

# TRANSFORMATIONS FOR SUSTAINABLE DEVELOPMENT

PROMOTING ENVIRONMENTAL SUSTAINABILITY  
in Asia and the Pacific



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Transformations for Sustainable Development:  
Promoting Environmental Sustainability  
in Asia and the Pacific

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#### **About the cover**

The hourglass represents the tight time frame within which the 2030 Agenda for Sustainable Development has to be implemented and the work to be done to “translate promises on paper into change on the ground,” as United Nations Secretary-General Ban Ki-moon has said.

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## FOREWORD

At the end of 2015, world leaders adopted an ambitious global development framework: the 2030 Agenda for Sustainable Development. There has never been a more urgent need for a concerted, integrated and aspirational compact for sustainable development. At the same time as negotiations for the 2030 Agenda were in full swing, in mid-2015, the global concentration of carbon dioxide in the atmosphere breached the 400 parts per million milestone—a critical red line for climate stabilization—for the first time in recorded history. Planetary health is literally at stake, which could undermine many of the human development achievements of the past decades.

The Asia-Pacific region's contribution to breaching this limit has been significant, with a doubling of regional CO<sub>2</sub> emissions between 1990 and 2012. While the use of resources, such as minerals, metals and biomass, has tripled since 1990, access to these resources has simultaneously become more unequal. Income gaps have widened. Nearly three out of four people in the Asia-Pacific region live in countries in which income inequality has increased or remained unchanged over the past 15 years. The share of income received by the poorest has also shrunk. Coupled with persistent social inequalities and policy failures, this has resulted in shortcomings in access to food, water and energy.

The region's success in meeting the Sustainable Development Goals will depend on whether regional megatrends, such as urbanization, economic integration, rising incomes and changing consumption patterns, are aligned with sustainable development outcomes.

This report examines transformations in four areas: investment flows, social justice, economic structure and patterns of resource use. These areas of transformation are fundamental to reframing the relationships between the economy, nature and people so that stakeholders in each of these dimensions of sustainable development work together rather than at cross-purposes. This is critical for a shift to more sustainable paths.

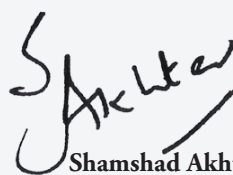
The challenge of delivering the 2030 Agenda is formidable, but there is also immense potential to achieve the necessary transformations. There are now more opportunities than ever to effect lasting and significant change.

The challenge for governments is to initiate and sustain transformation—defining policy, regulatory and institutional changes that enable new and effective alliances of stakeholders whose purposes and interests converge through values that support a sustainable future.

We recognize that the priorities for implementing the 2030 Agenda will differ from country to country. This is why our report focuses on the fundamental transformations required and the capacities of governments to support them, regardless of sustainable development priorities or social and political conditions. It also emphasizes the transformations that will strengthen the environmental dimension of sustainable development.

Multidisciplinary thinking on transformation is best delivered through institutional partnerships, which is why we are pleased to present this report as the outcome of a new partnership arrangement.

The Economic and Social Commission for Asia and the Pacific and the United Nations Environment Programme have traditionally collaborated in producing several editions in this report series since 1985 (formerly known as the State of the Environment in Asia and the Pacific). The addition of the United Nations University and the Institute for Global Environmental Strategies strengthens this partnership to bring even more policy-relevant reflections to national policymaking and regional cooperation.



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## ABOUT THE REPORT

Asia and the Pacific is a dynamic region. Regional megatrends, such as urbanization, economic and trade integration and rising incomes and changing consumption patterns, are transforming its societies and economies while multiplying the environmental challenges.

These environmental challenges range from growing greenhouse gas emissions, poor air quality, land use change, pressure on marine ecosystems, biodiversity loss and increasing demand for resources, such as energy and water. These megatrends are already shaping the future patterns of resource use and defining who benefits the most and who loses. A basic premise of the 2030 Agenda for Sustainable Development is that trade-offs between environmental protection, shared prosperity and social progress can no longer be viewed as acceptable.

Aligning these trends with sustainable development requires political will and action to reshape the relationships between the economy, society and the environment. This report examines four critical determinants of the relationships between these three dimensions of sustainable development as targets for fundamental transformations—in social justice, resource efficiency, investment flows and economic structures.



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## ABBREVIATIONS AND ACRONYMS

<b>ADB</b>	Asian Development Bank
<b>APEC</b>	Asia-Pacific Economic Cooperation
<b>APFSD</b>	Asia-Pacific Forum on Sustainable Development
<b>ASEAN</b>	Association of Southeast Asian Nations
<b>CO<sub>2</sub></b>	carbon dioxide
<b>CO<sub>2</sub>e</b>	carbon dioxide equivalent
<b>EPSM</b>	Environmental Protection Society Malaysia
<b>ESCAP</b>	Economic and Social Commission of Asia and the Pacific
<b>ETS</b>	emissions trading scheme
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FDI</b>	foreign direct investment
<b>GDP</b>	gross domestic product
<b>GJ</b>	gigajoule
<b>IEA</b>	International Energy Agency
<b>IGES</b>	International Global Environmental Strategies
<b>IMF</b>	International Monetary Fund
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IUCN</b>	International Union for Conservation of Nature
<b>kWh</b>	kilowatt hours
<b>MDGs</b>	Millennium Development Goals
<b>NO<sub>x</sub></b>	nitrogen dioxide
<b>ODA</b>	official development assistance

**OECD** Organisation for Economic Co-operation and Development

**OJK** Otoritas Jasa Keuangan (Indonesia)

**PES** payment for ecosystem services

**PM** particulate matter

**PJ** petajoule

**Rio+20** United Nations Conference on Sustainable Development

**SDGs** Sustainable Development Goals

**SLiM** Sustainable Living Initiative in Malaysia

**SO<sub>2</sub>** sulphur dioxide

**TMG** Tokyo Metropolitan Government

**UNEP** United Nations Environment Programme

**UNU** United Nations University

**WHO** World Health Organization

**10YFP** Ten Year Framework of Programmes



## EXPLANATORY NOTES

The Asia-Pacific region, unless otherwise specified, refers to the group of ESCAP members and associate members that are within the Asia and the Pacific geographic region (ESCAP and UNEP, partners in this publication, have differing regional compositions). Subregions in this report are also defined by the ESCAP division of countries, unless otherwise specified, as follows.

East and North-East Asia: China, Democratic People's Republic of Korea, Japan, Mongolia and the Republic of Korea.

North and Central Asia: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Turkmenistan and Uzbekistan.

South and South-West Asia: Afghanistan, Bangladesh, Bhutan, India, Islamic Republic of Iran, Maldives, Nepal, Pakistan, Sri Lanka and Turkey.

South-East Asia: Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Viet Nam.

Pacific: American Samoa, Australia, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Micronesia (Federated States of), Nauru, New Caledonia, New Zealand, Niue, Northern Marina Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

Developing ESCAP region: ESCAP region, excluding Australia, Japan, New Zealand and North and Central Asian economies.

Developed ESCAP region: Australia, Japan and New Zealand.

Least developed countries: Afghanistan, Bangladesh, Bhutan, Cambodia, Kiribati, Lao People's Democratic Republic, Myanmar, Nepal, Solomon Islands, Timor-Leste, Tuvalu and Vanuatu. Samoa was part of the group of least developed countries prior to its graduation in 2014.

Landlocked developing countries: Afghanistan, Armenia, Azerbaijan, Bhutan, Kazakhstan, Kyrgyzstan, Lao People's Democratic Republic, Mongolia, Nepal, Tajikistan, Turkmenistan and Uzbekistan.



Small island developing states: Cook Islands, Fiji, Kiribati, Maldives, Marshall Islands, Micronesia (Federated States of), Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor-Leste, Tonga, Tuvalu and Vanuatu.

Pacific island developing economies: Pacific countries, excluding Australia and New Zealand.

## SYMBOLS

References to dollars (\$) are to United States dollars, unless otherwise stated.

The dash (–) between dates signifies the full period involved, including the beginning and end years.

Percentages (%) do not necessarily add to totals because of rounding.



## EXECUTIVE SUMMARY

The 2030 Agenda for Sustainable Development is an aspirational call for action with a short time frame for delivery. In the lead up to its adoption, “transformation” became a buzzword, with much talk about transformation for sustainable development and how it would require additional finance, technology and greater capacity. But what does that mean in practice?

This report takes a step towards explaining that needed transformation. It proposes reframing and re-prioritizing the relationships between the economy, the society and nature through transformations in four areas—social justice, investment flows, economic structure and resource use.

These transformations will be fundamental to shaping the regional megatrends that are already defining the future of the Asia-Pacific region. They will determine what environmental pressures will be further created and the scale of those pressures, as well as who and how many people will be affected. In this new agenda, urbanization, economic and trade integration, rising incomes and changing consumption patterns must deliver, rather than undermine, sustainable development.

This report focuses on environmental sustainability in Asia and the Pacific. It examines the four areas for transformation through an environmental lens, highlighting policy and practical initiatives that hold transformative potential while recognizing the important links with the social and economic dimensions.

## FOSTERING TRANSFORMATION

**The urgency of the transformations needed cannot be overstated.** While the benefits of past transformations, such as the green revolution or the industrial revolution, took decades to emerge, the transformation to sustainable development has a much tighter time frame, given the threats posed by climate change and other aspects of environmental change, increasing competition for resources and intensifying consumption pressures.

**Top-down actions by government must foster the scaled expansion of bottom-up innovations and alliances between stakeholders.** Government action in reforming structural framework policies and conditions, underpinned by shared values and a broad societal consensus that change needs to occur, is a decisive driving force in transformations for sustainable development.

**The role of the State is to support the creation, clustering and scaling up of good practices or “niches” for transformation.** Changes in policy and institutional frameworks must recognize and reshape incentives, harness stakeholder values and provide direct support for innovation to scale up and nurture niches—areas for sustainability innovations, such as renewable energy, organic agriculture, green buildings and investments that support sustainability. Transformational policies will proactively align the interests of diverse stakeholders.

**We must pay attention to creating the conditions that enable change on a wide scale by changing mindsets and behaviours.** Among these conditions is the recognition of environmental limits in policy at different levels. There is evidence from the region where environmental limits are already shaping policy: There are greenhouse gas emission caps at the city level, constitutionally mandated forest cover targets and greenhouse gas intensity and renewable energy targets. A strong science-policy interface will have an important role in making these initiatives effective.

**The potential of technology to facilitate transformations should be actively harnessed by science, technology and innovation policy.** Investments in research and development should be guided by wider societal interests. The industrial revolution, the information technology revolution and the emergence of the knowledge economy provide examples of the role of technology in catalysing transformations.

## RESHAPING THE RELATIONSHIPS BETWEEN THE ENVIRONMENT, SOCIETY AND THE ECONOMY

### TRANSFORMATIONS FOR SOCIAL JUSTICE

**Wide disparities exist in access to life-sustaining natural resources, such as food, water and energy, among different population groups in the region.** Lack of access is more prevalent among the rural populations, impoverished households and women. Increasing access to natural resources for these population groups requires a human rights approach to development.

**Changing inequitable outcomes requires a change in inequitable processes that produced them.** Initiatives to redress these inequalities are emerging, although often at the local level, including community-based management of natural resources, corporate and civil society partnerships and participatory budgeting.

**Governments can create the enabling conditions to accelerate these emerging and existing efforts.** Doing so would trigger the transformation that redresses inequalities by translating international commitments into national frameworks and laws adhering to the principles of human rights. It would enlarge spaces for multistakeholder participation, promote access to information and promote more equitable flows of investment. Transparent governance and political will to engage stakeholders to achieve the 2030 Agenda are needed for social justice transformation to reduce inequalities.

## TRANSFORMING ECONOMIC STRUCTURES

**Many economies are undergoing economic transformations in a context of severe environmental constraints related to climate change, land use change and resource availability.** Globalization and other changes mean that the patterns and characteristics of more recent growth processes already diverge from the experience of industrialized countries. The most urgent actions involve increasing the productive capacities of developing countries, fostering sustainable consumption and production, keeping within environmental limits to improve economic resilience and addressing income inequality.

**Aligning regional megatrends, such as economic integration, with sustainable development requires structural changes in the incentive framework to get the prices “right”.** Also needed are long-term investments in sustainable development, low-carbon economic infrastructure and strengthening the transformative capacity of economies. Emerging niches, such as renewable energy and innovative business models that are based on social entrepreneurship, present strong potential for supporting economic structural transformation.

**Technological innovation will be an important contributor to achieve sustainable development but it will not be sufficient.** The new economic transformation needs to be built around a shift from resource-intensive and environmentally destructive patterns of development to sustainable ones. A shift in the balance of inputs (including all types of resources) involved in the process of production must complement sectoral shifts.

**As economic structures change, so do the skills required.** Investments in education to ensure that populations are able to adapt and benefit are needed to deliver an economic structure transformation that is also just.

## TRANSFORMING INVESTMENT FLOWS

**Mobilizing the Asia-Pacific region’s capital is essential for achieving the Sustainable Development Goals (SDGs).** Too little investment is supporting the transition to a green economy, and too much continues to be invested in high-carbon and resource-intensive, polluting economies.

**Transforming financial flows will address systemic issues.** These include environmental externalities that remain unpriced and the rules and incentives governing financial markets that disadvantage long-term perspectives in decision-making and consumption and production behaviour. The impacts of environmentally and socially beneficial investments are inadequately valued. Such market distortions can lead to a misallocation of capital and increase the potential risk to an economy and flow of ecosystem services.

**There is an urgent need to act to accelerate the transition to a green economy by better directing the financial system towards building the resilience and the long-term success of an economy.** This means more effective regulations and policy initiatives that support sustainable development objectives. The region is rich with good practices on financial market policy and regulatory innovations that support the greening of financial systems.

## TRANSFORMING RESOURCE USE

**Trends in material, energy and water use indicate significant scope to improve the efficiency of resource use in the region.** Transformation towards sustainable resource use could be achieved by high-level policy action to reform the incentive frameworks that govern resource use and investments. Among the structural policies that are important are those that address pricing mechanisms, nudge consumers, manufacturers and investors to make sustainable choices and enable and reward innovation of more efficient and less polluting technologies.

**These policy reforms help to nurture and create bottom-up actions that increase demand for resource-productive products and services.** Introducing policy reforms also means getting rid of inefficient policies. The SDGs and the management of urbanization present critical opportunities to invest in infrastructure and processes that can lead to sustainable resource use for decades to come.

## CAPACITIES AND REGIONAL COOPERATION FOR DRIVING TRANSFORMATIONS

**Governments must develop the capacity to set a clear direction for transformations and initiate strategies to steer society in that direction.** Mainstreaming shared societal values into legislation, discourse and practice is critical when the issues are complex and when the power and capacities of different stakeholders to shape agendas and ideas are highly unequal. Governance should be adaptive and emphasize monitoring, learning and reflection.

**There must be government capacity to implement structural changes.** While there is a range of literature discussing the various policy instruments, what is lacking is discussion on how to create the conditions that enable the follow-through on policies. Managing such politically complex processes requires confronting issues of power and vested interests and recognizing the values of all stakeholders. Implementing structural changes also requires the capacity to recognize and act on political windows of opportunity that may arise during times of crisis.

**Capacity to manage the transformation process will determine the outcomes.** Managing transformation means coordinating top-down State-driven actions with support for stakeholder alliances and innovations, mitigating any distributional impacts of transformation and coordinating horizontal and vertical actions to respond to complex multisector and multidisciplinary issues. The role of local governments and capacity to create spaces for meaningful citizen engagement through legislation and policy are important elements when managing transformation.

**Regional cooperation holds the potential to establish shared normative visions and can help to align regional megatrends with the needs of sustainable development.** Regional trade and investment frameworks and responses to common regional challenges (urbanization, energy security and resource scarcity) must be used by governments to facilitate joint investments in strategic niches that have high transformative potential. Emissions trading systems, for instance, would deliver more environmental and economic benefits if the geographic coverage is larger. Transformation needs to be underpinned by a “skills revolution” in learning and innovation capacity and facilitate the flow of knowledge, technological know-how and financial resources.

**The most crucial issues in the environmental domain that require regional investments in research revolve around understanding and monitoring regional and local thresholds of planetary limits.** Good practices in increasing energy efficiency, renewable energy, green buildings, public transportation systems and technological innovations are emerging that can facilitate peer learning across the region. The Asia-Pacific Forum on Sustainable Development can facilitate this, particularly in the context of mobilizing the means to follow through on the SDGs, to follow up and review the progress towards the 2030 Agenda and garnering mutual support for transformations.

**The opportunities for delivering on the expectations of the wide range of stakeholders who invested time and resources in shaping the 2030 Agenda for Sustainable Development has never been greater.** As United Nations Secretary-General Ban Ki-moon emphasizes, “What counts now is translating promises on paper into change on the ground.”









# 1

## STATE OF THE ENVIRONMENT AND REGIONAL OUTLOOK FOR SUSTAINABLE DEVELOPMENT

### KEY MESSAGES

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Whether any of the 17 goals of the 2030 Agenda for Sustainable Development move beyond a vision to achievement in 15 years' time will depend on how we make use of the opportunities provided by regional megatrends, such as urbanization, rising incomes, changing consumption patterns and economic and trade integration.

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Aligning the megatrends with sustainable development requires changes in the structures and rules that mediate the relationship between the economy, society and nature. Transformation in social justice, investment flows, economic structures and resource efficiency is imperative.

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Environmental trends underline that there is urgent need for transformations for sustainable development. That time frame within which these transformations need to take place is much shorter than the time taken for previous societal transformations in history.

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The needed transformations are mutually supportive and essential for responding to the Sustainable Development Goals in a way that allows policy coherence and prevents trade-offs between goals.

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## 1.1 THE NEED FOR A TRANSFORMATION TO SUSTAINABLE DEVELOPMENT

*"We are determined to take the bold and transformative steps needed to shift the world onto a sustainable path."*

With this declaration in the 2030 Agenda for Sustainable Development, the world's leaders committed in 2015 to unprecedented transformation.

