of power generation facilities from the transmission grid and facilitating the establishment of small to medium-scale energy generation co-operatives.

Resilience can be bolstered through the construction of low-carbon societies, powered mainly by renewable energy. Energy generated from wind and sunlight is more widely distributed in contrast to fossil fuels. Renewable energy sources, therefore, are especially suited for powering localised systems of production and consumption. Countries at earlier stages of development have the opportunity to build new infrastructure and power systems which are already optimized to use renewable energy sources. Building societies around the characteristics of fossil fuels and later trying to convert those to run on renewable energy is likely to be costly. Electrification in rural areas and small island developing states is a priority development objective which should use renewable energy sources, often off-grid, as much as possible.

Finally, while fossil energy is still being used during the process of transition to renewable energy, it is important to ensure that it is used as efficiently as possible. Also, fossil fuels with relatively lower carbon intensity, such as natural gas, should be prioritised over more polluting ones, wherever possible.



Climate-related linkages among all the SDGs are indicated below in Figure 2. The climate goal (SDG 13) is not the main goal with measures to decarbonize economies. Much larger roles are played by other goals, particularly the energy goal (SDG 7) which increases energy efficiency and promotes renewable energy, sustainable industrialization (SDG 9), and sustainable consumption and production (SDG 12). The most notable result of this exercise is the observation that a majority of the other goals (9 goals out of 17) will benefit from decarbonisation efforts, including poverty reduction (SDG 1), food security (SDG 2), better health (SDG 3), access to clean water (SDG 6), and others. A key role is played by SDG 8, the main so-called “economic” goal. SDG 8 could easily be classified as contributing to decarbonisation or as a goal with a decarbonisation target, because of target 8.4 which calls for decoupling economic growth from environmental degradation. This is arguably one of the most important environmental targets in all the SDGs. This report classifies SDG 8 as benefitting from decarbonisation because measures to decarbonize economies (including renewable energy, energy efficiency, sustainable industrialization, and sustainable consumption and production measures) will make a major contribution to the creation of decent jobs. Finally, based on the discussion in the previous section, Figure 2 notes that decarbonisation measures also make a major contribution to resilience. Even though resilience is not specifically listed as an SDG, it is directly included as an “objective” in several other goals, as discussed in the previous section.



**Figure 2: Decarbonize Economies**



### 4.3. ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION

The Asia-Pacific region is rich in natural resources, but this wealth is rapidly decreasing. This region now consumes more resources, including minerals and ores, fossil fuels and biomass, than the rest of the world. This is partly due to the region's huge population and its production of large volumes of goods that are exported and consumed in foreign markets. This massive mobilisation of materials contributes to a range of serious environmental problems, including climate change (from GHG emissions), loss of biodiversity and ecosystem functions, and pollution (UNEP, 2011). In addition, freshwater reserves and fertile topsoil – both of key importance for meeting basic needs as well as for supporting economic prosperity – are under severe pressure.

As a result of the booming demand for natural resources, the region is increasingly dependent on imports from outside the region. This trade can alleviate the pressure on the region's own ecosystems and resource stocks somewhat, but then the pressure and related problems are shifted to other regions. Dependence on natural resource imports also increases exposure to geopolitical risks and dependence on potentially volatile global markets. Supply disruptions and price spikes for commodities can disrupt businesses, harm low-income groups, and foster social unrest. Surging resource demand from Asia can also have negative environmental impacts on exporting regions, damaging ecosystems, harming human health, and reducing the resources available for meeting domestic demands. Therefore, countries in the region need to find ways of using their natural wealth more wisely – not only considering short-term economic gains but also to secure resources to support wellbeing and prosperity over the longer term in a sustainable manner.

Scaling back the region's consumption of materials requires a transformation in production and consumption systems. Shifting to sustainable consumption and production (SCP) would not only help secure the environment for human welfare, but it would also help to address many of the social priorities of the countries in the Asia-Pacific region: poverty eradication, sustainable livelihoods, equity, thriving small and medium size enterprises (SMEs), energy security, etc. In fact, an aggressive push towards SCP is most applicable to the circumstances of this region, which is often regarded as the "world's factory" and the emergence of a booming middle-class (Akenji, 2012; Akenji & Bengtsson, 2014).



No single policy by itself can successfully engineer a shift to SCP; well-designed mixes of policy tools are needed, tailored to the resource use patterns in individual sectors and countries, based on national circumstances. The conventional way of approaching SCP in developed countries – mainly relying on eco-labels and consumer information – has been found to have limited potential and needs to be supported by complementary measures (Akenji, 2014). For example, regulation of products and services also needs to be modified. Governments have traditionally used criteria such as health, public safety, and security to develop such regulations; with new knowledge of the risks of unsustainable production and consumption it is now necessary to use sustainability criteria to set minimum product/production standards, and establish licensing/permit systems for business practices, etc.

Other policy action areas include: (i) green tax reforms that shift taxes from income to resource consumption and pollution; (ii) promotion of less materialistic lifestyles focused more on wellbeing; (iii) shifting emphasis to social relations and work-life balance and away from material possessions; (iv) education that provides life skills for self-provisioning, such as do-it-yourself, gardening and sewing; (v) regulation of consumer loan schemes and advertising that contribute to consumerist mind-sets; (vi) business models based on leasing and sharing, which can limit the need for private ownership of products; (vii) requirements for long product warranties and reparability; and (viii) multi-purpose buildings, which can limit the overall demand for floor-space. Many of these areas resonate with traditional Asian practices and values but go against the dominant development model with its emphasis on economic expansion, consumerism, and individualism.