Although people are now wealthier, better nourished and more educated than they were 15 years ago, the world remains far off a sustainable path. Commenting on the progress since the establishment of the Millennium Development Goals in 2000, the United Nations Secretary-General's synthesis report on the post-2015 development agenda pointed out:

"Amid great plenty for some, we witness pervasive poverty, gross inequalities, joblessness, disease and deprivation for billions.... The impacts of the global economic, food and energy crises are still being felt. The consequences of climate change have only just begun."<sup>1</sup>

The understanding that transformative rather than incremental changes are needed goes beyond the political realm—scientists also agree that "transformation" is an appropriate term to describe the extent of the changes needed.<sup>2</sup>

This report is for policymakers and other stakeholders to help them take action towards transformative change in the Asia-Pacific region, in line with the 2030 Agenda for Sustainable Development.

The 2030 Agenda describes a better future in several dimensions—from poverty, hunger and want, where there is universal literacy, peace, security and safe and healthy environments. A future in which all life can thrive, children are invested in and there is universal access to quality education and health care. And a future in which the rights of all are also respected, the use of all natural resources takes place at a sustainable rate, humanity

lives in harmony with nature and critical ecosystems are protected.

In that future, the 17 Sustainable Development Goals (SDGs) and targets that comprise the 2030 Agenda "are integrated and indivisible and balance the three dimensions of sustainable development". Through these ambitious goals, multiple co-benefits are expected across the economic, social and environmental dimensions of the development process.<sup>3</sup>

Until now, co-benefits across the three dimensions of sustainable development have been elusive. Nature and people are often treated as externalities in economic decision-making, for instance. Environmental resources are given zero value and are believed to be infinite. Human rights are treated as negotiable or applicable on a case-by-case basis. As a result, both public and private investments can erode rather than build and sustain environmental, human and social capital. Changes in economic structures do not always provide the best outcomes for people and the planet, and patterns of resource use do not reflect their finite nature.

For this future we want and for the purposes of this report, "transformation" is a change in society that alters the "fundamental attributes of a system (including value systems; regulatory, legislative, or bureaucratic regimes; financial institutions; and technological or biological systems)."<sup>4</sup>

Transformations for sustainable development must be based on the reform of the relationships between the environment, the economy and society. New mindsets and behaviours, incentives and shared values must work towards a sustainable future. ♣

## 1.2 ALIGNING REGIONAL MEGATRENDS WITH SUSTAINABLE DEVELOPMENT

The 2030 Agenda for Sustainable Development provides guidance and direction setting, but the responses need to be fine-tuned and adapted to the realities of the region and each country. The 2005 edition of the *State of the Environment in Asia and the Pacific* report pointed out that the major challenge is how to continue

the economic growth required to improve quality of life while meeting the basic needs of all inhabitants and reducing the pressure on environmental carrying capacity.

Ten years later, this challenge remains. The political consensus at the Paris Conference of Parties of the United Nations Convention on Climate Change set the stage for markets, for businesses, for technology developers and for infrastructure developers to foster a transformation that was previously thought beyond reach.

The potential for this transformation to quickly take root in the region should not be underestimated. The region is now home to more than half of the global population and produces 35 per cent of the world's gross domestic product (GDP). This is a region of people on the move, better educated, with more purchasing power, enjoying improved quality of life and access to information and communications technology that has allowed the spread of new opportunities, social connections and ideas. Intraregional trade and investment flows now shape infrastructure development and spur private sector growth and economic structure changes in almost every subregion. More inclusive forms of governance are beginning to address sustainability crises.<sup>5</sup>

But there remains a dark side to this progress. The region's contributions to global CO<sub>2</sub> emissions more than doubled between 1990 and 2012 (Figure 1.1). Development paths across the region are characterized by high resource intensity, increasingly evident resource constraints, widening income and social inequalities and persistent unmet needs.<sup>6</sup> The extraction of resources to meet the needs (and demands) of an expanding consuming class as well as infrastructure development influences global resource-use trends.

Regional overviews of sustainable development have also highlighted the shared concern that the considerable economic potential will not benefit all—and that deepened social divisions as well as other dimensions of social and demographic change will lead to social and political conflicts.<sup>7</sup>

Of the 56 countries in the Asia-Pacific region covered by this report,<sup>8</sup> 12 retain least developed country status. More than 2.6 billion people live on less than \$2 per day in 2016, 1.5 billion people are without access to sanitation, and approximately 277 million people are

without access to an improved water supply in 2015.<sup>9</sup> Economic expansion has not benefited all—millions of workers are vulnerable, and the numbers of working poor are increasing.

The economic structures across the region are strongly resource dependent. The resources used within the region have tripled since 1990.<sup>10</sup> Resource-efficiency improvements, where they exist (in energy and water use mostly) have not been enough to compensate for the increase in the consumption of these resources (as discussed in Chapter 3). In some countries that use the largest proportions of their water resources, water use per capita is quite low and can be expected to grow (Figures 1.3 and 1.4). Across the region are signs of resource use beyond capacity. The Aral Sea, for instance, remains a symbol of environmental catastrophe (Box 1.1).

There are still shortcomings in the capacity to deal with the most fundamental aspects of environmental quality, such as air pollution (Figure 1.2). Biodiversity loss is a direct impact of habitat loss related to resource use, in particular deforestation, which still impacts the region, especially South-East Asia (Figure 1.5).

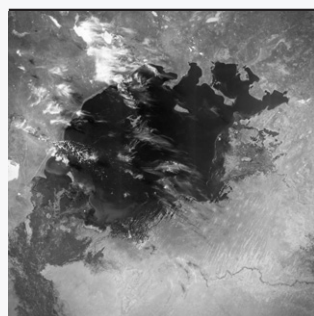
Environmental constraints and ecosystem changes are part of a business-as-usual future that will impact everyone. Without urgent intervention, these environmental pressures and changes will have immediate impact on water supplies with growing pressure due to population growth, rapid urbanization, industrialization and economic expansion;<sup>11</sup> and rural livelihoods and food security, including through impacts on fish stocks (Box 1.2).<sup>12</sup>

As previous reports in this series have stressed, future resource constraints will be a major concern for this region. Rising consumption, economic expansion and natural resource constraints are already aggravating geopolitical tensions in the region. Economic structures, investment patterns and resource constraints that affect the most vulnerable of populations are likely to lead to social tension and constrained economic growth and dynamism.

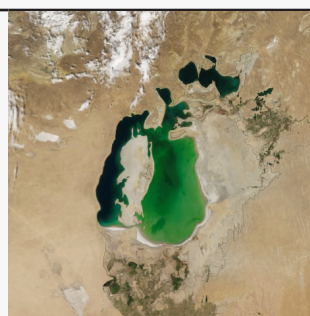
The regional trends in rapid urbanization, economic structure change, trade and economic integration, rising incomes and changing consumption patterns have defined the development outcomes for the region. These

**Box 1.1**  
The Aral Sea  
loses its eastern  
lobe

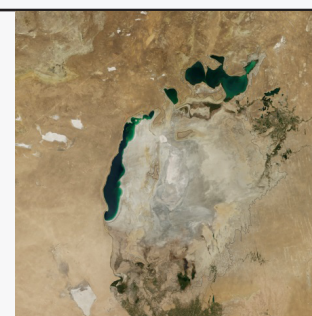
In the summer of 2014, the eastern basin of the Aral Sea went completely dry—for the first time in 600 years—due to farmland irrigation. In 2005, a World Bank-funded dam and restoration project began in Kazakhstan with the goal of improving the health of the Aral Sea. Since then, the water level has risen and salinity has decreased. Yet, 2014 satellite images (below) indicate that the cyclical drying appears to continue, particularly in the eastern basin.



22 August 1964



20 August 2000



19 August 2014

Source: NASA Earth Observatory, 2015.

megatrends are transformative forces by nature,<sup>13</sup> hence their power to either improve or undermine the prospects for achieving sustainable development.

### Rapid urbanization

The Asia-Pacific region added nearly one billion people to the urban population between 1990 and 2014.<sup>14</sup> Urban

growth will continue to be significant, with half of the population expected to be urban by 2018.<sup>15</sup> Seventeen of the world's 28 megacities are here; in 2030 the region may have 22 megacities.<sup>16</sup>

Urbanization processes will be instrumental in the transformation for sustainable development because of the dominant contribution of cities to economic and population growth and the pressure to deliver infrastructure and basic services (housing, services, transport and commercial space) in short periods of time.

Urbanization and associated lifestyle changes<sup>17</sup> increase the demand for material consumption, drive land-use change and greenhouse gas emissions. Whether urbanization becomes a positive force for sustainable development depends on actions and investment decisions taken now to prevent the entrenchment of high-carbon, resource-intensive path dependencies and social divisions in cities.

A commitment to sustainable development is a commitment to shared prosperity and environmental protection. Asian and Pacific cities must become places in which environmental protection and an enhanced quality of life for all (with good access to services provided by high-quality, resource-efficient infrastructure and vibrant economies) are mutually supportive.

**Box 1.2**  
Oceans: The  
region's coral  
reefs at risk

The region has vast areas of coastal and marine ecosystems, which are critical for livelihoods and food security. Major threats to coral reefs from climate change are the increase in sea surface temperature (such as coral bleaching) and ocean acidification.<sup>a</sup> Ocean acidification may increase by 170 per cent by the end of the century, bringing significant ecosystem and economic losses. At this rate, coral reef erosion is likely to outpace reef building sometime this century.<sup>b</sup> These environmental changes particularly threaten the coastal communities and economies of Australia, New Zealand, the Pacific island countries and countries in East and North-East Asia.

Source: <sup>a</sup> UNEP, 2011; <sup>b</sup> International Council for Science, n.d.



## Economic structure change

With rapid urbanization there has been rapid economic growth and structural change. Many countries in the region began transitioning from agriculture biomass-based economies to modern industrial and service economies in the 1970s. The share of agriculture as a percentage of regional GDP has halved, from 14 per cent in 1970 to 7 per cent in 2012, while the contribution of services rose from 46 per cent to 59 per cent. The share of industry declined during that time, from around 40 per cent to 34 per cent.<sup>18</sup>

The economies of Japan, Hong Kong (China), the Republic of Korea, Singapore and Taiwan Province of China have completed this transition. While their experiences have been diverse, these economies have similar features: economic growth that outpaced the rest of the world; changing sectoral composition towards a diminished share of agriculture in GDP; and a dramatic increase in labour productivity.

The economic transition of the region has been accompanied by significant increases in the consumption of natural resources, making the region the largest user of materials since 2003. Since the 1970s, the opening up of several economies has been a huge part of the region's economic transition story—China in the late 1970s, Viet Nam in the late 1980s and, recently, Mongolia and Myanmar. Without exception, their transition towards market economies was followed by a period of rapid economic growth.

The continuing transformation of the economies will have long-term implications for the increasing resource use and the region's material footprint, depending on where investments are directed, the types of infrastructure that are built to support economic growth and the governance mechanisms used to manage the tension between the environmental risks and economic opportunities, especially those related to resource extraction.

Economic structural changes have been accompanied by labour productivity (output per person employed) increases.<sup>19</sup> During 2000–2014, labour productivity increased more rapidly in Asia and the Pacific than in any other region in the world (3.2 per cent per year relative to the global average of 1.1 per cent). The average annual growth rate in labour productivity since 2000 was greatest

in Azerbaijan, followed by Armenia, Georgia, Kazakhstan and Timor-Leste.<sup>20</sup> Economies that experienced a high rate of labour productivity increases (Japan, the Republic of Korea and Taiwan Province of China) have also experienced a rapid increase of consumption and improvements in living standards. At the same time, however, labour participation rates have been higher for men than women in most countries.

Increases in labour productivity are important for growth but are also linked with the phenomenon of jobless growth that is a regional concern. In many places, labour productivity improvements have been achieved due to increased inputs of energy and capital-intensive investment. Expansion of economic activity in new sectors as well as investments in labour-intensive, high-value “green” sectors (such as renewable energy) will help to increase an economy's capacity to create new jobs while increasing labour productivity, creating more employment and reducing environmental pressures.<sup>21</sup>

Sustainable development requires that an economy's capacity to create decent jobs is increased and that economic activities and lifestyles become less resource intensive and more resource efficient.

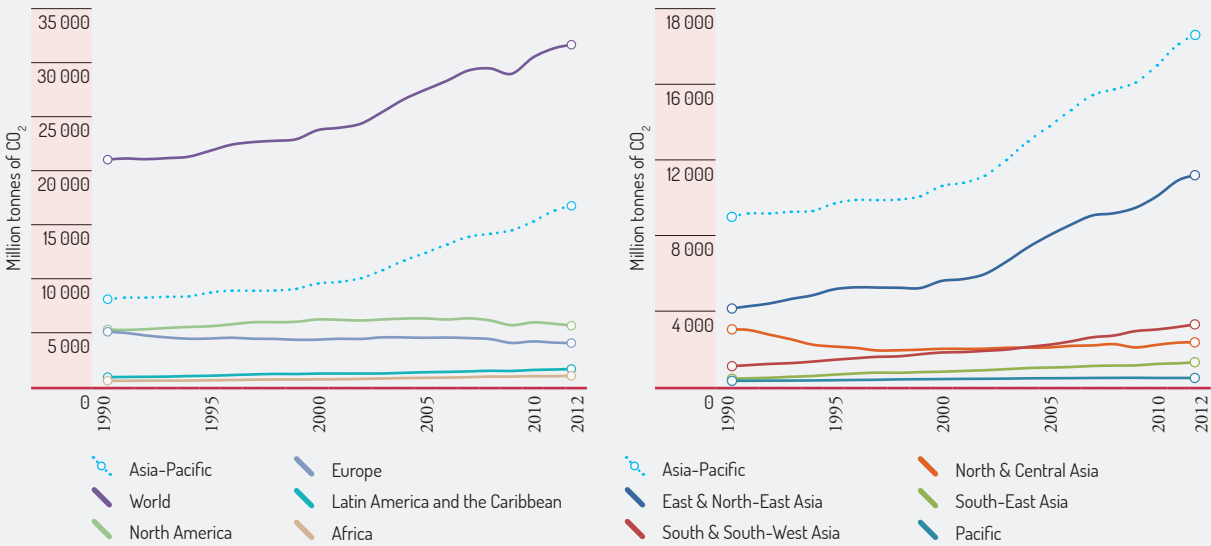
## Trade and economic integration

Global trade is characterized by increasing levels of integration, with Asia the fulcrum of the emerging trade architecture.<sup>22</sup> Many countries are negotiating major trade agreements.<sup>23</sup> A 2014 report from the Economic and Social Commission of Asia and the Pacific (ESCAP) described the region as “the most dynamic pole of the global economy”,<sup>24</sup> with around 60 per cent of the 262 preferential trade agreements that were in force at that time.<sup>25</sup> Intraregional foreign direct investment is also expanding in importance.<sup>26</sup>

More regional cooperation on trade would beget both benefits (technology and information transfer and investments in green technologies) and risks to the environment (resource extraction and greater movement of goods and services). Trade integration will not automatically support sustainable development—it requires establishing the upward convergence of environmental standards (a race to the top rather than to the bottom) as an intrinsic feature of trade agreements.

ATMOSPHERE: AGGREGATE GREENHOUSE GAS EMISSIONS ARE INCREASING.

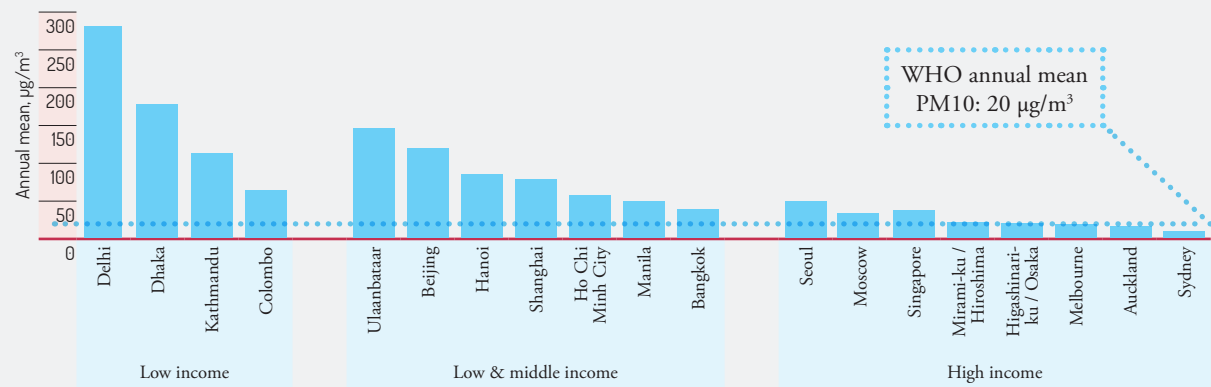
Figure 1.1 Asia and the Pacific's contributions to global CO<sub>2</sub> emissions from fuel combustion, 1990–2012



Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, CO<sub>2</sub> emissions from fuel combustion statistics.

AIR: AIR QUALITY IN SELECTED CITIES IN ASIA HAS REACHED UNHEALTHY LEVELS.

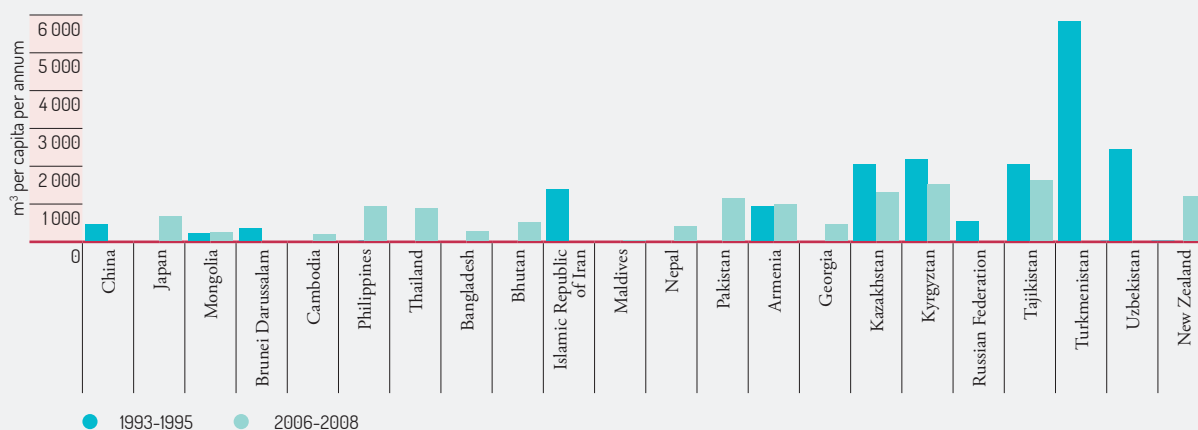
Figure 1.2 Ambient (outdoor) air pollution in selected cities, 2008–2013



Source: World Health Organization ambient (outdoor) air pollution data in cities, 2014.  
See [www.who.int/phe/health\\_topics/outdoorair/databases/cities/en/](http://www.who.int/phe/health_topics/outdoorair/databases/cities/en/).