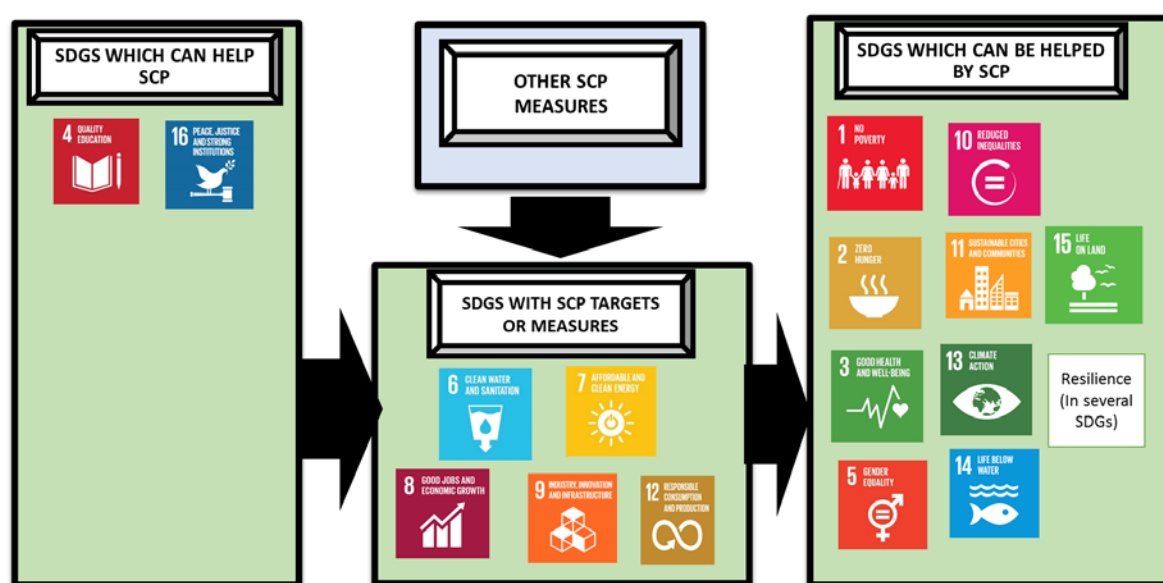
A transition to SCP needs to influence culture and social norms and should engage existing traditional values and practices. Therefore, it is necessary to mobilize religious, cultural, academic and political organisations - custodians of our cultures and institutions that shape norms and behaviour. Working with the media, including not only the news media but also the broader entertainment industry, to influence the images it conveys of desirable lifestyles and consumption patterns is another important avenue. Such a transition also involves protecting traditional practices, such as community-based forest management, product repair and reuse, and social economic customs, such as trade by barter. Regulations that allow and facilitate such activities would contribute to wellbeing and livelihoods while also reducing environmental impacts. Micro-SMEs are an important source of economic activity and employment in the region.<sup>10</sup> Such small-scale businesses are usually less competitive than larger and more industrial enterprises, which benefit from greater economies of scale. However, given the social value of micro-SMEs, it can be important for local



governments to support and protect them. Licensing for crafts and farmers markets in attractive city locations, setting up innovation centres, micro-credit schemes, etc., are examples of actions that could provide support across the region.

It should be emphasized that much of the population in the Asia-Pacific region is already living within ecologically sustainable limits. These are mainly communities in rural areas. Since urban living in general requires higher levels of consumption and is associated with higher environmental impacts, it is important to explore ways to limit further urbanisation. This requires providing incentives for people in rural areas to stay, including improved opportunities for education, health care, decent living standards, and secure livelihoods. As countries develop, there is a need to seek ways to protect low-impact lifestyles, and to enhance the wellbeing of people and communities in ways that are possible within the earth's environmental boundaries.

#### SUSTAINABLE CONSUMPTION AND PRODUCTION AND SDGS



**Figure 3: Sustainable Consumption and Production**

Several SDGs have targets involving measures to promote SCP besides just SDG 12, including under the water goal (SDG 6), target 6.4 on water use efficiency and target 6.5 on integrated water resource management, the energy goal's target 7.3 on energy efficiency, SDG 8's target 8.4 on resource efficiency and decoupling economic growth from environmental degradation, SDG 9's target 9.2 on sustainable industrialization and target 9.4 on resource use efficiency and clean production technologies. It is notable that a variety of other goals will be helped by enhanced sustainable consumption and production, including reduced poverty, greater food security, better



health, greater equality, as well as land, water, and air environments, and climate change. SDG 8 could also have been put in the category of SDGs helped by SCP, because SCP will make a major contribution to employment and decent work.



#### 4.4. SAFEGUARD ECOSYSTEM SERVICES AND BIODIVERSITY

Protecting ecosystems is of key importance for alleviating poverty. Current development patterns are harming the region's rich natural heritage and its great diversity in ecosystems and habitats (SCBD, 2014). Natural ecosystems perform various functions that are of great value to society, including regulating hydrological flows, purifying water, protecting human settlements against natural disasters, limiting climate change by storing carbon, and providing food. The integrity of natural ecosystems is especially important for indigenous groups and many rural communities, where households often depend on services and materials directly from nature for their livelihoods.

Many of the services provided by nature are currently taken for granted, and their value to society is insufficiently recognised in decisions by businesses and governments. As a result, many ecosystems of vital importance to local communities and of great value for society in general are gradually being degraded, damaged, or lost. Reversing these trends around would have many benefits.

Land use changes, mainly for agricultural expansion (including oil palm plantations) and infrastructure development, nitrogen deposition, climate change, and invasive species are among the key drivers of biodiversity loss in the Asia-Pacific region (Braimoh et al., 2010). Therefore, national and local strategies for land use can play an important role. To implement such strategies, both regulation and economic incentives may be needed.

Protected areas, such as national parks, exist in most countries in the region. They can be effective for protecting species and ecosystem functions, but to be fully effective, they need to be connected into larger networks with corridors that allow animal migration, such as in the Chitwan National Park in Nepal. Effective protection against logging, poaching, and other destructive practices is also necessary. When establishing new protected areas, or expanding existing ones, agreements with local communities may need to be worked out to allow for traditional uses that cause little harm.

There are good experiences of allowing local communities to look after and manage natural areas, for example in India, Nepal, Viet Nam, and the Philippines. Since the lifestyle of these communities depends directly on ecosystem functions, they have incentives to ensure that such functions are sustainably maintained. It is also possible to strengthen such incentives, for example by paying communities for the ecosystem



services provided by the land they are managing – payment for ecosystem services (PES). Promotion of eco-tourism can also provide incomes for communities and strengthen incentives for sustainable management. Community-based management typically requires that the government provides support to the communities involved, strengthening their capacity for sustainable use and management. Looking beyond protected areas, it is important to promote land use that allows certain economic activities while also protecting vital ecosystem functions. For example, this can involve low-impact agriculture, such as agroforestry.

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#### ECOSYSTEMS, BIODIVERSITY, AND SDGS

There are four SDGs which are directly related to protecting biodiversity and ecosystems. Target 2.5 narrowly focuses on the genetic diversity of seeds. SDGs 6 and 15, on water and land, call for the protection of a broad range of ecosystems, and SDG 14 calls for the protection of oceans. No SDG target mentions protecting biodiversity in general, but SDGs 6, 14, and 15 call for protecting a very broad range of ecosystems, and if these are effectively implemented, it would make a significant contribution to protecting biodiversity. Thus, SDGs 6, 14, and 15 can be considered as means to protect biodiversity. In turn, the actual, specific, means to protect ecosystems are mainly contained in various other SDGs, particularly the so-called “economic” ones. The key targets may be 8.4 on decoupling economic growth from environmental degradation, and various targets under Goal 9 which aim to make industrialization sustainable. These, in turn, would be implemented through the measures contained in the targets under SDG 12 on sustainable consumption and production. Of course, important contributions to protecting ecosystems would also be made by the sustainable transport (11.2) and pollution reduction targets (11.5. and 11.6.) under the cities goal (11), the promotion of renewable energy, energy efficiency (SDG 7), education for sustainable development (SDG 4), and peaceful societies (SDG 16).