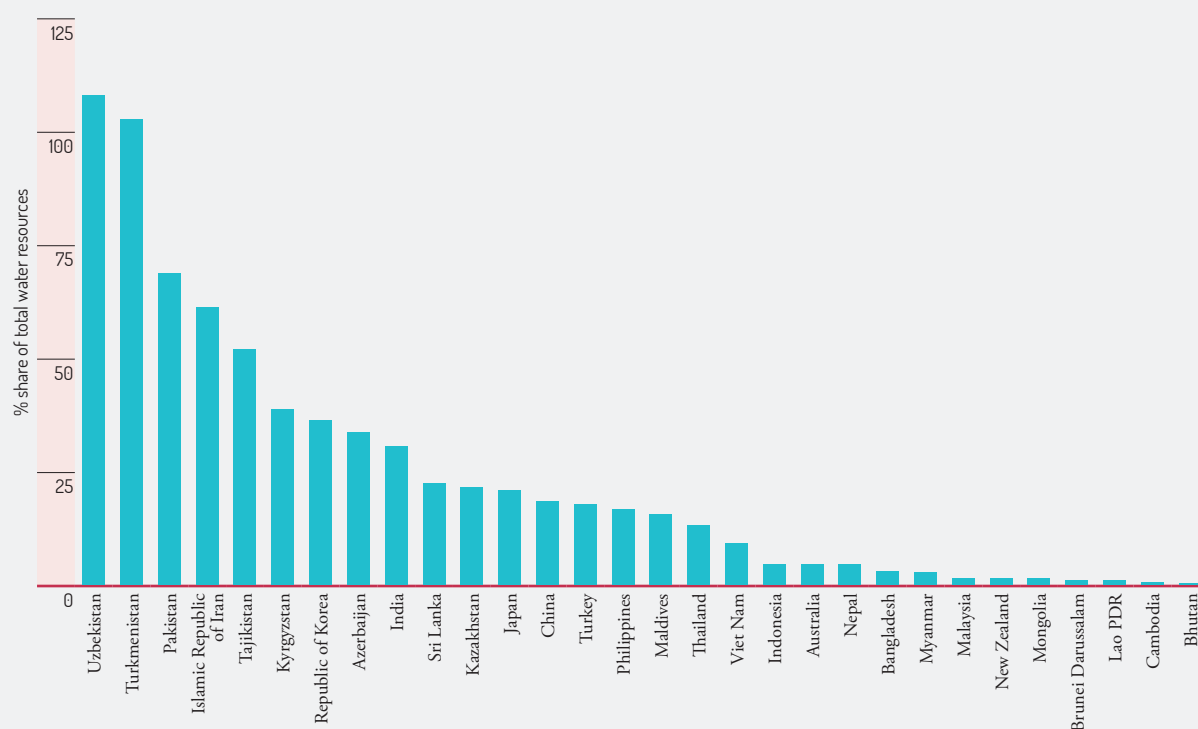
## FRESHWATER: MANY COUNTRIES FACE WATER STRESS, ALTHOUGH FRESHWATER USE PER CAPITA IS DECREASING AND IS LOW IN MANY OF THE WATER-CONSTRAINED COUNTRIES

Figure 1.3 Freshwater withdrawal per capita, 1993–1995 and 2006–2008



Source: ESCAP statistical database, based on data from AQUASTAT, FAO (accessed 1 Feb. 2016).

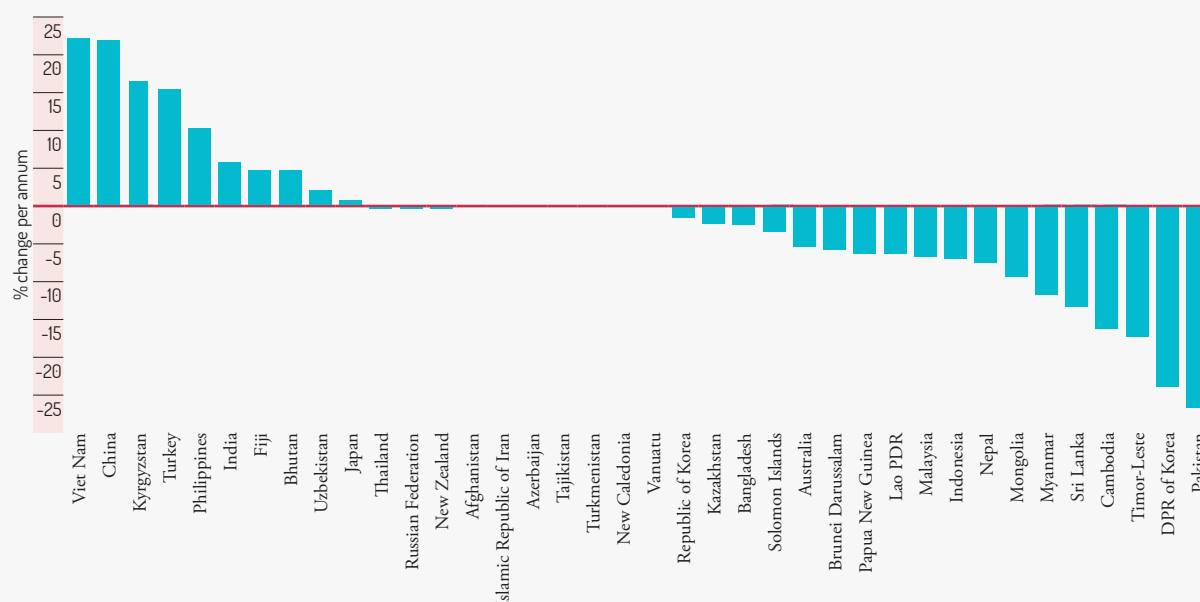
Figure 1.4 Total freshwater withdrawal as share of total renewable water per annum, 1990–2010 average



Source: United Nations Statistics Division, 2015.

## LAND: LAND-USE CHANGE IN THE REGION IS ACCELERATING BIODIVERSITY LOSS IN DEVELOPING COUNTRIES.

Figure 1.5 Percentage change in forest cover, 2000–2012



Source: ESCAP statistical database, based on FAOSTAT and Global Forest Resource Assessment 2010.

Regional economic relationships must encourage a competitiveness that is defined by high levels of environmental quality and reduced environmental risk, shared prosperity and decent jobs for all so that markets deliver expanded opportunities.

### Rising incomes and changing consumption patterns

Rapid economic growth has resulted in the expansion of the consuming class, which in turn have stimulated strong consumption growth.<sup>27</sup> Although there is no agreed definition of what constitutes a consuming class,<sup>28</sup> it is often understood as associated with the middle class, whose numbers range from 500 million to 1 billion, according to Asian Development Bank (ADB) estimates.<sup>29</sup> Asia is expected to soon have a larger middle class than North America and Europe combined<sup>30</sup> and has reportedly become the world's second-wealthiest region and is projected to soon overtake North America.<sup>31</sup>

The environmental consequences are not insignificant—the consuming class demand for energy, goods, metals and water will put considerable pressure on natural resources and the environment.<sup>32</sup> Private demand will have implications for the demand of public services and infrastructure (more cars need expansion of roads and related infrastructure; larger houses increase demand for electricity and water).

With better education and awareness of environmental issues, the new consumers could become a driving force for sustainable development transformations via their purchasing and investment decisions. But this will require innovations in the provisions of services and goods and nudging social preferences towards sustainable choices. ♦

### 1.3 TRANSFORMATIONS FOR SUSTAINABLE DEVELOPMENT

The regional megatrends will benefit the region in the short term. Without transformations in social justice, investment flows, economic structural change and resource use patterns, ultimately these megatrends will impede achievement of the SDGs.

Resource efficiency transformations seek to bring together the objectives of environmental protection, economic growth and social progress to ensure that economic activity stays within the environmental limits and that all people have the potential to access the resources that they need. In the context of urbanization trends, such a transformation will focus the attention of city governments on infrastructure that uses energy, water and other resources efficiently and services that promote resource-efficient and low-waste lifestyles. In the context of trade and economic integration, resource efficiency transformation will foster a competitive region less vulnerable to fluctuations in resource prices and constraints and environmental risks. As incomes rise and consumption patterns change, resource efficiency transformation will shift consumer preferences and producer behaviour towards more sustainable choices and lifestyles.

Social justice transformation will move people from the periphery to the centre of economic and other decisions, ensuring that all people have access to the services and resources they need. By ensuring that human rights are respected, that people have a voice in decisions that impact them and that they have access to information, cities will become places that enhance the well-being of all. Regional trade and economic integration processes will be strengthened by human and social capital that are invested in rather than degraded; environmental protection and access to natural resources will be maintained for local populations who most need them. Rising incomes and changing consumption patterns will also enhance well-being for all rather than entrench social differences.

Transformations in investment flows will ensure that investments in environmental protection and natural capital are given greater priority and promote a higher-quality of economic growth. Through a reshaping of markets and other incentives, cities will attract investments to infrastructure and services that are more

resource efficient and promote a higher quality of life while reducing environmental risks. The expanded investment flows that are expected to accompany regional trade and economic integration will be attracted to “greener” economic activities and practices, driving growth that is in greater alignment with sustainable development outcomes. Consumers will have access to choices that are more in line with sustainable development.

Economic structure transformations will boost the productive capacities of the region on the basis of sustainable consumption and production patterns and more equitable distribution of the benefits of economic growth. By changing the incentive frameworks and capacity of economies to diversify towards more resource-efficient products and services that need higher value-added employment, innovative business models that prioritize social capital and environmental protection can be scaled up as cities grow and as economies integrate and intraregional trade expands. Technological innovation can shift the balance of economic inputs so that human capital, skills development and a focus on resource efficiency can complement and strengthen ongoing sectoral shifts.

These transformations are mutually supportive and linked. They comprise essential requirements for achieving the 2030 Agenda for Sustainable Development and for much-needed policy coherence, which will reduce the potential for trade-offs between the SDGs. ✦

### 1.4 INTRODUCING THIS REPORT

Transformation involves confronting assumptions of business-as-usual approaches and their manifestations in policymaking and governance.<sup>33</sup> Lasting and ambitious transformation on the scale required to achieve sustainable development requires shifts in the relationships between integrated social, economic and environmental systems.

While the literature on sustainable development has extensively discussed the actions and policies required for sustainable development, there has been less attention on the systemic changes and governance capacities that will enable scaling up good practices and policies to the

extent required to create the critical mass needed for transformation.<sup>34</sup>

This report therefore takes a closer look at the challenge of a transformative development agenda and how governments can foster transformations. Chapter 2 explains the four areas of necessary transformation and how transformations take place. Each focusing on a particular area, Chapters 3–6 delve into why transformation is needed in that area and which countries it is most relevant to, then describes the top-down, structural changes needed, examples of specific innovations that can be scaled up as well as the governance capacities needed to foster transformation.

The final chapter covers the specific governance capacities required to support transformation in direction setting, implementing structural change and managing transformation processes. It also proposes the way forward for regional cooperation to support national, subregional, regional and global transformation for sustainable development. ❀

## ENDNOTES

- 1 United Nations, 2014.
- 2 A recent IPCC report (Field and others, 2012) states, “Actions that range from incremental steps to transformational changes are essential for reducing risk from climate extremes.”
- 3 Puppim de Oliveira, 2013.
- 4 IPCC, 2012.
- 5 Zusman and others, 2014; Berkhout and others, 2010.
- 6 ESCAP, 2014d.
- 7 See for example, ESCAP, 2014d.
- 8 ESCAP members.
- 9 ESCAP, 2016.
- 10 UNEP, 2013.
- 11 See [www.worldwildlife.org/threats/overfishing](http://www.worldwildlife.org/threats/overfishing) and [www.fao.org/news/story/en/item/234106/icode/](http://www.fao.org/news/story/en/item/234106/icode/).
- 12 Commercial species are already in castastrophic decline. See [www.unesco.org/new/en/unesco/about-us/who-we-are/director-general/singleview-dg/news/water\\_resources\\_in\\_the\\_asia\\_pacific\\_region\\_are\\_increasingly\\_threatened\\_by\\_pollution\\_and\\_vulnerable\\_to\\_natural\\_disasters/#.Vm\\_KTKxPpjo](http://www.unesco.org/new/en/unesco/about-us/who-we-are/director-general/singleview-dg/news/water_resources_in_the_asia_pacific_region_are_increasingly_threatened_by_pollution_and_vulnerable_to_natural_disasters/#.Vm_KTKxPpjo).
- 13 See Megatrends, [www.pwc.co.uk/issues/megatrends/issues/shift-in-global-economic-power.jhtml](http://www.pwc.co.uk/issues/megatrends/issues/shift-in-global-economic-power.jhtml).
- 14 ESCAP, 2016.
- 15 UN-Habitat and ESCAP, 2015.
- 16 Ibid.
- 17 See [www.pwc.co.uk/issues/megatrends/issues/rapid-urbanisation.jhtml](http://www.pwc.co.uk/issues/megatrends/issues/rapid-urbanisation.jhtml).
- 18 ESCAP, 2014e.
- 19 There are different ways to measure labour productivity. Two of the most widely used measures are output per (actual working) hour and output per person employed.
- 20 ESCAP, 2016.
- 21 UNIDO, 2013.
- 22 Ernst & Young, 2015.
- 23 See for example, The Trans-Pacific Partnership and Regional Comprehensive Economic Partnership.
- 24 ESCAP, 2014a.
- 25 ESCAP, 2015b.
- 26 ESCAP, 2014a.
- 27 OECD, 2013.
- 28 According to a McKinsey study (McKinsey Global Institute, 2012), the consuming class consists of individuals with an annual income of more than \$3,600, or \$10 per day at purchasing power parity, using constant 2005 dollars.
- 29 The estimates depend on the definition adopted. See ADB, 2010, p. 48.
- 30 See [www.pwc.co.uk/issues/megatrends/issues/shift-in-global-economic-power.jhtml](http://www.pwc.co.uk/issues/megatrends/issues/shift-in-global-economic-power.jhtml).
- 31 See [www.theguardian.com/business/2015/jun/15/millionaires-asia-europe-wealth-report-bcg](http://www.theguardian.com/business/2015/jun/15/millionaires-asia-europe-wealth-report-bcg).
- 32 ADB, 2010, p. 48.
- 33 Brand and others, 2013; Daly, 2003; Robert and others, 2012.
- 34 Meadowcroft, 2011.







# 2

## FRAMING TRANSFORMATION FOR SUSTAINABLE DEVELOPMENT

### KEY MESSAGES

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Transformations towards more sustainable development will occur only if policymaking frameworks recognize the environmental limits at the different scales, from local to planetary.

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The world, including the Asia-Pacific region, is moving to a polycentric governance system in which no individual, organization or government has full control of development decisions and outcomes. The forces for transformation and solutions for collective-action problems will be both “top-down” and “bottom-up”, bringing about a combination of efforts in different scales.

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Countries in the Asia-Pacific region have led many innovations to better integrate the environmental limits into their respective economy and society in the past decades that are rich with insights for future initiatives and possibilities for scaling up.

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In addition to high-level leadership, transformations require fostering further innovation, scaling up niches and building alliances among diverse stakeholders at the subnational level and in civil society.

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## 2.1 INTRODUCTION

As Chapter 1 describes, the changing development context, environmental challenges and regional megatrends define the prospects for achieving the SDGs within Asia and the Pacific.<sup>1</sup> The region's development model and economic system have brought about large socioeconomic benefits, such as a reduction in the level of poverty, but they have also introduced significant risks to human and planetary health.<sup>2</sup>

Decoupling the economies from the environment is needed to achieve sustainable development. However, decoupling implies a large change in the political and economic systems, which are not likely without large societal transformation at both the top (national) and the bottom (local) levels, which in turn would need a radical change in governance structures, stronger institutions and capabilities to support the transformation at the global, regional, national and subnational levels. Total decoupling is not possible for the whole system and ecological boundaries are necessary in many cases. ♦

## 2.2 TRANSFORMATION CHALLENGES AND POTENTIAL

Social scientists have long studied transformational processes in society.<sup>3</sup> Some disciplines, such as sociology, are concerned with societal transformations because they are necessary to make changes in the way society functions.<sup>4</sup> The transformations emphasized here include changing institutions from the top rungs of society to initiate system changes at the national or regional level and to facilitate the creation and dissemination of innovative yet sustainable alternatives at the bottom rungs (subnational governments, consumers, civil society organizations and industry players).

The challenges of transformation differ across countries. The transformations needed to reshape the relationship between nature and people in the context of economies that are challenged by high population densities and pressures to meet basic needs, such as in Bangladesh where social development goals are still to be met, cannot be compared with those in other countries where the interactions between nature and society are stressed by large per capita use of natural resources, consumption

and emissions. In those countries, transformation for sustainable development will mean a focus on sustainable consumption and production.

The urgency of transformation in all countries cannot be overstated. While the benefits of previous transformations, such as the industrial revolution or the green revolution in agriculture, took decades to emerge, the transformation to sustainable development has a much tighter time frame—less than one generation to make the changes needed to prevent drastic climatic change.<sup>5</sup>

The goals of the 2030 Agenda for Sustainable Development for the twenty-first century encompass the achievement of human development for all while maintaining essential life-supporting systems for the next generations. Yet, the region is far from having the comprehensive governance and policy mechanisms for transforming the development processes to achieve some of those goals.

Nevertheless, the diversity of the region and its policy and other innovations create unique opportunities for the exchange of experiences, resources and ideas and for cooperation and collaboration, such as sharing policy frameworks, capacity building, joint regional mechanisms and technology exchange. This could put the region in a position to lead large transformations worldwide. ♦

## 2.3 TRANSFORMATIONS FROM THE TOP AND FROM THE BOTTOM

The physical environment, the economy and society are intrinsically interrelated and constantly interacting, shaped by economic, social, technological and political systems. The way individuals, organizations and institutions influence those systems reflects how they understand the environment-economy-society relationship, which also evolves over time. For instance, early discussions on the environment-economy relations found them to be in conflict, leading to proposed “limits to growth” to solve the environmental problems.<sup>6</sup> The concept of sustainable development was coined with the proposal that economic development could be compatible with environmental protection and social equity.<sup>7</sup>

More recently, the green growth paradigm, which is widely recognized and adopted in Asia and the Pacific, proposed the possibility of decoupling the economy from the environment to achieve sustainable development. However, the absence of ecological boundaries limited the results in the long term, and economic growth offset the environmental efficiency gains.

There are some evolving national initiatives that seek to establish alternative development that are worth exploring, such as Gross National Happiness in Bhutan (Box 2.1), which has attracted considerable international attention. In the Pacific, leaders committed to set up large-scale marine protected areas, including the Phoenix Islands Protected Area in Kiribati, the Palau National Marine Sanctuary, the Cook Islands Marine Park and the Natural Park of the Coral Sea in New Caledonia.<sup>8</sup>

There are also multiple bottom-up niche initiatives emerging from civil society, businesses and subnational governments, such as Tokyo's cap-and-trade scheme for

carbon emissions (Box 2.2), which should be nurtured and expanded. The Tokyo Metropolitan Government has worked with neighbouring Saitama Prefecture to replicate the cap-and-trade scheme.

Global society is evolving to a polycentric governance system of collective action<sup>9</sup> in which no individual, organization or government has full control of the development decisions and outcomes for all stakeholders. The forces for transformation and the solutions for collective action problems will not be top-down or bottom-up but a combination of both in different scales. The final outcome, an ideal transformation, will be the result of the synergies of those initiatives.

Thus, individual initiatives by local, national and regional organizations as well as joint efforts to maximize resources and impact and promote coordination among different levels of networks are essential to transformation and for avoiding zero-sum approaches and the perpetuation of social injustice.<sup>10</sup> ♦

#### Box 2.1 Alternative development in Bhutan

Bhutan has had unique experiences in guiding its development policies. The country is well known for initiating the Gross National Happiness approach to development, which includes a multidimensional assessment of the quality of life and well-being of its citizens, based on four pillars (sustainable and equitable socioeconomic development; environmental conservation; preservation and promotion of culture; and good governance). The Government has used Gross National Happiness rather than economic growth to steer its development policies. The concept of Gross National Happiness is now on the agenda of many other countries.

One important component of Bhutan's development strategies is the articulation of environmental limits. The country's Constitution recognizes the importance of the environment to the culture and well-being of citizens. It mandates that forests should cover 60 per cent of Bhutan's territory, guaranteeing the functioning of the ecosystems for future generations. The Government has used a series of policies to follow through on the guarantees contained in the Constitution, such as the establishment of a network of protected areas covering more than 40 per cent of the country's territory. Bhutan has developed hydropower as its main source of modern energy, whose sales to India also provide revenue for supporting the development policies. And the country has started to experiment with electric vehicles to use the vast hydropower resources to boost a more sustainable transportation fleet in the growing urban areas around the capital.

Certain political and institutional conditions have facilitated these innovative initiatives. The political transition process from an absolute to a constitutional monarchy led the country to a more democratic society in which many issues can be discussed openly. The concern to protect Bhutan's distinctive culture and environment (and to avoid irreversible losses in its natural and cultural heritage) led to the inclusion of several safeguards in the Constitution. Bhutan's unique political and administrative systems, in which religious affairs are interwoven with administrative affairs in the bureaucracies at the national and local levels, prioritize the issues that determine cultural values in development policies.

Source: Based on field work carried out by Jose A. Puppim de Oliveira in April 2015.

Box 2.2  
Tokyo  
innovations in  
urban climate  
policy

In 2010, the Tokyo Metropolitan Government (TMG) introduced a mandatory CO<sub>2</sub> emission reduction and a cap-and-trade emission trading scheme. It is the world's first such scheme that sets binding targets for buildings. The scheme has made a transformation in the city's emissions, with the total greenhouse gas emissions reduced by 23 per cent on average from the base years and 10 per cent below the average of other parts of the country before the end of the first compliance period of five years (2010–2014). By the end of fiscal year 2013, total emissions were reduced by 23 per cent on average from the base years; 90 per cent of nearly 1,350 regulated facilities achieved the first reduction target, and 69 per cent of them even met the 2019 targets. The policy innovations from the world's largest city and the capital of Japan are rich with insight on the potential barriers and opportunities for introducing mandatory greenhouse gas emission reductions in cities, such as the following essential components that enabled successful policymaking and implementation.

#### FACTORS FOR SUCCESS IN POLICYMAKING

*Administrative leadership and capacity of public administration.* The design and implementation of Tokyo's mandatory carbon reduction and emission trading scheme was based on the accumulation of administrative capacity to lead the way in pollution control, dating back to as early as the enactment of the Tokyo Industrial Pollution Control Ordinance in 1949.

*Fair involvement and facilitation of stakeholders in policy design.* A range of stakeholders were involved with the design of the mandatory schemes from the early stages, which resulted in their legitimacy and support for climate policy. Stakeholder participation is regarded as the principal factor behind the acceptance of the policy and subsequent compliance to the mandatory scheme.

*Availability of historical data to support the discussions.* The TMG had decade-long data to analyse industrial activities and existing reduction plans, which informed the detailed institutional design and allowed it to match local conditions. The ultimate acceptance of the mandatory framework by the industrial sector was also possible because of the open policy discussions with stakeholders, which were supported by the factual data.

#### FACTORS FOR SUCCESS IN IMPLEMENTATION

*Transparency in monitoring and enforcement.* One of the reasons for the high compliance for the Tokyo scheme was the monitoring and enforcement mechanisms and their transparency. Even though detailed data for individual buildings are not released to the public because they contain business strategy information, the reporting, reduction calculations and associated trading processes of each large facility are monitored by the TMG and verifying organizations. For the facilities that have difficulty fulfilling the requirements, simple diagnostic and advisory services for energy use are provided for free by the TMG to assist them.

*Gradual implementation.* The gradual implementation of the policy in the main phases led to a learning process for both the TMG and regulated agents, which helped to adjust the policy as it moved ahead. The process also raised awareness and habituated emission reduction as part of regular business activities. Obligatory reduction, therefore, did not come out of the blue for compliance facilities; the eight years of prior reporting prepared them to set their own realistic goals.

*Flexibility.* Regulators were flexible in the policy design after listening to stakeholders; they also created categories with different compliance requirements. Stakeholders were invited to present their opinions, and the pros and cons were extensively discussed. Suggestions for the mandatory measures and flexible arrangements, such as differentiation of compliance factors among facilities, were included due to the concerns and opinions raised by stakeholders.

The scheme helped to identify areas for further improvement. The availability of historical data and the gap between reporting and enforcement helped many regulated agents to better understand the functioning of their facilities related to greenhouse gas emissions and identify areas for improvement. According to the TMG, as much as 90 per cent of the regulated facilities plan to continue emission reduction measures even after reaching the targets; 80 per cent of them said their decision to change their everyday business environment was stimulated by the TMG's climate policy.

Source: Roppongi, Suwa and Puppim de Oliveira, forthcoming, 2016.

## 2.4 BUILDING CAPABILITIES TO INNOVATE FOR TRANSFORMATION

Transformation will mean developing or changing the institutions and capabilities to promote changes (at the national or regional levels) to support and unleash the potential for the creation and expansion of innovative niche initiatives at the bottom rungs (subnational level). The role of the State and international organizations is to build institutions that encourage the creation and clustering of good practices or innovative niches for transformation at the different levels of governance. Changes in institutional frameworks must reshape unsustainable incentives, harness existing stakeholder efforts and provide direct support for technological, policy and societal innovation. Structural changes from the top must be complemented by specific action to scale up and nurture niches—areas for sustainability innovations, such as renewable energy, cleaner transportation, organic food and sustainability-themed investing. Thus, the sustainable niches will become mainstream practices that displace unsustainable practices rather than remaining marginal.

Specific actions to foster the scaling up of niches include the sharing of information, networking and awareness raising. This process should be powerful enough to impact global policy norms. The role of education is crucial to change the mindsets of future generations. Through the spread of ideas and financial and other support, niches can grow and evolve to become the norm. The abolition of slavery, for instance, was the result of a social movement against slavery, fostered by niches comprising religious and campaign groups that came together to spread awareness around the world between the eighteenth and the twentieth centuries. It evolved to become a political movement and over a century resulted in the recognition of freedom as a human right by Article 4 of the Universal Declaration of Human Rights in 1948.<sup>11</sup>

Enabling the clustering of niches through new coalitions, partnerships and networks could create social movements that enable changes in the political and market arenas that lead to structural changes, resulting in a transformative process.<sup>12</sup> Mechanisms for rapid learning among individuals, organizations (including governments) and societies can facilitate the scaling up of niches and spread transformative changes across countries and regions.<sup>13</sup>

There are several other strategies that could be used to favour and manage the creation of niches. One involves the provision of resources, such as knowledge, finances, skills, participation in decision-making, providing physical space for experimentation and putting in place institutional or other policy changes that influence mindsets and increase viability and acceptance. Monitoring and evaluating the transition process provides valuable feedback to change agents or helps anticipate a different course of action to be taken.<sup>14</sup> Adaptive and inclusive governance approaches are critical for fostering the emergence of niches, providing important support to enabling actors to access resources, impact on decision-making and build alliances with like-minded niches and coalitions of stakeholders. There is extensive literature on innovation and learning processes, with most of the studies centred on firm-led, high-end technical innovation through patents and new products for the market.<sup>15</sup>

A general problem with the studies of transitions in the growing literature on sustainability transitions<sup>16</sup> and innovation systems that focus on technological innovation<sup>17</sup> is that they assume that the capabilities and governance for innovation and transformation already exist. The literature presents interesting conceptual frameworks to understand societal transitions through descriptive cases but does not make clear under what conditions<sup>18</sup> and how to create the capabilities to make such transitions.

In the context of developing and emerging economies in the Asia-Pacific region, capabilities for transformation for sustainable development can build on the inherent competencies that have been responsible for transformations in other arenas over the past few decades.<sup>19</sup> At the same time, transformations for sustainable development require wider participation by individuals, companies and other kinds of stakeholders than has been previously encouraged.

The potential of technology to facilitate transformations should be harnessed by science and by innovative policy; investments in research and development should be guided by the interests of the wider society and the potential of such technology to bring benefits to diverse groups of stakeholders, in particular those who are most marginalized or underserved in society. The industrial revolution, the information technology revolution

and the emergence of the knowledge economy provide examples of the role of technology in this regard, in many cases supported by government initiatives, such as the internet. An emerging sustainability revolution, with large-scale use of sustainable technologies, such as renewable energy and energy-efficient equipment, should be backed with relevant investments in science, technology and innovation. ✦

## 2.5 MULTILEVEL GOVERNANCE AND CIVIL SOCIETY

Reforms to support transformation must be underpinned by shared values and a broad understanding that change needs to happen. A government acting alone does not often succeed—transformations need dynamic alliances between different kinds of stakeholders (the private sector, engaged citizens and active civil society organizations) and different kinds of institutions (academia, think tanks and those responsible for monitoring and accountability, among others).

Change can be brought about when alternatives are grounded in the political and social forces of participation through democratic processes and social movements, particularly at the grass-roots level.<sup>20</sup> These local movements can generate viable alternatives to ecological commodification and degradation. Innovative ideas in many sectors, such as moving “from ownership to access” in the discussions on intellectual property and forests,<sup>21</sup> provide important impetus to such movements. These movements, however, often end up marginalized and disempowered, co-opted by mainstream unsustainable movements over time or blocked by political systems when they do not have support from the top.<sup>22</sup>

Thus, larger societal transformations require supportive governance structures in order to scale up viable opportunities or niches. In previous decades, the discourse on governance had a tendency to allocate large proportions of responsibility to the private sector and civil society and/or to establish structures parallel with governmental ones in response to perceived weaknesses and incapacities in the public domain. But this created an accountability gap in public decision-making and implementation.

Transformation implies a more accountable and responsible role for all actors, including the State. At the international level, such as in the Asia-Pacific region, investment cooperation and trade agreements may boost economic growth. But trade per se is unlikely to automatically provide the solutions to the environmental problems and can even intensify some problems, such as climate change, if the proper institutional frameworks are not in place.<sup>23</sup>

Transformation should also be built on the basis of scientific information and broad dialogue with scientists and different stakeholders. Strengthening the policy-science dialogue would help guide what action to take.<sup>24</sup> The participation of a broad range of stakeholders and transparency in decision-making would help give legitimacy to the transformation process and help to overcome obstacles in the political economy. ✦

## 2.6 ENABLING CONDITIONS AT THE TOP AND BOTTOM

A radical change in the institutional environment at the different levels of governance is fundamentally necessary for safeguarding the planet from possible catastrophic environmental changes and their social and economic consequences.

Initiatives from the top may be vulnerable to changes in governments if they are not rooted in acceptance by local institutions and organizations. The Republic of Korea, for example, established the idea of green growth as a national policy. The Government pushed a series of green projects and investments with some good results. Nevertheless, the limited links with grass-roots movements led to some resistance, and a new administration (after elections) recognized the limits and slowed down the green growth efforts (Box 2.3).

Likewise, if initiatives from local governments or civil society do not have institutional support from the top, they may find it difficult to continue in the long term. The Sustainable Living Initiative in Malaysia (SLiM) was a civil society-led attempt to integrate ecological footprints into household or government planning. Even though the movement inspired some portions of the society and Government towards the goals of Rio+20, it faded away

after 2012 because it could not garner support from the top to sustain its initiative (Box 3.4).

In the realm of economics, alternatives to “prosperity without growth” or keeping the economy in a “steady state” have been proposed by some well-known ecological economists and critics of the ecological situation.<sup>25</sup>

Keeping the current economic system, even in a de-growth situation, will lead to continuous ecological degradation and exacerbation of many social problems. Even though economists do not point to any definitive solution, some proposals ask for a post-consumerism or even a post-capitalist ecological economy: “Either we save capitalism or we save ourselves.”<sup>26</sup> Thus, the underlying logic for

#### Box 2.3 Green growth in the Republic of Korea

The Republic of Korea’s green growth policies have transformed the way the country has confronted its environmental challenges: promoting the idea that economic growth and environmental protection go hand in hand and that environmental protection can become a new driver of growth.

Based on those policies, the Government launched a series of green projects and investments that led to some improvements, such as in energy efficiency. But those efforts have not been sufficient to decouple greenhouse gas emissions and use of natural resources from economic growth. Many green growth policy targets have yet to be realized. The hoped-for transformation in investment flows and positive environmental outcomes is still in progress.

Political change (after national elections) in 2013 led to reflection on the implementation of green growth, with recognition of the achievements and limitations. The relaunched Green Growth 2.0 aims to ground the green growth efforts in a more bottom-up approach to sustainable development. The case of the Republic of Korea underscores that even with strong government commitment, leadership and policy support, the transformative potential requires stakeholder engagement and an explicit focus on fostering innovation. The complexity of sustainable development challenges, for example in the restoration of a major river system that had unintended environmental consequences (the Four Rivers Project), requires a science-policy interface that engages scientists and environmentalists in design and implementation.

Broad consensus on overall green growth strategies and a clear understanding of the aspirations and expectations of local groups now will be needed to reverse opposition to green growth in some quarters of Korean civil society, which had claimed that top-down innovations were not in line with their interests and did not take into account their views.

Nonetheless, as a policy and technological innovator, the Republic of Korea continues to provide important green growth policy lessons for countries across the region.

Source : Bluemling and Yun, 2016; Korea Energy Economics Institute, 2013.

#### Box 2.4 Sustainable living in Malaysia

Sustainable Living in Malaysia (SLiM) is a concept developed by the Environmental Protection Society Malaysia (EPSM), one of the oldest NGOs in the country. SLiM is based on ecological footprint analysis to understand the impacts of human activities in Malaysia and include ecological limits in the development agenda. EPSM launched a campaign to disseminate the SLiM concept to government, businesses and civil society in 2007, organizing several workshops, conferences and publications. SLiM received significant attention from the media and civil society, leading many organizations to disseminate the concepts and to apply them in practice.

EPSM has led national efforts to quantify carbon, food and water footprints in households through surveys, leading to a better understanding of people’s lifestyles and showing that Malaysia’s footprint was larger than its biocapacity, with global impacts as well. EPSM initiatives contributed to the Rio+20 discussions in Malaysia by incorporating the impacts of human activities resulting from development patterns. EPSM and other NGOs used the results to advocate for sustainable lifestyles and better integration of the environment into national development planning strategies, as well as natural resource accounting and management. The long-term success of this initiative will partly depend on sustained government support.

Source: Based on field work carried out by Jose A. Puppim de Oliveira in September and October 2015.



finding alternatives that will lead to transformations is to move beyond the mainstream position that the solution to the ecological and social crises of the twenty-first century can be found only through free-market capitalism.

Radical societal transformations ask for an overall change in the economic system and have many components because “the required transformation goes far beyond innovation and structural changes to include democratization of the economy, better distribution of income and wealth, power over markets, and a culture of sufficiency”.<sup>27</sup> ♦

## 2.7 RECOGNIZING ENVIRONMENTAL LIMITS IN POLICYMAKING

Proposed ecological modernization<sup>28</sup> alternatives, such as green growth, are better than the traditional “brown growth”. However, evidence has shown, both in theory and practice, that green growth and other efforts are insufficient to move the Asia-Pacific region beyond its path of unsustainability.<sup>29</sup> China is a prominent example of strong commitment to improve efficiency and promote renewable energy. China has become one

### Box 2.5 Our urban anthropocene

Cities have been recognized as key to the governance of climate change.\* As the world takes an unprecedented rural-urban population tilt, the twenty-first century poses a challenge for tackling disparities in access and allocation of carbon between urban and rural areas. Urbanization is historically correlated with the massive use of fossil fuel initiated by the industrial revolution. Some carbon accounts are strongly associated with production and consumption of energy within cities, indicating that more than 70 per cent of the global greenhouse gases are produced within urban areas and consume 60–80 per cent of final energy use globally.