SDGs on poverty reduction, health, and reduction of inequalities will receive a major boost from ecosystem protection. In addition, some aspects of the SDGs which contain measures to protect ecosystems would also see major benefits from enhanced ecosystem protection, which a) will create many decent jobs (SDG 8), b) may reduce conflict and foster more peaceful societies, c) will enhance the resilience of cities to natural disasters. The total value of ecosystem services globally has been estimated to be 125 trillion USD (Costanza et al., 2014).

A good example of a goal which includes its means as well as important effects is SDG 6 on water, which could be included in all three categories in the table. Sometimes ends and means are even included together in the same target. Target 6.6. on



protecting ecosystems is a major objective. The means to achieve it are included in target 6.3 (on reducing pollution, increasing wastewater treatment and recycling), target 6.4 (on increasing water use efficiency), and target 6.5. (on integrated water resources management). Then, the results of better ecosystem protection include target 6.1. (universal and equitable access to safe and affordable drinking water), target 6.3. (improving water quality), and target 6.4. (reduce water scarcity).

Finally, some missing elements become apparent in this kind of table showing chains of means and ends. The environmental media of land and water are highlighted in the SDGs, as is climate change, which relates to the air, but the air environment overall is less emphasized, included as part of the health and cities SDGs (SDG 3 and 11) (Elder & Zusman, 2016). Air is not really an ecosystem, but certainly reduction of air pollution would make a significant contribution to improving the health of land and water ecosystems. Likewise, as mentioned earlier, resilience was not highlighted as a headline goal, but ecosystem protection is a major pillar of strengthening resilience.

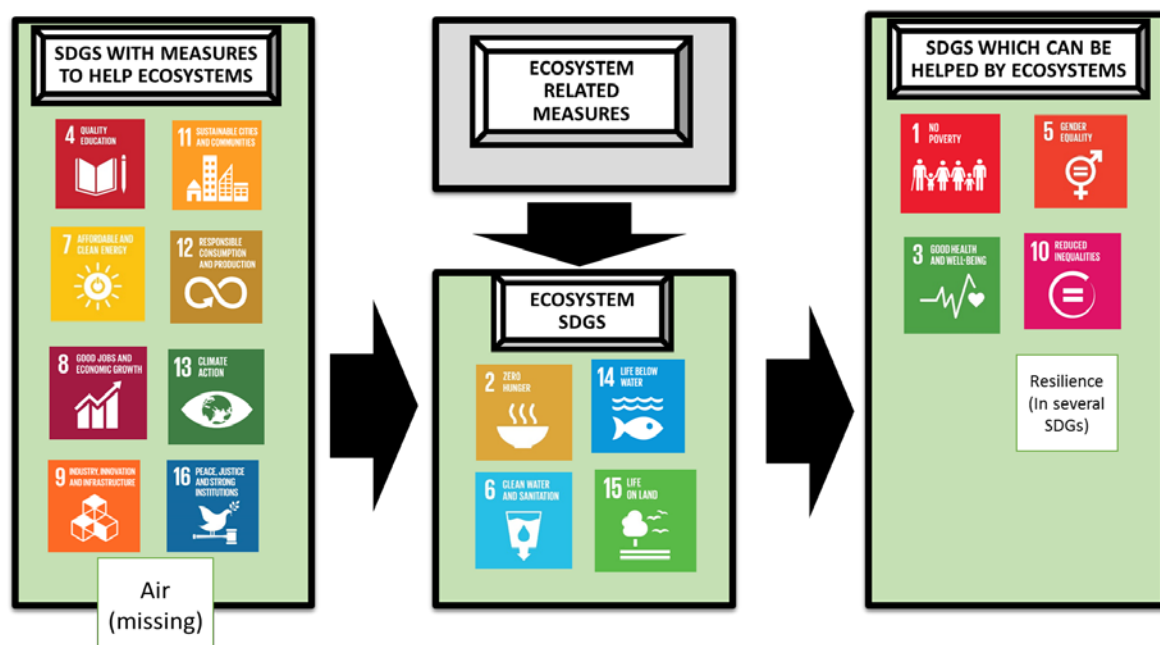


Figure 4: Biodiversity and Ecosystem Protection



## 4.5. POLLUTION PREVENTION AND CONTROL

Pollution of air, water, and soil has reached alarming levels in many places in the region and poses serious threats to human health and ecosystems. According to WHO estimates, in 2012, more than five million deaths in this region were attributable to air pollution, with indoor and outdoor air pollution causing approximately the same number of casualties (WHO, 2014b). Pollution is also having a significant negative impact on economic activities. For example, many countries are experiencing large losses in crops production as a result of pollution. Hazardous air pollution is causing some cities to restrict ordinary outdoor activities, especially for school age children, creating difficulties in attracting and keeping foreign investment and skilled foreign and domestic labour. The media has helped to increase public awareness of these serious challenges, especially pollution episodes in cities, and citizens in many countries are now demanding quick and effective actions by their governments. In rural areas in particular indoor air pollution caused by the burning of fuels for cooking and heating remains a severe health hazard that requires more attention.

For all types of pollution, the first step is to strengthen pollution standards and regulations, and the second step is to enforce them effectively. For example, WHO has established guidelines for a range of air pollutants, but many countries in the Asia-Pacific region have weaker standards (CAI-Asia, 2010; Elder, 2015). Surprisingly, no ASEAN country had fuel economy standards as of 2010 despite obvious cost savings and energy security benefits (50by50 & CAI-Asia, 2010). Developing countries may need capacity building assistance to strengthen standards, improve monitoring and reporting, and compliance and enforcement.

For reducing pollution, economic policies are also necessary. Energy and resource efficiency, renewable energy, and sustainable transport are keys for reducing pollution, especially air pollution. The 3Rs are key approaches for reducing waste and resource use, which in turn reduces pollution. Some countries in the region have broader economic policies or concepts with the potential to promote cleaner production such as (i) Green Growth in Korea (Statistics Korea, 2012); (ii) China's Circular Economy,<sup>11</sup> the concept of Green Development, and the Blue Sky Science and Technology Project,<sup>12</sup> and (iii) Japan's Sound Material Cycle Society.<sup>13</sup>

Cleaner production is a business strategy that can increase profits by reducing waste in the production process to cut costs or finding an economic use for the waste to generate revenue. Governments can provide regulatory advantages to companies with



cleaner production processes such as increasing the costs of waste collection and treatment. Subsidies for cleaner production innovations and favourable loans for cleaner production investments, especially for SMEs, can also be considered. Land use plans can consider the co-location of industries, so that waste from one is used as an input to the other. For cities, establishing effective systems for collection and treatment of sewage can help authorities achieve their objective of protecting residents' health. Decentralised sanitation systems and ecological treatment systems, where nutrients are returned to agriculture, turning a waste problem into a resource, can play important roles as complements to large-scale conventional wastewater treatment plants.

A co-benefits approach can reduce the costs of reducing pollution since different kinds of pollution often have common sources. The Climate and Clean Air Coalition and the Asian Co-benefits Partnership (Asian Co-benefits Partnership, 2016a) already promote specific measures to reduce short-lived climate pollutants (SLCPs) which are also important air pollutants (UNEP, 2011). The co-benefits approach can also be applied to other areas such as transport, waste, and buildings (Puppim De Oliveira et al., 2013).

Integrated land-water management strategies as well as improved governance and capacity building are necessary in order to reduce pollution of land and water resources while fostering sustainable development at the same time (Scheyvens et al., 2017). Governance strategies should include multi-stakeholder participation and community-based resource management as well as market-based strategies (UNEP, 2012). Reducing leakage of nutrients from agriculture requires awareness raising and capacity building of farming communities, and support for adopting improved farming techniques. Approaches that have potential for realising multiple benefits include low-input and organic farming, integrated agriculture using animal manure as fertilizer, non-till farming, agroforestry and permaculture.

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#### POLLUTION CONTROL AND SDGS

The major SDGs with pollution control targets are SDG 6 on water, SDG 14 on oceans, and SDG 15 on land, similar to the goals related to ecosystem protection. In addition, SDG 11 on cities also calls for pollution reduction. And the SDGs which provide the main means of reducing pollution are also similar to the ones which provide the means for ecosystem restoration, particularly the so-called "economic" SDGs. Again, the key targets may be target 8.4 on decoupling economic growth from environmental degradation, and various targets under SDG 9 which aim to make industrialization sustainable, as well as SDG 7 which includes renewable energy and energy conservation. These, in turn, would be implemented through the measures contained



in the targets under SDG 12 on Sustainable Consumption and Production. SDG 11 on cities also contains important means – sustainable transport (target 11.2.) – to help achieve its pollution reduction target (target 11.6.). SDG 4 (education) and SDG 16 (peaceful societies) may also contribute to pollution reduction.

Pollution control is also an important means to achieve the so-called “social” goals including poverty reduction (SDG 1), food security (SDG 2), health (SDG 3), and inequality (SDGs 5 and 10). Climate change (SDG 13) can be mitigated to some extent through reduced pollution, especially air pollution, although some air pollutants have cooling effects, so climate and air pollution should be managed together to maximize synergies and minimize trade-offs (Asian Co-benefits Partnership, 2016a).

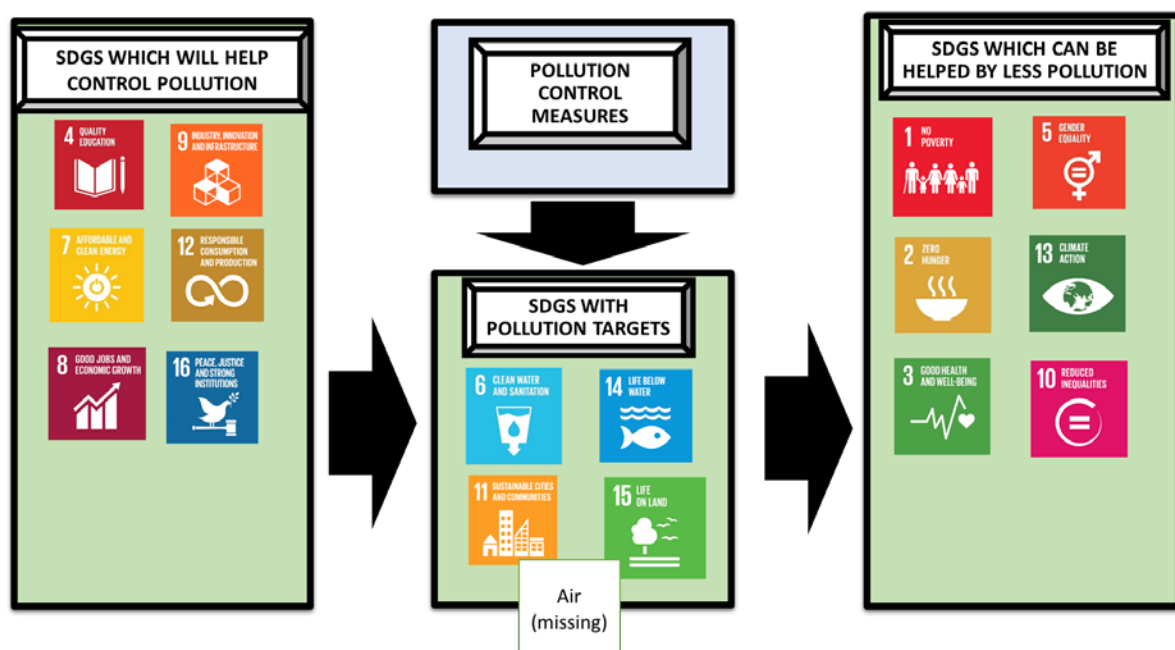


Figure 5: Air, Water, and Soil Pollution Control



## 4.6. ENSURE SOUND MANAGEMENT OF CHEMICALS AND WASTES.

In most of the Asia-Pacific region, inappropriate management of waste and chemicals is a serious threat to human health and ecosystems. Large and growing volumes of uncollected waste, waste dumping with little or no environmental protection, open waste burning, and release of untreated sewage to watercourses are part of the reality in many cities (UN-Habitat, 2010). At the same time, the generation of varieties of complex and hazardous waste that require special care and treatment, such as electronic waste, medical waste, and industrial waste is also on the rise. In addition, recycling – which has potential environmental benefits in many cases – is often carried out with primitive techniques and inadequate protection, causing pollution and exposing workers to hazards (Tsydenova & Bengtsson, 2011).

Technologies for dealing with these challenges are readily available. For example, biodegradable waste, by far the largest share of municipal solid waste, can be composted or used to produce biogas. Investments in such low-cost options can drastically improve sanitary conditions, reduce GHG emissions, save money for local governments as a result of the reduced need for transportation and disposal, and also generate green jobs. It is estimated that the amount of organic waste produced annually in the Asia-Pacific region has a potential economic value of more than USD 700 million, if used for either compost or biogas generation (ADB, 2011). Additionally, establishment of collection systems and safe treatment facilities for hazardous waste would have significant health benefits. Materials recycling, which is currently to a large extent done by the informal sector, can gradually be upgraded and formalised. Training of informal recycling workers may be needed in order to avoid unintended negative impacts on livelihoods. Policies based on the principle of extended producer responsibility can help to mobilise financial resources for such upgrading.