In addition to the global North-South economic divide, there is a stronger component of urban-rural spatial disparity in the making. Evidence based on analyses of data from more than 200 countries over five decades shows that the rates of urbanization are more correlated with carbon emissions than with wealth (GDP per capita). Urbanized middle-income countries emit carbon per capita similarly to richer countries. This urban-rural divide is likely to further precipitate into a much local but complex dynamic, particularly relevant to the developing world, which faces the double challenge of rapid urbanization and environmental sustainability. This has implications for designing a fair global regime for tackling climate change and achieving the Sustainable Development Goals due to ethical, empirical and governance gaps related to the urban-rural carbon dynamic.

The issue is of serious concern for urban areas in the developing world. As these countries urbanize, the contributions of carbon emissions and greenhouse gases from their cities become disproportionately high in comparison with their population share and wealth. Most of the population growth for the remainder of this century reportedly will occur in urban areas of low- and middle-income nations. UN-Habitat and ESCAP’s *State of Asian and Pacific Cities 2015* report has pointed out that Asia alone added one billion urban dwellers in 30 years (1980–2010), more than the population of Western Europe and the United States combined. And it is expected to add another billion by 2040.

Thus, a radical and urgent transformation in the way we build our cities is necessary to avoid a disproportional increase in carbon emissions and inequalities between rural and urban emissions. The inclusion of cities in Sustainable Development Goals 11 offers an opportunity to promote solutions for sustainable cities globally. It also hands leaders the responsibility to impose ecological limits that affect people and the environment beyond their borders.

There are immense barriers in changing urbanization paths, however. For example, India, the next large urbanization frontier, has many political, financial and institutional challenges to changing its urbanization patterns. There is an urgent need to catalyse and scale up innovations that provide adequate housing, energy access, transportation and economic opportunities for its growing urban population in a sustainable manner. The climate co-benefits would be immense from changes towards more sustainable urbanization patterns, but the institutions and capabilities in place need to be strengthened to lead the transformation.

Note: \*See Bulkeley and Betsill, 2005.

Source : Sethi and Puppim de Oliveira, forthcoming 2016a; Sethi and Puppim de Oliveira, forthcoming 2016b.



of the world's leaders in both wind and solar power, with several tangible co-benefits. In the Xinjiang Uygur Autonomous Region, the use of wind energy generated tremendous co-benefits, including the mitigation of CO<sub>2</sub> and air pollutant (SO<sub>2</sub>, NO<sub>x</sub> and PM<sub>2.5</sub>) emissions and water savings, during the eleventh Five-Year Plan period (2006–2010). This led to nearly \$1.4 billion, or almost 0.5 per cent of GDP, in energy savings, as discussed in Chapter 5 (Box 5.4). The country pledged ambitious targets in the 2015 Paris Agreement under the United Nations Framework Convention on Climate Change. Yet, even though China reduced its carbon emissions from fuel combustion per unit of GDP by 55 per cent between 1990 and 2011, emissions per capita tripled in the same period<sup>30</sup> and are larger than the EU-27 average, though China is still much poorer. The Republic of Korea more than doubled its emissions per capita in the same period, although it reduced its carbon emissions from fuel combustion per unit of GDP by more than 14.5 per cent (Box 2.3).

Transformations for environmental sustainability require, as a basic condition, the recognition of ecological limits at different scales, from local to global, as the 2015 Paris Agreement specifies.<sup>31</sup> Countries in the Asia-Pacific region have led many innovative initiatives to better integrate the environmental limits into their economy and society in the past decades that provide important lessons for future initiatives. In Bhutan, for example, constitutional provisions require minimum forest cover (Box 2.1).

Tokyo's mandatory carbon reduction scheme (Box 2.2) is one of the most innovative initiatives to address greenhouse gas emissions from urban centres; the scheme comprises an emission cap that includes buildings. Urbanization rates are more correlated to carbon emissions than income per capita, creating an urban-rural divide in carbon emissions (Box 2.5). Thus, climate co-benefits in urban Asia, such as achieving climate and other development goals at the same time in cities, is fundamental to change the path of the urbanization megatrend in the region and reduce carbon emissions globally.<sup>32</sup> If replicated by other cities in Japan and elsewhere in the region, the policy innovation used in Tokyo could curb the growing impact of urbanization on climate change. ♦

## 2.8 CONCLUSIONS

The way megatrends evolve in the region can undermine or support the achievement of the SDGs. Transformations must be supported from the national government level (top-down) but also fostered from subnational governments, consumers, civil society organizations and industry players (bottom-up) to change the quality of the region's development in the long term. Several Asian and Pacific countries have strengthened their regulations and tailored certain policies towards more sustainable development in different degrees. Many developing countries, however, do not have the human, technical and financial resources to implement those actions or leapfrog in terms of their development process to avoid the mistakes of the past in other countries. Thus, international cooperation is important for providing political leverage, government capacities, resources and technology to make transformations viable.

In addition to high-level leadership, transformations require fostering further innovation, the scaling up of niches and the building of alliances among diverse stakeholders at the subnational level and in civil society to achieve enduring change and long-term impact on development patterns. The right institutional environment is needed to nurture the bottom-up efforts, including local support and legitimacy for the top-down initiatives.

National and subnational efforts that recognize the ecological limits in the development process will succeed in the long term only if there is strong cooperation and coordination with other countries within the region to avoid leakages, such as an exodus of polluting industries from one country to another. The leakages could undermine individual efforts for transformation and lead to a continuing increase in the total carbon emissions in the region, despite some countries taking the lead to change their development path.

Building regional rules for cooperation in recognizing the ecological limits and institutions to support the functioning of those rules would incentivize individual countries, sectors or local initiatives and produce optimal results. The development of regional institutions would also facilitate the linking of Asian and Pacific countries with global actions and strengthen the participation

of regional leadership in global regimes, which could attract external resources to the region. The 2015 Paris Agreement could be a good opportunity to spur the needed transformations because countries will have to commit to ecological limits, and funding and technological cooperation will be available to facilitate the transformative processes.

The transformative changes in systems should include a transition that does not ruin the economic and social achievements of the past decades. The participation of a broad range of stakeholders and transparency in the decision-making processes ensures legitimacy and helps to overcome political economy obstacles, such as powerful economic interests that might be opposed to the changes. But the new systems need a governance regime that will ensure that the region does not end up worse off by losing the democratic freedoms and material well-being gained in the past decades. The argument that the current systems are the best political and economic systems is not sufficient excuse to not improve the current systems. ✨

## ENDNOTES

- 1 United Nations, 2015a.
- 2 Whitmee and others, 2015.
- 3 For example, see Polanyi, 1944.
- 4 O'Brien, 2012, pp. 667–676.
- 5 IPCC, 2012.
- 6 Meadows, Meadows, and Randers, 1972.
- 7 Brundtland Commission, 1987.
- 8 ESCAP, 2015b.
- 9 Ostrom, 2010, pp. 550–557; Ostrom, 2010, pp. 641–672.
- 10 Puppim de Oliveira, 2014, pp. 108–129.
- 11 WBGU, 2011, pp. 96–97.
- 12 Fischer-Kowalski and Rotmans, 2009, p. 3.
- 13 Argyris and Schon, 1978; Mezirow, 2000; Tschakert and Dietrich, 2010.
- 14 Fischer-Kowalski and Rotmans, 2009, p. 3.
- 15 Freeman, 1982; Lundvall, 1988; Nelson, 1993; OECD, 2005.
- 16 Geels, 2002, pp. 1257–1274; Geels, 2005, pp. 681–696.
- 17 Figueiredo, 2001.
- 18 Meadowcroft, 2011, pp. 70–75.
- 19 Amsden, 2001; Kwack and Lee, 1982, pp. 358–393.
- 20 Khotari, 2016.
- 21 Sunderlin, Hatcher and Liddle, 2008.
- 22 Martinez-Alier, Temper and Demaria, 2016.
- 23 Hoffmann, 2011.
- 24 UNDESA, 2015.
- 25 Daly, 2003, 1997; Jackson, 2011.
- 26 Jackson, 2009.
- 27 Smith, 2014.
- 28 The idea that the environmental problems will be solved by the continued modernization of the economy and society through new technologies and management tools.
- 29 Puppim de Oliveira, Dale, and Mathai, 2016.
- 30 ESCAP statistical database.
- 31 UNFCCC, 2015.
- 32 Puppim de Oliveira and others, 2013, pp. 1–6; Puppim de Oliveira, 2013, pp. 7–14.





# 3

## TRANSFORMATION FOR SUSTAINABLE RESOURCE USE

### KEY MESSAGES

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With rising affluence, changing lifestyles and population growth, the outlook for the future indicates increasing pressure on the natural resource base.

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Transforming the pattern of resource use in the region towards decoupling economic growth from resource use, waste and pollution is critical, given that the achievement of the Sustainable Development Goals depends on the availability and accessibility of natural resources, which are finite.

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Transformation towards sustainable resource use and resource efficiency could be achieved by a combination of high-level policy action to reform the incentive frameworks that govern resource use and investments and bottom-up actions by consumers, civil society organizations and industry players. Policy reforms would help nurture and create innovations in the production and provision of resource-efficient goods, services and infrastructure.

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The implementation of the Sustainable Development Goals and the management of urbanization trends in the region present a critical opportunity to invest in infrastructure and lifestyle changes that support sustainable resource use in the decades to come.

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### 3.1 INTRODUCTION

Current trends in rising incomes, lifestyle changes and economic activity are powerful drivers behind resource use in the Asia-Pacific region. As in other regions, these trends are also the drivers of environmental degradation.

Ensuring that environmental pressures do not exceed environmental limits—that the demand for resources does not exceed levels that can be sustainably provided by nature and that waste and pollution emitted do not exceed the absorptive capacity of the earth's system—is a primary condition of sustainable development.

A transformation from a resource-intensive development path to a resource-efficient development path is critical to the achievement of the SDGs.

Covering 26 countries for which data are available,<sup>1</sup> this chapter outlines the trends in resource use in the region and identifies how changes in the incentives framework through changes in policy can reshape resource-use trends. The discussion pays specific attention to sustainable urbanization as a critical focus for scaling up action on resource efficiency.

The challenge of transformation for resource efficiency is intimately related to the other challenges examined in this report. As resources become constrained, access to them as well as resource efficiency will increasingly become a matter of social justice. Economic structural changes and investment flows must be oriented towards resource efficiency; resource efficiency can be a source of innovation and economic transformation.

As Chapter 2 points out, the risks posed by a resource-intensive development pathway manifest differently across countries. In developing countries, the main risks relate to the rising cost of resources, the subsequent opportunity costs for development and the burden of waste management. In industrialized countries, the concern is mainly maintenance of the resources consumed and the environmental impacts. ❀

### 3.2 RESOURCE USE AND THE SUSTAINABLE DEVELOPMENT GOALS

All societies depend on natural resources—materials (biomass, minerals, metals, fossil fuels), water, energy and land—for the provision of food, feed, fuel and fibre. Some resources, such as water and biomass, are renewable if they are sustainably managed. Others, such as fossil fuels and metal ores, are non-renewable and, in the absence of clarity on their quantity, should be used conservatively.

Economies depend on inputs from natural resources. In the production of goods and services, resources are extracted, processed and transported. At the end of their life cycle, they are recycled or disposed. At each stage, energy is used, and employment, money and well-being are generated, among other benefits. Because turning natural resources into goods and services requires energy, there also are strong links between resource use, greenhouse gas emissions and damage and depletion of the environmental systems.<sup>2</sup> There are also links with the use of water and other resources (Box 3.1).

Global ecological changes triggered by resource use impact the availability and security of ecosystem services. In 2005, the United Nations Millennium Ecosystem Assessment found that 15 of 24 ecosystems that human survival is dependent upon were degraded and/or subject to unsustainable use. This implies major consequences for people and economic activities that depend on ecosystem services.<sup>3</sup>

Resource scarcity, degraded ecosystem services and social inequality are likely to negatively impact the fulfilment of the interlinked SDGs, particularly the eradication of poverty. The enormous challenge of bringing resource use in line with the limited ability of natural resources to renew and regenerate reverberates throughout the SDG targets.

Sustainable resource use is a goal that transverses the SDGs and a stand-alone target in Goal 12 (target 2): “By 2030, achieve the sustainable management of natural resources.” Other SDG targets speak to how this transformation can be achieved, the most critical being target 4 of SDG 8,

which highlights the importance of resource efficiency and sustainable consumption and production and achieving the maximum amount of socioeconomic benefits from the use of natural resources. Resource use is also the basis of SDGs 14 and 15 on marine and terrestrial resource use, respectively.

The nexus of SDG 2 on hunger, food security and sustainable agriculture, SDG 6 on the availability and sustainable management of water and SDG 7 on access to modern forms of energy encompasses the need for sustainable resource management. Sustainable resource use is also a prominent element in SDG 8 in the complex combination of aspirations towards sustained and sustainable economic growth; SDG 9, which focuses on the crucial task of building and extending infrastructure, and SDG 11 on cities and settlements, which will be an issue for the region and its urban transformation.

The next industrial transition will be defined by a context of resource constraints (especially in terms of materials, energy and ecosystem services), where previously resources were abundant. This presents both challenges and opportunities. For long-term economic prosperity and growth, the SDGs recognize decoupling<sup>4</sup> and the seizing of opportunities for resource productivity so that a nation can produce greater economic value with fewer resource inputs (both material and energy) per unit of value and while mitigating the risks of resource shortfalls and import dependence.

When considering where to focus policy efforts, decision-makers need to look as closely as they can at the productivity changes in the resources that matter most to them. Decoupling allows economic outputs to be achieved with fewer resource inputs, thus reducing waste and saving capital. Those funds can then further expand the economy or reduce its exposure to resource risks.

Increasing resource productivity is technologically possible. Technologies and techniques that bring significant resource productivity gains are already available across the range of resource-consuming activities, with different technologies applicable at different levels of economic development. Many nations have achieved decoupling of economic growth from numerous pollutants, like sulphur dioxide emissions, with some having achieved modest

### Box 3.1 The materials, energy and water nexus

The use of one type of resource is usually associated with the use of other types of resources. The production of biomass requires water use, and water use (apart from rain-fed agriculture) requires energy for irrigation and transport. Another example is the material footprint of energy production, in particular the shift towards low-carbon energy technologies, which requires more materials, such as the metals needed for wind turbines, batteries and photovoltaics and the increase in materials needed for transmission in more decentralized energy systems.

#### Useful references:

Rasul, G., Managing the food, water, and energy nexus for achieving the Sustainable Development Goals in South Asia. *Environmental Development* (2015). Available from <http://dx.doi.org/10.1016/j.envdev.2015.12.001i>.

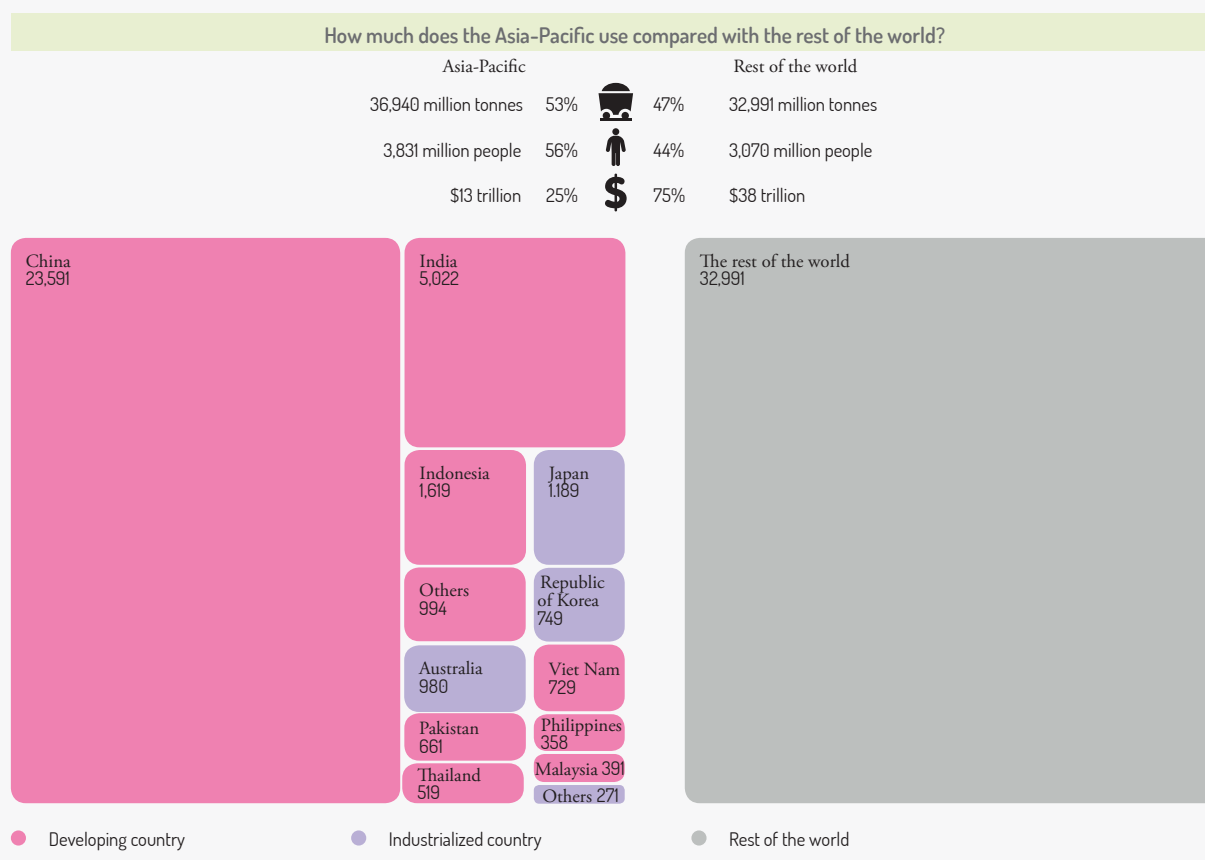
United Nations Environment Programme, *Green Energy Choices: The Benefits, Risks and Trade-Offs of Low-Carbon Technologies for Electricity Production—A Summary for Decision Makers* (2015). Available from [www.unep.org/resourcepanel/Portals/50244/publications/Summary\\_for\\_Policy\\_Makers\\_GHG\\_I.pdf](http://www.unep.org/resourcepanel/Portals/50244/publications/Summary_for_Policy_Makers_GHG_I.pdf).

progress in separating economic growth from growth in greenhouse gas emissions and from growth in the use of some resources. ✿

## 3.3 RESOURCE USE IN THE ASIA-PACIFIC REGION

Resource use over the past four decades has increased massively. The flow of resources through the economy is the physical basis of economic activities in the region, which, if assessed, can complement the economic metrics to provide additional information on the quality of economic growth.