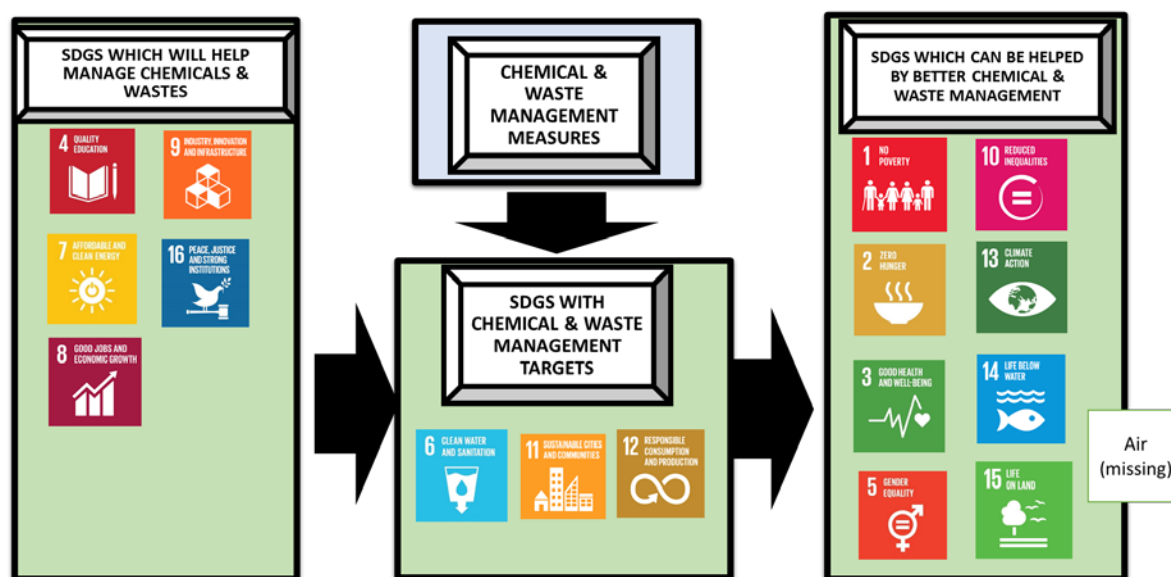
Product repair and reuse are common in most countries in the Asia-Pacific region. These practices can reduce both the demand for natural resources and the generation of waste, and they also offer livelihood opportunities. However, as countries go through the process of modernisation, these practices tend to lose ground. There are strong reasons to support these sectors to protect the valuable functions they perform to rationalise society's use of materials. While beyond this region, an example of policy supporting a trend towards product repair and re-use comes from Sweden. The government submitted a proposal to parliament suggesting that products that receive a repair should only be taxed with 12 percent Value added Tax (VAT) instead of the



usual 25 percent. Such clear fiscal policy in support of sustainable consumption exemplifies how governments can steer consumption patterns in society. In Sweden, refrigerators, bicycles, and other common household items will now be repaired rather than thrown away (Orange, 2016).

Similarly, agricultural and industrial chemicals are increasingly used in the region (UNEP, 2012). Many of these substances have known or suspected hazardous properties, and for most of them there is insufficient information available to properly assess hazards and risk. The monitoring systems for how chemical substances are dispersed, transformed or accumulated are under-developed and provide insufficient information for safe management. Ensuring safer management of chemicals requires a range of government interventions, including for example: (i) stricter requirements for corporations to conduct testing and to disclose information; (ii) expanded bans of especially problematic substances; (iii) proper inspections and enforcement of regulations; (iv) education and awareness raising among key stakeholders, such as farmers and workers in chemicals-intensive industries; (v) promotion of effective substitutes, such as biological pest control methods; and (vi) expanded monitoring systems for tracking the environmental fate and impacts of chemical substances.

#### CHEMICALS, WASTES, AND SDGS



**Figure 6: Sound Management of Chemicals and Waste**

Sound management of chemicals is the focus of target 12.4, while waste management and sanitation are included in SDG 6 on water and SDG 11 on cities. The SDGs which provide the means for chemicals management are similar to those for protection of



ecosystems and pollution control, particularly SDGs 7, 8, and 9. The goals which are helped by improved management of chemicals are also similar, especially the social goals of poverty reduction, improved food security, improved health, and reduced inequality. Of course, improved chemicals management also is a major factor helping to conserve land and water ecosystems.



#### 4.7. STRENGTHEN SCIENTIFIC UNDERSTANDING OF ENVIRONMENTAL PROBLEMS AND LINKS WITH SUSTAINABLE DEVELOPMENT POLICIES

The need to strengthen scientific understanding of environmental problems is not new. Environmental issues, and their linkages with sustainable development, are very complex. Scientific knowledge is needed to understand and effectively address environmental problems and create synergies with human development. Certainly natural science research is necessary, but contributions from the social sciences and humanities are also necessary, since a transition to sustainability needs changes in behavior, social norms, and institutions.

The region needs better data generation systems and capacity for environmental monitoring and data analysis. Regional efforts are also needed, not just at the national and sub-national levels, since many environmental problems are trans-national. Regional and national and regional efforts need to be well-coordinated in order to be effective.

Business and government leaders should understand the interlinkages between the environment and development, and how they affect each other. Decision makers need the latest scientific knowledge; they also should learn how to communicate what they want to know from the research community. Therefore, institutional arrangements to link decision makers, including political as well as administrative officials, with the research community, should be enhanced.

Several global scientific advisory panels have been established to synthesize the state of scientific knowledge and suggest possible solutions and policy responses in various areas. These include the Intergovernmental Panel on Climate Change (IPCC), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and the International Resource Panel (IRP), and the Global Environmental Outlook (GEO). The results and suggestions of these assessments should be more effectively and persuasively communicated to all levels of government, key stakeholders, and the general public.

For SDGs, some efforts have been made to incorporate scientific input to the High Level Political Forum. There is also a plan to develop a global report on the progress of sustainable development with scientific input similar to other global scientific assessments. While a global report is certainly important, it will be necessary to mobilize scientific input on a much larger scale to fully implement the SDGs. The



Sustainable Development Solutions Network (SDSN) has been created in order to promote the engagement of the research community in SDG implementation, although this kind of effort needs greater support in order to scale up. One major challenge of the SDGs that needs scientific support is the complexity of the interlinkages among the SDGs, with major opportunities for synergies as well as potential trade-offs (Elder et al., 2016; Nilsson, Griggs, & Visback, 2016; Zhou & Moinuddin, 2017). The scientific community has traditionally worked mainly in academic silos, similar to the traditional sector silos of the policy world.

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#### ENVIRONMENT-RELATED SCIENCE AND SDGS

Basic science, particularly for the environment, is not highlighted well in the SDGs themselves, in contrast to technology, which is strongly mentioned in several SDGs (e.g. targets 3.b., 5.b., 9.a.) and has its own section in SDG 17 on the means of implementation (targets 17.6-17.8.). The main one related to environmental science is target 14.a. which calls for increased scientific knowledge about oceans. However, there are no targets on research relating to land ecosystems, air pollution, or climate change. Moreover, there are no targets on health impacts of pollution or other environmental factors such as climate change. Target 9.5, if interpreted literally, could include basic science (it states “enhance scientific research,” not specifying what kind of research, so it could be interpreted to include environment-related research), but it is under SDG 9 which focuses on infrastructure and industrialization, and the rest of the target discusses “research and development” as well as industrial technology. Target 7.a. is on clean energy research and technology.



## 5. STRENGTHENING GOVERNANCE AND INSTITUTIONS FOR EFFECTIVE IMPLEMENTATION

The solution areas identified in the previous section require decisive government action for them to be implemented. The old development paradigm, which held that environmental protection is too expensive for developing countries, that environmental destruction is an unfortunate but unavoidable consequence of poverty alleviation, and that a country can grow its economy first and clean up its environment later, is now threatening future prosperity. Thus, a new way of thinking about environment and development needs to be shared widely, across government ministries as well as among political leaders, in the private sector, and in society more broadly. This new thinking can take inspiration from the early-phase innovative examples being implemented in some countries of the region. Governments also need to organise themselves differently, not only to address the negative consequences of the old development model but also to adopt an integrated approach to harness the synergies between ecosystem protection and the other elements of sustainable development. UNRISD (2016) notes “the 2030 Agenda for Sustainable Development can only be realized if the implementation process leads to transformative change addressing the root causes of inequitable and unsustainable outcomes. Transformative change therefore requires fundamental changes in social relations and institutions to make them more inclusive and equitable, as well as the redistribution of power and economic resources.” Some important aspects of such institutional reforms are highlighted below.



## 5.1. DEVELOP RELEVANT CAPACITY TO MEET EXISTING COMMITMENTS

All countries in the region already have environment-related legislation, and they have all signed multilateral environmental agreements with other countries, under regional frameworks or the United Nations. The first priority is to ensure fulfilment of such environmental commitments and enforcement of existing laws and regulations. For this, there are a number of environment-related functions that most countries should generally be able to manage, such as:

- Assessment, monitoring and data
- Policies, laws, regulations, standards, economic instruments
- Inspections and issuance of licences, and compliance enforcement
- Judiciary system capable of investigating and prosecuting violations of environmental laws and regulations
- Environmental impact assessment (EIA) of projects, and strategic environmental assessment (SEA) of sectoral and cross-cutting policies, plans and programmes
- Capacity-building, promotion of formal and non-formal education
- Public awareness, outreach, advocacy, promotion of CSR to encourage behavioural change
- Networking and partnerships with civil society
- Coordination of environment-related issues within the government
- International environmental cooperation (MEAs, multilateral and bilateral cooperation, technology transfer, etc.)
- Research

Assessment of government mandates and capacities to carry out these functions is needed. In countries where the above functions are weak or missing entirely, they need to be developed, along with the required human and financial resources. In some cases, more staff is urgently needed (quantity), and in many cases the existing staff do not have sufficient capabilities (quality). Adequate capacity is needed at all levels of government, not least at local levels where much of implementation takes place. Strengthening the capacity to mainstream environmental concerns into development planning and policies is necessary.

However, while strengthening such capacities is essential for shifting to more sustainable development paths, it is important to consider also other factors that may hamper reform efforts. Weak capacity is not always the most critical factor. Flawed incentive structures can be in conflict with the need to reflect environmental concerns



in planning, policy-making and implementation. Transformative policies cannot be imposed from the top, but governments can create the incentives and enabling environment to encourage policy-experimentation and learning, so that creative destruction or destructive creation can find receptive space.

One example of such potentially influential incentive structures is the systems used for performance evaluation and promotion of civil servants. If such systems do not reflect environmental aspects but focus on short-term economic outcomes, they can encourage a continuation of unsustainable development patterns.



## 5.2. MAINSTREAM SUSTAINABILITY INTO ALL POLICY AREAS AND MOBILISE STAKEHOLDERS

The SDGs are a broad and challenging agenda, aiming explicitly at transformation and requiring a new approach to development. The launch of this high-profile global agenda provides an opportunity for governments to reconsider their ways of working, their routines for planning and target setting, resource allocation, policy development, implementation, and monitoring. The new development agenda to 2030 is broad and challenging. Much stronger coordination between economic and policy sectors will be necessary to implement the SDGs, since they are all interlinked. Environment ministries have been often perceived as mainly responsible for sustainable development, while development ministries were perceived as mainly responsible for MDGs. In contrast, a whole-government approach is needed for SDGs. Full involvement of ministries or departments with a mandate for overall coordination, such as finance and planning ministries, is essential. Development planning should be guided by the idea that environmental protection is an essential precondition for human well-being, including poverty elimination, and long-term prosperity.

However, governments cannot implement the SDGs by themselves. Mobilization of whole societies is necessary, particularly major stakeholders. The MDGs and SDGs are very different in this aspect. The SDGs are universal and apply to all countries and all people, while MDGs basically focused on poor people and could be implemented by sectoral experts. Involving entire societies requires more participatory and collaborative governance, much better access to information, and greater accountability and transparency in policy and decision making.

The SDGs can be used as a tool to help to mainstream sustainability considerations into all policy areas. The SDGs are all interlinked, as illustrated above, and therefore their implementation will require substantial coordination between many parts of government. Moreover, the SDGs can also be used to mobilize and coordinate various stakeholders to implement the SDGs.



### 5.3. DEVELOP RESPONSIVE INSTITUTIONAL ARRANGEMENTS TO ACCOMMODATE THE NEW PARADIGM

Achieving the SDGs, as part of national development objectives, will need engagement of all levels of government, beyond just environment ministries and agencies. In the VNRs to date, “all countries reported progress in establishing and/or strengthening existing institutional frameworks, inter-ministerial coordinating offices, committees, or commissions” (UNDESA, 2017). With environmental concerns often seen as a threat to national development strategies and economic growth plans, the present institutional arrangements tend to constrain the role of environment ministries. Governments should revise their institutional arrangements in alignment with the new integrative understanding of alternative development pathways, and that would better enable environment ministries to harness the SDGs framework in support of national objectives. This can include renaming environment ministries to a more suitable reflection of their elevated coordinating function, increasing their capacities to reflect their expanded responsibilities and workload, and repositioning them within the government with higher authority to ensure critical environmental concerns are appropriately reflected in other policy areas in an integrated manner. Three examples below from Asia-Pacific provide early lessons:

- Mongolia created one ministry combining both environment and green development– the Ministry of Environment and Green Development. This ministry was given a coordinating function, together with the Ministry of Finance. The ministry also chaired a permanent coordination committee. This structure has since been reorganized and renamed, but it is still a useful example.
- Sri Lanka placed the responsibility for coordinating the SDGs directly under the President, who is the Chair of the National Council for Sustainable Development (UNEP, 2012).
- Bhutan established cross-cutting indicators spanning all government agencies in charge of planning and development. These indicators direct their work. The Constitution directs the State “to promote those conditions that will enable the pursuit of Gross National Happiness,” ensuring that improving the GNH index is the basis for decision making by all government agencies (UNEP, 2012).