Figure 3.1 A snapshot of material use in the Asia-Pacific region, 2010



Source : United Nations Environment Programme (2015). *Resource Use in the Asia-Pacific: A Booklet of Infographics*. Bangkok. Available from [http://greeninfo.asia/Publications/Infographic\(Low-resolution\).pdf](http://greeninfo.asia/Publications/Infographic(Low-resolution).pdf).

### 3.3.1 MATERIAL USE

#### Material use for production

The materials covered in this report represent four categories: biomass (crops, animal products, forestry products), fossil fuels (coal, oil, gas), construction minerals and metal ores. Material “use” at the national or regional level is measured as the amount extracted from nature, plus imports and minus exports. The Asia-Pacific region consumes 59 per cent of the world’s materials, while accounting for 56 per cent of the world’s population and only 35 per cent of global GDP.<sup>5</sup>

As the region’s share of global GDP increases, its share of resource use will also increase. At an annual growth rate of 5 per cent, the region’s use of natural resources is also growing much faster than in the rest of the world:

- The use of materials in the region increased from 5.7 billion tonnes to 36.9 billion tonnes in the 40 years from 1970 to 2010.
- The seven countries (Australia, China, India, Indonesia, Japan, Republic of Korea and Viet Nam) with the highest domestic material consumption accounted for more than 91 per cent of the regional total of 36.8 billion tonnes in 2010.
- Material use per person for the developing countries in the region has increased fourfold, from 2.3 tonnes per person in 1970 to 9.3 tonnes per person in 2010, with the great majority of this growth post-1990.
- In industrialized countries, material use per person grew from 10 tonnes to 15 tonnes per person in the same period. These averages mask a wider range, from 1.7 tonnes per person in Bangladesh in 2010 to about 40 tonnes per person in Australia in the same year.



The resource efficiency of material use is measured by dividing material use by GDP (kg per dollar). Developing countries in the region use five times as many resources per dollar of GDP (5 kg per dollar) as the rest of the world, and ten times more than industrialized countries (0.4 kg per dollar) in the region. Although material efficiency is low in the region, indicating a huge potential for improvement, particularly in the developing countries, it is improving at a rate of 1.5 per cent per year. The improvement likely relates to the upgrading of technologies and the resource-efficient sectors expanding their GDP contribution.<sup>6</sup>

### Material use for meeting consumption needs

As a complement to material use, a metric called the “footprint” measures the amount of resources needed for a country’s consumption, regardless of location of production (Box 3.2). The region’s material footprint of consumption was 33.1 billion tonnes in 2010 (compared with the material use of 36.8 billion tonnes). The region’s material footprint of consumption grew threefold between 1990 and 2010. It is growing at an annual rate of 5.5 per cent, much faster than the growth rate of direct material use, indicating increasing local consumption.<sup>7</sup>

The construction sector accounted for most of the consumption between 1990 and 2010. Growth in material footprint was smallest in the agriculture sector, which increased only 1.8 times. The material footprint of consumption has grown rapidly in the region, especially in China, with a yearly average growth rate of 8.7 per cent (which reflects China’s tremendous growth in GDP) and, to a lesser extent, in India with an average yearly growth of 3.9 per cent.<sup>8</sup>

When a country’s or a region’s footprint is greater than its material use, which is the case for Japan, the Republic of Korea and Singapore, for example, it is an indication of outsourced material-intensive processes to other countries and a dependency on resources extracted and processed elsewhere.<sup>9</sup>

In their transition to a resource-efficient and green economy, such countries’ efforts will likely focus on increasing the efficiency of material use so that dependence on other countries can be minimized. The rate of footprint growth and final sectoral disaggregation

also gives insights into where policies geared to sustainable consumption (eco-labelling, sustainable infrastructure, product standards and certification) need to be focused.

When a country’s or a region’s footprint is smaller than its material use, which is the case for China, Mongolia and many other developing countries, it means that their economies are dependent upon demand for resources in other countries. It also means that they are taking on a larger share of resource-intensive sector-based production. In their transition to a resource-efficient and green economy, they may focus on improving efficiency in production through price signals, industry standards and regulations. The difference between the material use and footprint of developing countries in the region is 15 per cent, with some of the largest differences in Mongolia (54 per cent) and Cambodia (44 per cent).<sup>10</sup>

### Other implications of resource use—Biomass

The deliberate destruction of biomass through unsustainable land-clearing practices, in particular slash and burn, has been associated with severe impacts of transboundary air pollution in South-East Asia. The clearing of forests for agricultural crops like palm oil, logging and pulpwood clear-cutting has resulted in the loss of more than 2 million ha of forests, the increase of carbon emissions and the loss of biodiversity.<sup>11</sup>

Haze, however, has had the most direct impact on this subregion’s people, with particularly severe episodes in 2013 and 2015. The negative impact on health, economic activity, livelihoods and the environment are far reaching.<sup>12</sup> In addition to affecting the regional population and national economies, local communities near the source of the fires are by far the most impacted. The poor air quality not only affects their standard of living, it results in significant losses in business, health, tourism and workplace productivity.<sup>13</sup>

## 3.3.2 ENERGY USE

Energy use is measured by adding the energy value (in joules) of primary energy inputs (coal, petroleum, gas, uranium and renewable energy). Electricity is not counted because it is a product of the primary sources, unless it is imported or exported from a country or region.

**Box 3.2**  
What is a  
material  
footprint?

Even though the calculation of material use subtracts the mass of exported materials and adds the mass of imported products, it is still oriented towards measuring production because the mass of by-products along the supply chain remain within the producing country. For example, if a country exports electronics, only the mass of the finished products is subtracted; but the by-products of the mining ores and industrial wastes remain in the measure of material use, even if they are of no real use to anyone living in the country. The material footprint adds the material inputs that were required to produce the imported goods, such as the by-products of imported televisions (scrap metals, by-products of metal production, scrap plastics, etc.) and subtracts the by-products of exports.

Energy consumption has increased more than fourfold in the region over the past four decades, from less than 50,000 petajoule (PJ) in 1970 to more than 200,000 PJ in 2010 (the energy footprint in 2010 was almost 160,000 PJ, again indicating that more use was needed for the production of exports than the production (outside the region) of imports. This is deeply influenced by the growing needs of a rapidly urbanizing China, which represented 52 per cent of the region's energy use in 2010.<sup>14</sup>

Even though a large component of the growth in China and India has relied on coal, there has been growing dependence on petroleum and gas. In the developing countries, coal and petroleum represent three quarters of energy consumption, while in the industrialized countries it accounts for two-thirds of overall consumption. Per capita energy use varies considerably across the region, from approximately 5 gigajoule (GJ) per capita in Afghanistan to 230 GJ per capita in Australia.<sup>15</sup>

China's economy has become more service oriented (services being generally less energy intensive), and there has been massive investment in new or replacement electricity generation capacity. Additionally, the Government has pursued a number of energy and resource-efficiency initiatives over several decades. It has implemented mandatory energy performance standards

for high energy-consuming products in the thermal power, steel, non-ferrous metals, building materials and petrochemical industries.

Accounting for energy use and footprint is important for planning development because it is fundamental in a country's ability to produce and in households' ability to carry out their everyday activities. Energy sources are also increasingly traded and experience price and supply fluctuations; these factors make a secondary case for the need to improve efficiency and resilience.

### 3.3.3 WATER USE

The seven countries (China, India, Indonesia, Japan, Pakistan, Philippines and Viet Nam) with the highest water withdrawals in the region in 2010 accounted for almost 88 per cent of the regional total of 2,114 billion cubic meters. Total water withdrawal for the region as a whole grew slowly, compared with other material use and energy flows.<sup>16</sup>

Water use per person is decreasing, and water efficiency (litres per dollar of output) is improving, driven by the agriculture sector and irrigation. For the region, the relative sector-based shares of water consumption were 80 per cent for agriculture and 10 per cent each for industry and municipal waste in 2010.<sup>17</sup> 🌱

## 3.4 LEADING FROM THE TOP: STRUCTURAL CHANGES FOR SUSTAINABLE RESOURCE USE

### 3.4.1 OPPORTUNITIES, BARRIERS AND GAPS

There are several opportunities for policymakers to facilitate sustainable resource management (outlined in the succeeding sections), falling into two broad categories: technologies and policies. The region's forecasted economic development, infrastructure investment and household income levels are all set to continue increasing over the next decades. Policymakers and the private sector should make choices that positively influence the resource efficiency of this growth.

There is a lack of general awareness on the need to use natural resources effectively and efficiently and to minimize waste and emissions to ensure economic growth and human well-being over the next half century, although this is now changing as impacts on air, water and land are reaching levels considered hazardous for human health. This lack of awareness translates into significant market failure and policy gaps that could support resource efficiency.

Regional economic integration may well offer a platform to initiate debate and sensitivity. With better awareness, resource efficiency can start to be integrated into national development policies, providing a compass for sectoral policy strengthening.

Another weakness is the capacity for policy implementation and enforcement. While good policies exist in many countries, implementation capacity, especially at the subnational levels, is lacking for a broad spectrum of reasons, such as lack of funding, lack of human skill, weak governance systems and challenges in prioritization of efforts.

Importantly, many countries in the region have not established the evaluation and monitoring frameworks, processes, knowledge base, data and indicators needed to gauge success in achieving policy objectives. This lack of evaluation capacity is further exacerbated by a lack of enforcement capacity, especially at the subnational level in many countries.

### 3.4.2 POLICIES—REFORMING THE INCENTIVES FRAMEWORK

One of the central conditions for encouraging resource-productive investments in market economies is the relative price of resources. For a market economy to become resource-efficient, the price signals should reflect this as a societal goal.

When the true costs of resource consumption, the risks of resource constraints and the impacts of waste and emissions are not reflected in markets, waste is encouraged, productivity is discouraged and the negative impacts of resource use accumulate.

Governments can establish policies that directly affect resource prices. These policies can be price based (fees, charges, taxes or removal of subsidies) or rights based (tradable permits or auctioned user rights), the latter of which usually require the establishment of new market institutions (Box 3.3).

#### Benefits of reform

Tax and subsidy reforms can be used to correct the inadequacies of current pricing systems and to contribute to internalizing external costs associated with the extraction, processing and use of natural resources. They are usually equally motivated by other fiscal goals, such as tax revenues that can be used for financing technology development or resource productivity programmes if they are not used to lower other distorting taxes, such as labour taxes.<sup>18</sup>

For developing countries, what is perhaps particularly important is creating fiscal revenue from the extraction of their natural resources. This revenue can then be channelled into infrastructure, health services, education and pensions, among other socially beneficial investments. Extraction taxes can provide incentives to overcome the often careless and wasteful methods of extraction, while pollution taxes can disincentivize processes that generate air and water pollution.<sup>19</sup>

Policymakers have taken on the task of transforming economic activity towards resource efficiency and minimization of waste and emissions. China has operationalized “circular economy” principles and pollution control into its national policy frameworks, while its “eco-civilization” strengthens this approach by integrating environmental protection with societal and economic goals. China has also adopted the concept of Three Red Lines, which establishes a holistic approach to water resource management that respects environmental limits.<sup>20</sup>

Other countries, such as Cambodia and Viet Nam, have integrated green development principles into their policy frameworks. This advanced level of policy development in many countries can become a major economic competitive advantage in the decades to come.

**Box 3.3**  
Policy instruments to affect resource price

- Fees or charges are generally paid for the use of natural resources or for services in this context. Examples are water fees, wastewater charges, pollution charges and waste collection charges. They are compulsory, and their purpose is to recover the costs of providing a service. The proceeds of the fees or charges do not typically end up in a government's general budget; rather, they end up with the service provider (public or private). The massive success in reducing solid waste in the Republic of Korea, for example, is primarily attributed to the introduction of a volume-based waste fee system in 1995 (as opposed to a fixed monthly rate). A similar approach was employed to reduce food waste in early 2000.
- In contrast, taxes are primarily intended to raise revenues. They are compulsory payments to a government, appearing as revenues in the budget. Taxes can also have a strong incentive effect, inducing taxpayers to reduce the habits that lead to high tax payments. Where a tax takes the price of an economic resource further away from its true cost, its incentive effect is distortionary, and it adds inefficiency to the economy. For example, by increasing labour taxes while natural resource taxes stay the same, the incentive shifts to reducing labour at the expense of increased resource use (through increased defects, for instance).
- A subsidy is a fiscal benefit (such as a tax exemption or rebate) or financial aid (such as a cash grant or soft loan) provided by a government intending to support an activity considered desirable, such as food production, strategic industries or products or exports. A basic characteristic of all subsidies is to reduce the market price of an item below its true cost of supply. Very often, subsidies support the continued inefficient use of resources and not resource productivity. This is partly due to their primary motive as a tool of income support. Subsidies supporting the continued inefficient use of resources are often called "perverse subsidies"\* because their dynamic effects run counter to productivity goals.
- Feed-in tariffs offer cost-covering compensation to renewable energy producers. They provide secured returns on investments through long-term contracts to help new technologies overcome the biases towards existing technologies. Feed-in tariffs typically include three provisions: (i) guaranteed grid access; (ii) long-term contracts (15–25 years) for the electricity produced; and (iii) purchase prices based on the cost of generation. Often, the compensation is reduced over time, reflecting average cost reductions in producing the respective renewable energy.

Note:\*See Kent and Myers, 2014.

### Challenges for reform

A growing number of lower-income countries have embarked on tax and subsidy reform as part of their poverty reduction strategies, combining these with preferential water and energy tariffs that benefit the needs of the poorest. However, in many countries, the reform of environmentally harmful subsidies will remain a challenge for the foreseeable future due to the complexity of the subsidy landscape and the political unpopularity of subsidy reform by those currently receiving them.

Whenever prices are changed, special attention is needed regarding the impacts on people who are very poor. But a question remains on whether it helps impoverished people more if they are induced by low energy prices to continue wasting energy or if they receive direct support payments, leaving them to decide whether to waste energy or save it through efficiency and spend the savings on other things.

When a decision-maker's goal is to create the conditions that facilitate greater resource-productive investments, the estimation of the appropriate level of taxation will

usually need to take into account a wider range of factors rather than the "optimality" of taxation. This can include looking at the role that price has in overcoming barriers to transition and thus taking into account the extent of those barriers, for example, the impact of subsidies on the effective price of a resource, and the other factors creating bias in the economy.

The Republic of Korea now has one of the highest levels of resource and environmental taxation in the region, at roughly 10 per cent of its fiscal revenues, compared with about 6 per cent in European Union countries and 3 per cent in the United States.<sup>21</sup>

### 3.4.3 DECOUPLING AS A CENTRAL POLICY PRIORITY

In response to changes in resource demand, some countries have moved forward with initiatives to foster decoupling. For instance, in its eleventh Five-Year Plan to reach the country's economic goals from 2005 to 2010, the Government of China set a target to improve

its energy efficiency by 20 per cent. The twelfth Five-Year Plan set an additional 16 per cent energy efficiency improvement goal for the period 2011–2015. The Government recognizes the constraints to growth from unchecked resource depletion and has set targets for greater industrial resource efficiency and an economy that operates within the constraints of the changing physical environment.

China's success in increasing energy efficiency demonstrates the importance of setting high-level policy standards. An assessment found that industrial energy efficiency policies collectively accounted for close to 60 per cent of the achieved energy savings from 2006 to 2010. The remaining savings were achieved through autonomous technology improvement and sector-level structural shift.<sup>22</sup> However, China still needs more energy per unit of economic output, compared with many industrialized countries, suggesting room for improvement.<sup>23</sup>

Policymakers can facilitate the widespread uptake of technologies and techniques for decoupling. A wealth of experience is available across the region from policies on innovation, decoupling and the environment that can guide future policy action. Lessons can be learned from some successes, such as with water efficiency. In Australia for instance, GDP rose by 30 per cent and water consumption was reduced in absolute terms by 40 per cent from 2001 to 2009.<sup>24</sup> ♦

## 3.5 INITIATING CHANGE FROM THE BOTTOM: EMERGING NICHES

### 3.5.1 TECHNOLOGIES

As discussed in Chapter 2, resource efficiency must be recognized as an important target for action by science, technological and innovation systems and to high-level policy leadership. This is important for the ongoing development of technology and also for scaling up promising technologies. Supporting a transformative approach to resource efficiency will mean that technologies that are promoted should also meet critical goals in the social and economic dimensions of sustainable development and work towards reducing social inequalities. Improvements in well-being, job creation

for those who most need it and enhancing economic opportunities through resource efficiency should go hand in hand. This focus on sustainable development poses important challenges to the reform of innovation systems.

Research indicates that developing countries could cut their annual energy demand growth by more than half, from 3.4 per cent to 1.4 per cent, over the next 12 years. This would leave energy consumption some 22 per cent lower than it would otherwise have been—an abatement equivalent to the entire energy consumption of China today. The opportunities lie in choosing more energy-efficient cars and appliances, improving insulation in buildings and selecting lower energy-consuming lighting and production technologies. Additional annual investments in energy productivity of \$170 billion through 2020 could cut global energy demand growth by at least half while generating average internal rates of return of 17 per cent.<sup>25</sup> Financial resources saved represent tremendous opportunities for investment in the social sector.

Technologies and techniques that bring significant resource productivity gains are available across a range of resource-consuming activities (Box 3.4). Technology alone, however, may not be sufficient in achieving energy efficiency. The success of Singapore in advancing energy-efficient buildings reflects the importance of establishing resource-use efficiency as an essential social goal (Box 3.5).