In addition to establishing appropriate mandates and institutional arrangements for mainstreaming suitability across governments, it is also important to consider other institutional reforms. One area of particular significance is the judicial system, which can help achieving a fairer balancing of conflicting interests, including in relation to environmental controversies. Courts that are independent from the government, that work on a sound legal basis, and that are appropriately resourced can help safeguard against short-sighted decisions. In recent years, green courts have played important roles in many countries as arenas for citizens and communities to take action against severe environmental pollution and urge reforms in government policies. An interesting example in Asia is the Indian National Green Tribunal, which was established to handle cases related to the environment. One of the Green Tribunal's legal foundations is in India's constitution, which ensures the right of all citizens to a healthy environment. Strengthening judiciary institutions and equipping them with the legal tools and capacity needed to enable all citizens to defend their right to a healthy environment is an important element of new development model for the Asia-Pacific region. India has also developed important legislation and institutional arrangements to guarantee access to information.



## 5.4. ADOPT NEW MEASURES OF MEASURING PROGRESS THAT REFLECT SOCIAL AND ENVIRONMENTAL HEALTH

GDP should be replaced as the core indicator of national development. There are a variety of problems in its treatment of the environment (World Bank, 2010). Overall, it does not lead to the achievement of human well-being and prosperity within planetary boundaries, so it is not suitable for tracking overall progress on SDGs. China's Green GDP project is one example illustrating the gap between GDP and human well-being.

Bhutan has actually moved away from using GDP as a scorecard for development. Instead, it developed a new system called Gross National Happiness (GNH) that incorporates social and environmental dimensions of sustainability. Bhutan's GNH has four key strategies, called pillars: sustainable and equitable socioeconomic development, environmental conservation, preservation and promotion of culture, and good governance. GNH uses 33 indicators, both quantitative and qualitative, in nine different clusters, highlighting various factors that influence well-being.

Other alternatives to GDP include the Genuine Progress Indicator,<sup>14</sup> the Human Development Index,<sup>15</sup> and the Human Wellbeing Index<sup>16</sup> (McLean, 2017). The Human Development Index uses a comparative measure of life expectancy, standards of living, education, and literacy. The Gini Coefficient and the Palma ratio measure income inequality. The Ecological Footprint and various resource consumption indicators capture the environmental and resource effects of consumption as well as potential future resources. Natural capital indices assess endowments of natural resources.



## 5.5. ALIGN NATIONAL TAXATION AND BUDGETING, AND THE BROADER FINANCIAL SYSTEM WITH SUSTAINABLE DEVELOPMENT OBJECTIVES

The UNEP Inquiry into the Design of a Sustainable Financial System has identified potential options in the Asia-Pacific region to promote a more sustainable financial system (<http://unepinquiry.org/>). Ministries of Environment can potentially play an advocacy and advisory role in partnership with Central Banks, Ministries of Finance, National Planning Commissions, other ministries, and the private sector to achieve the following reforms:

- i. *Sustainable public procurement* (SPP) programmes are a well-known approach to aligning government budgets with sustainable development objectives. Many countries in the region already have or are now developing related basic policies. While SPP can boost the competitive advantage of more sustainable products and services, it does not necessarily require structural changes in government procedures.
- ii. *Sustainable banking*: 'green credit' risk management and reporting requirements are an important way to enhance the environmental sustainability of the banking sector. Indonesia, China, and Bangladesh have launched related initiatives demonstrating their feasibility to provide green financial incentives. These initiatives considered various capital weights to reflect mispriced environmental risks and broader policy objectives.
- iii. *Green bonds*: this region can be a leader in green bonds. Already, bond markets have been developing rapidly. The proceeds from green bonds could be used to fund green infrastructure and green business.
- iv. *Stock exchanges*: listed companies are now required to provide information about social and environmental corporate responsibility by the stock exchanges of some countries like Singapore, Thailand, and others.
- v. *Green budget tax reform* allows governments to influence market prices through public policy and internalise the costs of environmental degradation. This can be done either directly, through the national accounts, or indirectly, through fiscal policy (ESCAP, 2005). One way to internalise environmental costs is to shift the tax base from penalising economic "goods" (e.g. income earned or jobs created) to penalising "bads" (e.g. pollution and virgin resource extraction). This could pay a double dividend, simultaneously supporting economic development and reducing impact on the environment.



- vi. *Participatory budgeting.* Especially at the local level, involving citizens in the budgeting process can help ensure that spending priorities are aligned with locally recognised needs. Experience from Brazil has shown that cities that involve citizens in the budgeting process have achieved better development outcomes than comparable cities with conventional budget routines (Gonçalves, 2014). At the national level, increased transparency around budget allocations and the rationales behind priority setting can enhance accountability.
- vii. *Fossil fuel subsidy reduction/elimination.* Substantial funding could be raised by eliminating these subsidies and shifting them to more sustainable uses (Merrill & Chung, 2014). Fossil-fuel subsidies for consumers across emerging and developing Asia totalled US\$104 billion in 2011 (IISD, 2014). Subsidies often introduce economic, environmental and social distortions with unintended consequences. They are expensive for governments and may not achieve their objectives, while also inducing harmful environmental and social outcomes. For example, fuel tax rebates and low energy prices can encourage overuse of fossil fuels and increase greenhouse gas emissions. Agricultural subsidies can lead to the overuse of pesticides and fertilizers with harmful consequences for natural resources and human health (OECD, 2007). The government of Indonesia has already started to reduce its energy subsidies. Consumer energy subsidies alone have amounted to around a 3.1 per cent of Indonesia's GDP since fiscal year 2010 (IISD, 2014). The subsidies were intended to help the poor, but mainly they benefit those with higher incomes.
- viii. *Mainstreaming environment into national budgets.* Climate change and environment should be mainstreamed into national budgets during the budgeting process. Spending could be reallocated to support environmental and climate policies. Mainstreaming would also help to identify and take advantage of co-benefits between environmental spending and other areas. One method of mainstreaming is sustainable public procurement. Indonesia's Ministry of Finance has introduced carbon emissions tagging systems in the national budget, and Nepal has included climate related expenditures into its national budget code. Nepal also introduced Climate Public Expenditure and Institutional Reviews (CPEIRs) of environment related expenditures and institutional arrangements.