The wide range of stakeholders from diverse sectors in the previous examples underlines that there is good potential for action in any development context. This requires carefully defining the sectors and resources that are most critical for action. There is considerable potential for better harnessing stimulating investments and action by stakeholders.

### 3.5.2 SUSTAINABLE URBAN DEVELOPMENT

The issue of resource use is important for both rural and urban populations. This chapter focuses for the most part on urban centres because cities are leverage points in the quest for global sustainability due to their high levels of consumption, production and waste. They consume up to 80 per cent of the global material and energy supply and produce 75 per cent of global carbon emissions.<sup>26</sup>



**Box 3.4**  
**Resource-saving technologies**

There are many technologies related to saving freshwater extraction and use with benefits across the three dimensions (economic, social and environmental) of sustainable development. For instance, farmers in India have shown that sub-surface drip irrigation systems that deliver water directly to crop roots can reduce water use by 30–70 per cent and raise crop yields by 20–90 per cent, depending on the crop.<sup>a</sup> Efficiency savings can be as high as 50–80 per cent and can be made affordable for use in the developing world,<sup>b</sup> with payback periods of less than a year. These low-cost solutions increase incomes of smallholders and were estimated in 2001 to profitably irrigate a tenth of India's cropland, with similar potential for China. India and China, however, only use this kind of technology on just 1–3 per cent of their irrigated land, with China in particular increasing the spread of this technology to arid areas.<sup>c</sup> Where drip irrigation is not appropriate, better water management still delivers benefits. Farmers in Malaysia achieved a 20 per cent increase in their water productivity through a combination of better scheduling their irrigations, shoring up canals and sowing seeds directly in the field rather than transplanting seedlings.<sup>d</sup> Increases in water productivity will also come from agronomic practices and germplasm and substantial investment in upgrading infrastructure.

The Rathkerewwa Desiccated Coconut Industry in Maspota, Sri Lanka reduced 12 per cent of its energy use, 8 per cent of its material use and 68 per cent of its water use while increasing production by 8 per cent by adopting changes in its peeling process, water treatment and fuel switching. The total investment required for those changes was less than \$5,000, resulting in an annual financial return of about \$300,000.<sup>e</sup>

There are some technologies that can directly save electricity in the industrial sector. For instance, electric motors used in China account for around 60 per cent of the country's total electricity consumption. The operational efficiency of these motors is 10–30 per cent below international best practice, depending on the industry. There is generally a low level of awareness of the potential efficiency gains with motors. Some actions are being taken, however. For example, in the second-largest oil field in China, the total power consumption was 7 billion kWh per year, of which 3.11 billion kWh were used by motors. An audit revealed that 14,000 motors were operating with high power consumption and low efficiency, on average, for 7,200 hours per year, revealing an enormous potential for fuel saving.<sup>f</sup> To test the potential for energy and financial savings, several motors were replaced with efficient motors. The output with the new motors was only marginally higher than the previous motors (0.8 per cent higher), but the average power saving rate was 13.2 per cent. This equated to a monthly power saving of 5,910 kWh and annual power savings of 70,920 kWh. The investment cost for these motors was 52,500 yuan (\$7,600), and with the price of electricity at 0.45 yuan per kWh, this resulted in annual savings of 32,600 yuan (\$4,700). The payback period for recovery of the initial investment was 1.6 years. With the estimated service life at 15 years, the life span savings totalled 486,000 yuan (\$70,350). Based on the savings produced in this pilot study, there is potential to save more than 400 million kWh of electricity per year in this oil field.<sup>g</sup>

Another type of technology relates to energy-efficiency. The city of Sydney, for instance, found that one third of its annual electricity use came from public lighting.<sup>h</sup> The city council investigated high-efficiency street lighting technologies to help achieve targeted energy and emissions reductions of 50 per cent. A trial to test the viability of LED street lights found that substantial energy and greenhouse reductions of 40 per cent were possible, which led to a citywide lighting retrofit.<sup>i</sup> The LED lights met appropriate standards and produced high-quality light while reducing electricity consumption and greenhouse gas emissions. The city then undertook a citywide lighting retrofit using LED technologies in combination with lighting controls to allow remote monitoring and control and thus further reduce energy use.

Some technologies can improve fossil fuel productivity in resource-processing industries, suitable for application in developing countries. Research shows that the energy used in methods of Portland cement manufacturing can be reduced by at least 30 per cent globally.<sup>j</sup> However, the greatest reductions would come from the use of aluminosilicate (geopolymer) cement that can reduce the overall greenhouse gas emissions of concrete by 80 per cent, compared with Portland cement,<sup>k</sup> depending on formulation variations, because it requires lower kiln temperatures and has no direct process emissions of carbon dioxide.<sup>l</sup> The World Business Council for Sustainable Development has singled out cement manufacturing as one of six industries on which to focus efforts at reducing energy consumption and greenhouse gas emissions. Once commercialized at larger scale, geopolymer cement should cost less to produce than Portland cement and may have better durability. Other innovative cements that reduce greenhouse gas emissions per tonne by 40 per cent are already in commercial use for construction.

Source: <sup>a</sup> Postel and others, 2001; <sup>b</sup> Shah and Keller, 2002; <sup>c</sup> Brown, 2008; <sup>d</sup> Merican, 2015; <sup>e</sup> von Weizsäcker and others, 2014; <sup>f</sup> Schröder and Tuncer, 2010; <sup>g</sup> von Weizsäcker and others, 2014; <sup>h</sup> City of Sydney, 2014; <sup>i</sup> City of Sydney, 2011; <sup>j</sup> Humphreys and Mahasen, 2002; Kim and Worrell, 2002; <sup>k</sup> Duxson and others, 2007; Duxson, 2008; <sup>l</sup> Davidovits, 2002.



Bringing about global change in levels of consumption and waste output requires a specific focus on cities and their development trajectories. Programmes for resource efficiency in cities have the potential to lower global resource use rates by influencing the development strategies and infrastructure choices they make. This is especially the case where infrastructure is concerned because it strongly influences the material consumption.

Resource-efficient cities combine greater productivity and innovation with lower costs and reduced environmental impacts while providing increased opportunities for consumer choices and sustainable lifestyles. The transition to resource efficiency rests on a range of factors, such as redefining how urban systems are understood at the global level, developing a shared language for evaluating city sustainability and reviewing indices that account for the sustainability of cities.

There is also a strong argument for pursuing resource efficiency in tandem with social and economic goals. The waste-to-resource initiative by ESCAP and partners demonstrates a transformative approach to addressing the solid waste crisis in towns and cities that also brings about social and economic benefits (Box 3.6).

Achieving transformations for resource efficiency in cities requires high-level policy leadership at the city level. In the history of cooperation in this region, many cities have benefited from the opportunity to learn from each other. Scaling up action for resource efficiency in cities requires governance approaches that enable stakeholders (including in local government) to learn about new opportunities and to access financing, knowledge and other resources to take action. In addition, increased capacity to facilitate public participation, as discussed

**Box 3.5**  
Popular support  
for green  
buildings—  
Singapore

Singapore is one of the countries where green building norms have greatly advanced through the collective effort of government, private companies and non-profit organizations (the latter acting through media and community outreach). In just ten years (2005–2015), the number of green buildings in the country increased almost a hundred and fifty times, from 17 to more than 2,500. This translates to more than 70 million square meters or more than 29 per cent of the total gross floor area in Singapore. The latest government green building master plan (2014) aims to intensify efforts to reach the national target of greening 80 per cent of the country's buildings by 2030.

Singapore's success in fostering a green building norm was borne out of a gradual but systematic implementation of initiatives, with strong public sector leadership. In 2005, the Building Construction Authority (BCA) introduced the BCA Green Mark Scheme, a home-grown benchmarking standard that adapts international energy-efficiency practices to the urban tropical environment. While the initial focus was on energy efficiency and water conservation, it has continuously evolved and has incorporated standards related to indoor environments, integration with green spaces and eco-friendly construction materials.

The three green building master plans that the BCA rolled out from 2005 contain a comprehensive suite of financial incentives, legislation, industry training programmes and public outreach campaigns to facilitate the adoption of the Green Mark Scheme. A remarkable feature of the second green building master plan was the emphasis on public sector leadership to spur private sector action through incentive schemes, legislating minimum standards for buildings and a focus on research and development. Opportunity to discuss developers' concerns—such as the dissemination of benefits and the payback period for constructing green buildings—during many green building forums helped to slowly change the mindset of the players in the building industry.

Part of Singapore's success with green buildings reflects mandatory building codes, but it also stems from generally accepted practices.\* Its success also reflects an ethos that a small country must use its limited resources wisely. Green building efforts work best when there is a broad social consensus backing them because the myriad decisions made while constructing and operating each building are ultimately in the hands of various individuals. Governments have a major role by putting in place regulations to instigate change, but their efforts can only succeed if there is an underlying popular consensus that energy-efficient buildings are necessary. Introduced in 2014, the third green building master plan aims to cement this social consensus by rolling out activities towards efficient behaviour that encourages resource use among the occupants of both new and existing buildings.

Note:\*See Clifford, 2015.

Source: Building and Construction Authority, 2015.

in Chapter 2, is critical to support scaling up and the emergence of community action.

### 3.5.3 ECO-LABELLING

Labelling programmes have been developed since the 1970s and have established standards for production processes geared to specific policy outcomes, such as reduced carbon emissions, reduced phosphate levels in effluent water or better working conditions in developing

countries. Eco-labels focus on the environmental impacts of production and use of a class of products and have two purposes: (i) to allow consumers to act on their preferences by providing them with information on characteristics of the products (or services) that are not otherwise apparent and (ii) to educate consumers about resource and environmental issues and thus change their consumption preferences.

For example, Japan's Eco Mark programme aims to contribute to the formulation of a sustainable society

#### Box 3.6 Partnerships and political commitment for waste- to-resource initiatives

A solid waste crisis is emerging in cities and towns across the Asia-Pacific region, fuelled by rising quantities of waste, on the one hand, and poor regulation and management, on the other. Urban populations and economies are growing, and with increasing numbers of people earning and spending more, consumption and waste is swelling. Within this crisis, however, is a significant and largely untapped opportunity for transformative change.

This requires a paradigm shift from end-of-the pipe solutions to waste-to-resource initiatives. Rather than a problem and burden, waste should be seen as a valuable resource that can be managed to produce sustainable benefits for a range of actors. Such a paradigm shift has been promoted by ESCAP and its partners since 2009 through the project Pro-Poor, Sustainable Solid Waste Management in Secondary Cities and Small Towns in the region.

Based on the pioneering model developed by Waste Concern, an NGO from Bangladesh, this project has established integrated resource recovery centres in a number of cities in Bangladesh, Cambodia, Pakistan, Sri Lanka, Viet Nam and in the near future in Indonesia. Integrated resource recovery centres are small-scale, decentralized waste-to-resource facilities that use simple techniques to turn waste into valuable resources, such as recyclable materials, organic fertilizer, biogas, refuse-derived fuel or electricity. In the process, a waste-to-resource initiative can generate a wide array of benefits, such as green job creation, improved health, avoided pollution of land, water and air, reduced greenhouse gas emissions, cost savings from avoided landfilling and improved crop yields through the use of compost.

More than the facilities, however, successful initiatives depend upon the construction of something wider and more enduring: a transformation of behaviour, mindsets and systems for waste management.

Such a transformation requires patience, commitment and sustained outreach and relies upon the establishment of effective partnerships among a range of actors, including local and national governments, communities, social entrepreneurs, NGOs, waste picker collectives and waste collection companies. Social entrepreneurs, NGOs and even communities can be catalysts for change.

But realizing this potential requires government intervention. Waste-to-resource initiatives in developing countries currently face a number of hurdles, including low community awareness, poor financing and cash flow management, poor waste collection, limited engagement of the informal sector and weak regulatory and enforcement systems.

Sustained and transformative solutions depend on a number of factors, such as the separation of waste at source, the effective engagement of communities, and steady and predictable sources of revenue. Governments need to engage communities and promote source separation through long-term programmes, not one-off projects. They need to provide incentives for private sector and social entrepreneurs to engage in waste-to-resource initiatives, including tipping (gate) fees, feed-in tariffs and tax exemptions, while helping create a market for the resources that can be recovered from waste, such as compost.

Source: ESCAP, 2015g.

by promoting consumers' environmentally conscious selection of goods and services and encouraging business enterprises to improve their environmental performance.<sup>27</sup> Similarly, Singapore's Green Label specifically seeks to "promote green consumerism and increase environmental awareness". In a typical eco-labelling programme or scheme, product categories and eco-labelling criteria are determined by a credible independent organization with inputs from scientists, civil society and the private sector.

Eco-labelling schemes can transform specific industries, as has been the case with energy labelling of household appliances, which has essentially eliminated energy-inefficient models from the market in countries like Australia. If scaled up and applied across a wider range of sectors and complemented by more direct action to support private sector investments in resource efficiency, these schemes could potentially shape resource-use paths in specific sectors. In the context of regional economic integration and widening trade responsibilities, eco-labelling schemes coupled with specific investments to support industries in countries with special needs can foster a "race to the top" that enhances the competitiveness of the products from all countries of the region. ♣

## 3.6 CONCLUSIONS

### 3.6.1 REGIONAL COOPERATION

There are subregional and regional efforts and initiatives to enhance resource efficiency, waste and emission prevention that must be brought together with intergovernmental processes that are deepening trade and economic integration ties.

One area of potential action is the establishment of preferential conditions for specific types of goods. The Asia-Pacific Economic Cooperation (APEC) is a forum for 21 Pacific Rim member economies that promotes free trade throughout the region. APEC is also an economic forum supporting sustainable economic growth and prosperity in the region. APEC has established an Environmental Goods List that cites specific goods that are eligible for a favourable tariff due to their potential to improve environmental performance.

The Ten Year Framework of Programmes (10YFP) hosted by UNEP is a global initiative to enhance international cooperation to accelerate a shift towards sustainable consumption and production in both industrialized and developing countries. The framework supports capacity-building and provides access to technical and financial assistance for developing countries. The 10YFP develops and supports the scaling up of sustainable consumption and production and resource-efficiency initiatives at the national and regional levels. A road map for the 10YFP in 2014–2015 was established, which will be renewed in 2016. This process involved national and stakeholder focal points of the 10YFP and was overseen by the UNEP Asia-Pacific office.

Another example is the Asia Pacific Roundtable for Sustainable Consumption and Production, which is a well-established network founded 15 years ago that provides a platform for professionals, business leaders, academics and policymakers to share their views on and experiences with sustainable consumption and production. The roundtable is dedicated to providing a platform for practitioners to work together through innovation, communication and networking to support a transition to sustainable consumption and production. The roundtable is the largest practitioners' network in the Asia-Pacific region for resource efficiency, sustainable consumption and production and waste minimization. The network could be used to reach out to larger communities. The roundtable organizes a regional policy dialogue and conference every 18 months to bring together policymakers and other stakeholders to share good practices and maintain political momentum on sustainable consumption and production.

A variety of programmes exist under auspices of the Association for Southeast Asian Nations and the South Asian Association for Regional Cooperation or South Asia Co-operative Environment Programme. A European Union-funded regional programme, SWITCH-Asia, aims to support the strengthening of sustainable consumption and production policy frameworks through technical and financial policy support and funding for more than 80 pilot projects across the region.

Where regional cooperation and governmental initiatives continue to address environmental degradation and transboundary issues, such as haze pollution, efforts can

be intensified on the commercial fronts to disincentivize unsustainable and irresponsible land and forest clearing. Consumer actions, made through more informed choices, have been known to encourage companies to develop sustainable supply chains. Governments can also take further steps to ensure that their procurement processes take into consideration the sustainable practices of companies and their suppliers. They can also take steps to ensure that investment of companies support sustainable production practices.

### 3.6.2 FINAL CONSIDERATIONS

In short, there are many good examples of high-level policy leadership, initiatives and plans, especially in developing countries in the region that recognize the risk and exposure of their economy to natural resource supply insecurity and climate change. It needs to be seen, however, to what extent countries can escalate their efforts in policy implementation and in evaluating and monitoring the outcomes of their policies.

The five-year planning process that is a central feature in the development process in many Asian and Pacific developing countries offers opportunities to coordinate efforts for harmonizing economic growth and environmental outcomes. The economic development plan is usually managed by a government agency responsible for the

national planning process in collaboration with line ministries. The national development plans often refer to environmental objectives in separate dedicated chapters. In many circumstances, the development objectives are not harmonized with environmental goals. Especially in a situation of rapid economic growth, the issues of resource efficiency, sustainable consumption and production and equitable distribution of wealth need to be integrated into economic development objectives to avoid excessive pressure upon the environment and natural resources and to reduce inequalities.

While there are good examples of local innovations, they must be scaled up and become the standard. This will require the development of more widespread and effective partnerships between the private sector and civil society and communities to expand the opportunities for action on resource efficiency at both regional and national levels. The notion of corporate social responsibility should shift towards partnership approaches. Greater challenges to accountability need to be placed at the feet of the private sector.

Governments must support the development of effective alliances of stakeholders and create the enabling conditions and incentives to align the interests of these different stakeholders with action on resource efficiency. If implemented together, transformations for a more resource-efficient region will emerge. 🌱

## ENDNOTES

- 1 Afghanistan, Australia, Bangladesh, Bhutan, Cambodia, China, Democratic People's Republic of Korea, Fiji, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand and Viet Nam.
- 2 UNEP, 2010a.
- 3 Millennium Ecosystem Assessment, 2005.
- 4 See the 2030 Agenda for Sustainable Development.
- 5 UNEP, 2011 and Smith and others, 2010.
- 6 Schandl, H. and others, 2015.
- 7 Ibid.
- 8 Ibid.
- 9 Ibid.
- 10 Ibid.
- 11 Fogarty, 2015.
- 12 Center for International Forestry Research, 2015.
- 13 Quah and Siong, 2015.
- 14 Schandl, H. and others, 2015.
- 15 Ibid.
- 16 Ibid.
- 17 Ibid.
- 18 Ekins and Speck, 2011; OECD, 2010b; Cour des Comptes, 2011; Jaeger, 2011.
- 19 UNEP, 2004; UNEP and ECLAC, 2003.
- 20 These are: (i) limit total water use by strict demand management; (ii) achieve higher water use efficiency in industry and agriculture; and (iii) improve water quality by a cap on pollution loading within water functional zones.
- 21 UNEP, 2014.
- 22 Yuqing and others, 2014.
- 23 Von Weizsacker, 2009.
- 24 Smith and others, 2010.
- 25 McKinsey Global Institute, 2008.
- 26 Swilling, M., and others, 2013.
- 27 The Eco Mark Office, Japan Environmental Association. Available from [www.ecomark.jp/about/](http://www.ecomark.jp/about/).