Some governments may also have concerns about the costs of implementing the SDGs, which have been estimated to be about USD 2-3 trillion per year (Schmidt-Traub,



2015). This may sound expensive, especially in the context of the Addis Ababa Action Agenda (AAAA) which emphasizes the importance of financing by national governments and the private sector. However, this sounds more feasible if it is put in the overall context of global GDP, savings, and financial assets (USD 78, 17, and 278 trillion, respectively, in 2014). Moreover, in terms of infrastructure investment, much of it involves not special investment just for SDGs, but rather making already planned investments more sustainable. Finally, it is important to note the positive synergies and interlinkages between SDGs will lead to large cost synergies. For example, investments to reduce pollution, shift to renewable energy, and enhance energy efficiency will improve health and reduce health costs. Progress on one SDG in many cases also helps other SDGs. (Elder et al., 2016)



## 6. CONCLUSIONS

Key themes of this report are, a) the need to stay focused on the big picture and think hard about how to achieve real transformation, b) the need to avoid becoming overwhelmed by the complexity of SDGs, and c) the need to avoid getting too side tracked by the exercise of developing ever narrower and disaggregated data and indicators. To be sure, the work on indicators and data is very important, especially for monitoring and review. However, this is a very long-term effort, while the problems and challenges of environment and development in the Asia-Pacific region are large scale and quite urgent. Therefore, it is important not to put all of the effort into developing and collecting data without actually working on the problems. A lot is already known about many of these problems even though the data may be not very well developed. Many countries and officials are quite concerned about the complexity of the SDGs and its many targets and indicators. This report tries to help to step aside from this complexity.

This report recommends a number of overall directions and broad-focused policies that can be used to support a variety of goals simultaneously. To be sure, this report does not argue that detailed and focused policies should not be adopted for individual indicators. However, it is important to make sure that this does not preclude the development of broader, more comprehensive and transformative policies, especially ones which may help to promote sustainable development in a more integrated manner.

At the global level, the crucial contribution of the environment to economic prosperity and social well-being is increasingly recognised, but it is not necessarily fully understood or accepted yet, especially at the national and local levels. This report highlights several key areas where traditional economic development is undermining the environmental basis for human well-being, including vulnerability to climate change and its costs; food, energy, and water insecurity; unsustainable production and consumption; and deteriorating health and rising costs from air and other pollution. Moreover, resource scarcity resulting from environmental degradation and unsustainable consumption and production is also generating traditional security concerns.

To move forward, broader and more comprehensive policies are needed to promote low carbon societies, sustainable consumption and production, resilience, biodiversity



conservation, and ecosystem services. The energy transformation needed for low carbon development and measures to promote sustainable consumption and production are core policy directions to bring about economic transformation. This will simultaneously promote economic prosperity as well as support the earth's capacity to support human society. In addition, stronger policies are needed to control and prevent pollution of air, water, and soil, especially the sound management of chemicals and waste. This needs to be supported by improved scientific understanding.

Strengthening governance and institutions is also necessary for effective implementation of the SDGs. Basic governmental capacity may be the first priority in many cases. It is also important to use the SDGs to mainstream sustainability into all relevant policy areas and mobilize the support of stakeholders. New institutional arrangements to coordinate an integrated approach to SDGs are probably necessary in many countries. This should be supported by new measures of progress, going beyond GDP. Finally, national tax and budgeting systems should be aligned with sustainable development objectives and SDGs. These broad measures and directions will help to keep the focus on transformation, without needing to set separate policies for each indicator.

Now should be the ideal time for the countries in the Asia-Pacific region to shift to more transformative sustainable development policies. Huge infrastructure investments are expected in the region in the next 2 or 3 decades, and it will be much more cost effective to make sure these investments are made in sustainable infrastructure rather than unsustainable infrastructure. This will enable the countries in the region to leapfrog over the dirty stage of development experienced by the existing developed countries, thereby minimizing the environmental costs associated with traditional development while accelerating the benefits of clean development. Otherwise, the region risks not only suffering from the costs of traditional development, but also of exceeding the planet's capacity to support human well-being.



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## ENDNOTES

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<sup>1</sup> The original document can be accessed at:

<https://sustainabledevelopment.un.org/outcomedocuments/agenda21>.

<sup>2</sup> The original document can be accessed at: <http://www.un.org/millenniumgoals/>.

<sup>3</sup> This idea is developed at: <http://www.stockholmresilience.org/research/planetary-boundaries/planetary-boundaries/about-the-research/the-nine-planetary-boundaries.html>.

<sup>4</sup>

[http://www.un.org/en/development/desa/population/publications/pdf/urbanization/the\\_worlds\\_cities\\_in\\_2016\\_data\\_booklet.pdf](http://www.un.org/en/development/desa/population/publications/pdf/urbanization/the_worlds_cities_in_2016_data_booklet.pdf)

<sup>5</sup> <https://sustainabledevelopment.un.org/vnrs/>

<sup>6</sup> <https://sustainabledevelopment.un.org/content/documents/15826Bangladesh.pdf>

<sup>7</sup> For example, see: [http://unfccc.int/adaptation/workstreams/national\\_adaptation\\_plans/items/6057.php](http://unfccc.int/adaptation/workstreams/national_adaptation_plans/items/6057.php).

<sup>8</sup> NDCs are available at: [http://unfccc.int/focus/ndc\\_registry/items/9433.php](http://unfccc.int/focus/ndc_registry/items/9433.php).

<sup>9</sup> The Plan is available at: <http://ourenergyplan.sa.gov.au/virtual-power-plant>.

<sup>10</sup> <https://asia.nikkei.com/Features/FT-Confidential-Research/Informal-jobs-sector-both-a-blessing-and-curse-in-Southeast-Asia>

<sup>11</sup> Available at: <https://ppp.worldbank.org/public-private-partnership/library/china-circular-economy-promotion-law>.

<sup>12</sup> A summary is available at: <http://www.china-un.org/eng/chinaandun/economicdevelopment/kj/t1009102.htm>.

<sup>13</sup> A summary is available at: [http://nett21.gec.jp/ECotowns/data/et\\_c-02.html](http://nett21.gec.jp/ECotowns/data/et_c-02.html).

<sup>14</sup> See: [http://rprogress.org/sustainability\\_indicators/genuine\\_progress\\_indicator.htm](http://rprogress.org/sustainability_indicators/genuine_progress_indicator.htm).

<sup>15</sup> See: <http://hdr.undp.org/en/content/human-development-index-hdi>.

<sup>16</sup> See: <http://measuring-progress.eu/human-wellbeing-index>.