# 4

## TRANSFORMATION FOR SOCIAL JUSTICE

### KEY MESSAGES

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Transparent and accountable governments, responsible businesses and engaged civil societies are needed for social justice transformation that will support trade and economic integration efforts that are more inclusive and equitable. Social justice transformation is also needed to create inclusive and competitive urban and rural environments and inclusive access to basic resources and services.

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Wide disparities across the region—between the rich and poor, between those living in urban and rural areas and between the sexes—exist in relation to income and access to food, water and energy.

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Addressing inequitable development outcomes requires changing the inequitable processes that produced them. Initiatives to redress these inequalities are emerging, including community-based management of natural resources, corporate and civil society partnerships and participatory budgeting.

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Governments can create the enabling conditions to accelerate existing and emerging efforts and thus trigger transformation that redresses inequalities by translating international commitments into national frameworks and laws, enlarging opportunity for multistakeholder participation and promoting access to information and more equitable flows of investment.

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## 4.1 INTRODUCTION

A principle of the 2030 Agenda is that no one should be left behind. This principle is the theme for the 2016 High-level Political Forum on Sustainable Development, a sign of global commitment to a development agenda that benefits all people.

This is particularly relevant to the Asia-Pacific region, where income inequality has worsened. Nearly three out of four people in Asia and the Pacific are living in countries in which income inequality has increased or remained unchanged over the past 15 years. At the same time, the share of total income received by the poorest 20 per cent of people has decreased.<sup>1</sup> Increasing economic inequalities, coupled with persistent social inequalities, shape the degree of inclusiveness and equity in people's access to natural resources that are necessary to meet their basic human needs. Inequalities in access to natural resources reinforce economic and social inequalities.

This chapter first looks at the state of inequalities in access to critical natural resources and then reflects on the relationships between access to natural resources and economic and social inequalities. Although inequalities are viewed mainly through an environmental lens, the solutions cannot be environmental alone. The chapter proposes three target areas for interventions that can promote more inclusive societies and economies: (i) fulfilment of basic rights; (ii) decision-making processes that are more inclusive and equitable; and (iii) inequalities in outcomes. This chapter is relevant to countries for which advancing equality is critical for achieving SDG 10 and as a means to achieving other targets. ♣

## 4.2 SOCIAL JUSTICE AND THE SUSTAINABLE DEVELOPMENT GOALS

Sustainable development is grounded in social justice. It is integral to addressing structural poverty, the unfair distribution of resources, unequal access to opportunities, shortcomings in respect to fundamental human rights and the protection of vulnerable and disadvantaged people.<sup>2,3</sup>

There are varying views on what constitutes socially just, or fair, distribution of goods and resources. Amartya Sen and Martha Nussbaum's capability approach is a widely accepted basis for policy response that highlights the multidimensions of poverty and the critical role of the State in ensuring that individuals establish basic capabilities to do things that they value and have the freedom to choose between different ways of leading their lives.<sup>4,5</sup>

The aspiration for a more equitable society is reflected in the 2030 Agenda. Several SDG targets aim to ensure universal access to basic needs and services that derive from natural resources. These targets include access to safe, nutritious and sufficient food (target 2.1), safe and affordable drinking water (target 6.1) and affordable, reliable and modern energy services (target 7.1). Target 2.3 aims at equal access to land and natural resources in general. SDG 14, which aims to conserve and sustainably use the oceans, seas and marine resources, dedicates one target to small-scale artisanal fishers' access to marine resources and markets (target 14.b). SDG 15 on protecting, restoring and promoting sustainable use of terrestrial ecosystems, sustainably managing forests, combating desertification and halting and reversing land degradation and halting biodiversity loss includes a target on fair and equitable sharing of the benefits arising from the use of genetic resources and promoting appropriate access to such resources (target 15.6).

The 2030 Agenda also highlights the importance of gender equity in access to natural resources. SDG target 5.a promotes equal access to ownership and control over land and natural resources and target 5.c promotes policies to reinforce gender equality. SDG 4 underpins these gender equality goals on inclusive and equitable quality education and lifelong learning opportunities for all. More broadly, equality among individuals is expressed through the aspiration to reduce inequality within and between countries, for instance, in terms of outcomes of justice in target 10.3 and in regards to social protection and fiscal policy in target 10.4.

Reducing income inequality is an indispensable component of poverty reduction. A study covering 125 countries found that one third of the fall in poverty came from greater equality.<sup>6</sup> There are also studies indicating that highly unequal societies—economically, socially and environmentally—are less successful in sustaining growth, slower in recovering from economic downturns and more susceptible to political instability and violence that arise

from people's frustration due to inequalities and disparities.<sup>7, 8, 9, 10</sup>

The 2030 Agenda's pledge of leaving no one behind and its vision of universal human dignity speaks of the necessity for action to protect human rights and the importance of accountability, participation, equality and non-discrimination. ✦

## 4.3 SOCIAL JUSTICE AND ENVIRONMENTAL SUSTAINABILITY IN THE ASIA-PACIFIC REGION

### 4.3.1 OVERVIEW—DRIVERS AND OUTLOOK

Although people's access to water, food and energy has improved over time in most of the countries in the region, there are inequalities between rich and poor, urban and rural populations, and men and women in which the poor, the rural and women generally have less access, ownership and control.

In understanding the unequal access to natural resources, it is useful to examine what drives different dimensions of inequality. For instance, urbanization is a major driving force of widening income gaps.<sup>11</sup> It creates a modern commercial sector, marked by high productivity and incomes, typically alongside a traditional subsistence sector, marked by low productivity, incomes and investments.<sup>12</sup> Inequality is not exclusively a rural-urban phenomenon, however. As the *State of Asian and Pacific Cities 2015* report highlights, "Cities are home to concentrated poverty, growing inequality, social exclusion and inequitable service provision."<sup>13</sup> As more and more people live in cities, ensuring that the drivers of inequality are addressed is critical to achieving sustainable development in the region.

The degree to which urbanization impacts inequality varies.<sup>14</sup> A study in 2014 that examined data from the 1990s to the late 2000s found that urbanization contributed 300 per cent of the increase in inequality at the national level in the Philippines and contributed more than 50 per cent of the increase in inequality in Indonesia and slightly less than 15 per cent in India. The same study also indicated that the increasing urban population had helped *reduce* inequality

in China, where rising rural inequality accounted for 43 per cent of inequality at the national level.<sup>15</sup>

Trade integration could potentially be a driving force for income inequality in the region. A study in 2014 on Asia's intraregional trade found that intraregional imports contributed to increasing income inequality within countries, while intraregional exports contributed to narrowing income inequality within countries.<sup>16</sup> Regional trade integration is generally considered beneficial to countries, though to varying degrees. If human rights are not respected, economic integration could contribute to further deterioration of the environment via relaxation of regulations that result in pollution havens, loss of biodiversity and a race to the bottom, in which competition encourages businesses to prefer locations with lower wages and weaker environmental standards and law enforcement capacity. The increase in capabilities and diversification expected from trade integration has so far been limited to a small number of countries in the region (see Chapter 5).

Impacts of environmental degradation, such as air pollution and climate change, affect individuals and societies differently and often disproportionately. The manifestation of climate change as floods, droughts, cyclones and sea level rise disproportionately affects people who are poor because their livelihoods are sensitive to climate and because they often lack the means to protect themselves or cope with the impacts. The damages to livelihoods brought about by frequent and sudden-onset disasters, such as storms and floods, are on the policy agenda for many countries because of their visibility. But there are also slow-onset climate change impacts, such as drought and sea level rise, that do not get as much attention. In the Pacific countries, and also in Viet Nam and Bangladesh, sea level rise, higher waves and stronger winds have caused coastal erosion and salinization of the arable land, leading to lower agricultural yields.<sup>17</sup> Both types of damage deprive coastal populations of their livelihoods.

When Typhoon Haiyan stormed the central Philippines and killed more than 6,000 people, it was the landless who were hardest hit. Many of them did not evacuate to safer areas despite the warning because they feared that they would not be allowed to return home. In other developing countries, many rural families do not have secure land rights and thus do not have the motivation to invest in building climate-resilient houses. The landless tend to have the most difficulty recovering from the impacts of disaster.<sup>18</sup>

### 4.3.2 STATE OF ACCESS TO FOOD, WATER AND ENERGY

The Universal Declaration of Human Rights and multiple human rights agreements affirm the entitlement of everyone to adequate food,<sup>19</sup> and some nations explicitly recognize the right to adequate food in their constitution.<sup>20</sup> In 2010, the United Nations General Assembly declared access to clean water and sanitation a human right.<sup>21</sup>

While access to energy is not formally recognized as a human right, it is a critical input to meeting basic needs. For example, producing and cooking adequate food and preparing clean drinking water require energy. Energy also enables the provision of health care services, education and information. The Millennium Development Goals (MDGs) included human beings' physiological needs for food and water through Goals 1 and 7 on eradication of extreme poverty and hunger and environmental sustainability, respectively. The goal of ensuring access to affordable, reliable, sustainable and modern energy for all was introduced in the 2030 Agenda.

There are great differences in the prevalence of hunger across the Asia-Pacific subregions. The MDG target on hunger was reached in Central Asia, East Asia and South-East Asia due to rapid economic growth; South Asia and the Pacific did not reach the goal.<sup>22</sup> In South Asia alone, there are approximately 281 million people who still lack access to affordable and nutritious food.<sup>23</sup> The Pacific countries have about 1.4 million people with precarious access to affordable nutrition<sup>24</sup> due to increasing dependence on imported food and frequent natural and human-caused disasters that affect the availability of staple food and result in volatility of food prices.

In the region, a total of 277 million people, of which 138 million live in South and South-West Asia, lacked access to safe drinking water in 2015, despite significant progress towards increased access to drinking water.

Equitable access to water for women can empower them economically if water is used productively. Yet, women's limited access to and ownership of land leads to their lack of access to water.

Affordable energy is needed not only to achieve economic growth but also to meet basic human needs. In the region, 455 million people did not have access to electricity in

2012, and the rural areas accounted for the majority of this access deficit (see Figure C5 in the Statistical Annex). Around 1.8 billion people still rely on traditional fuels for cooking and heating.<sup>25</sup> In most of the countries that have not reached universal electrification, the rate of electrification in urban areas exceeds that of the rural areas. In Cambodia and Myanmar, the rate of rural electrification was below 20 per cent in 2012, while in urban areas it was 97 per cent and 60 per cent, respectively.<sup>26</sup>

With their dependence on imported petroleum to meet energy needs, the Pacific countries are among the most vulnerable in the region to energy poverty. Similar to water, access to energy and efficient use of energy is determined by income. Poor households often have a limited range of opportunities to convert energy to productive use because the technologies that are available to them are often of low quality and inefficient, such as candles and kerosene lamps.

With the growing demand for food and energy as well as rising water supply uncertainty, the interdependency and links between and among water, food and energy resources have become more pronounced than ever. Competing demands for natural resource endowments, such as land for food and renewable energy production, also continue to intensify. Because water, food and energy resource supply and demand are deeply connected, sustainable management of these resources requires consideration in tandem. Institutional capacity to detect and address trade-offs in the use of natural resources needs to be built up. Economic strategies to meet the growing demand for energy should not constrain the capacity of poor households to meet their food and water needs. And meeting the increasing urban demand for water should not undermine the capacity of rural agricultural users to meet their own demands.

### 4.3.3 ACCESS TO LAND

Access to land largely determines rural people's access to basic needs, such as water and food.<sup>27</sup> Secure access to land is critical, especially for the rural poor who are more likely not to meet their basic needs without it. Insecure land tenure, which is typical in many developing countries, is a contributing factor to low productivity—farmers have no incentive to invest in land without long-term land security. The unequal distribution of land is one of the reasons for social disparity and is a contributor to domestic conflicts. Worldwide, land is under increasing pressure due to various

#### Box 4.1 What determines access to food?

Access to food is often discussed in the greater context of food security,<sup>a</sup> which encompasses availability, stability and utilization of food in addition to access. The Food and Agriculture Organization of the United Nations' food security indicator measures access to food using such variables as the domestic food price index, the prevalence of undernourishment, the share of food expenditure among people who are poor, the depth of the food deficit, the prevalence of food inadequacy and road density, among others. In Asia, most of these indicators improved over the past five years. Nonetheless, disparities in access among countries and within countries should not be ignored.

Access to food is largely determined by income in places where people purchase food. Thus, there is invariably a disparity in access to food between the rich and the poor. Although poverty reduction achieved in the past decade in the region contributed towards improving access to food, especially for the rural poor,<sup>b</sup> the region is still home to 490 million people who lack access to a sufficient supply of dietary energy to live a healthy life.<sup>c</sup>

Access to productive land, especially for the rural population, is also an important determinant of access to food. Access to land (as well as control and ownership) is not equal between men and women. Women usually have less access to land and lack access to fertilizer and tools. Households headed by females tend to become less food secure.

Access to food is also determined by location and, to some extent, access to roads. It is a problem especially for people living in mountains, remote areas and small islands where local agricultural production is inadequate and transporting food from outside is physically difficult due to lack of transportation and financially difficult due to high prices. Because many of the people in remote places are ethnic minorities and indigenous people, they account for a large portion of the region's poor and hungry population.<sup>d</sup>

Source: <sup>a</sup> Food security is defined as "when all people at all times have physical and economic access to sufficient, safe, nutritious food" by the World Food Summit in 1996; <sup>b</sup> FAO, 2015; <sup>c</sup> FAO, 2015; <sup>d</sup> FAO, 2015.

factors, including population growth, climate change and land degradation.

Because people who are poor, especially women, tend to have weak and unprotected land rights, they are the most vulnerable to the increasing pressures. In many of the region's developing countries, land ownership is largely determined by customary or non-formal tenure and provided as a social right. Land rights are often unequally distributed between men and women. For example, in 2015 the share of agricultural land owned by women was only 10.1 per cent in Bangladesh, 14.3 per cent in Tajikistan and 15.4 per cent in Viet Nam.<sup>28</sup> The quality of the land as well as equipment available to women tends to be lower than what men can access. Women also have limited or no access to valuable extension services and cannot easily acquire loans or purchase inputs. These factors usually result in lower yields for women farmers and, consequently, the persistence of poverty and inequality.

Land grabbing is a threat to land security of people in developing countries. Land grabbing refers to "land deals that happen without the free, prior and informed consent of communities that often result in farmers being forced from their homes and families left hungry".<sup>29</sup> The deals can be national or international for any purpose—road construction, commercial real estate development or

agricultural investment. Conflicts over land issues have occurred in Cambodia, Indonesia and the Philippines, among others.<sup>30</sup> Disputes over land sometimes lead to human rights violations of the poor and marginalized, including indigenous people, whose customary rights to land are not recognized by many States, but it also applies to the growing number of the region's urban poor living in informal housing without security of tenure.

### 4.3.4 ACCESS TO AND SUSTAINABLE USE OF OCEANS, SEAS AND MARINE RESOURCES

Fisheries are an important source of income and food for many impoverished people around the world; SDG target 14.b speaks to the access of small-scale artisanal fishers to marine resources and markets. Conservation and sustainable use of oceans, seas and marine resources at large are captured in SDG 14. To realize this goal, a legal framework called the United Nations Convention on the Law of the Sea was suggested under target 14.c. Most of the region's countries have ratified the Convention but it has not been followed through thoroughly in some countries due to lack of capabilities and human resources in the ocean sector, among other reasons.<sup>31</sup>

Follow-through on the Convention is urgently needed for sustainable use of the resources—conflicts prevail over access rights, and ocean, sea and marine resources suffer pressure from unsustainable human activity, including overfishing, unregulated illegal fishing, pollution and invasion of alien species.

Ocean acidification and climate change have also impacted marine biodiversity. In the past decades, the world's fisheries have been increasingly exploited. Fish stocks have been declining worldwide (see Figure A8 in the statistical annex). Among the assessed fish stock in the ocean, only 9.9 per cent is underfished, while 61.3 per cent is fully fished (fully exploited)<sup>32</sup> and 28.8 per cent is fished at a biologically unsustainable level (overexploited). Depleted fish stocks have negative impact on small-scale fishers. In some countries, especially in South-East Asia, small-scale fishers are among the poorest occupational groups, and fisheries is, in most cases, their main source of income and food.

Fishers in the Asia-Pacific region catch more than half of the fish caught in the world.<sup>33</sup> The demand for fish is expected to grow worldwide, and FAO predicts that Asia will be leading the increase in demand.<sup>34</sup> While this presents an enormous economic opportunity, a framework that affirms environmental sustainability and human rights is desperately needed. Reports of “sea slavery” in Thailand describe the trafficking of poor people from northern Thailand and neighbouring countries to fishing boats, some held for years, to catch fish that is often eventually sold for pet food or food for livestock.<sup>35, 36</sup>

#### 4.3.5 ACCESS TO AND SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS (FOREST AND BIODIVERSITY)

Forests are home to most of the region's terrestrial biodiversity. The region's rich biodiversity, however, remains under threat—almost half of the world's 35 biodiversity hotspots are located here.<sup>37</sup> Forests also provide important ecosystem services and a source of livelihoods for many, especially poor, marginalized and indigenous groups.

Various conventions and treaties concerning terrestrial ecosystems exist. Among them is the Convention on Biological Diversity, which has been ratified by most of the region's countries. In 2014, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity entered into force. This is an important protocol in advancing efforts towards SDG target 15.6, which aims to “ensure fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources”. Seven countries<sup>38</sup> in the region have become signatories, while 11 countries<sup>39</sup> have either ratified or acceded to the protocol.<sup>40</sup>

Men receive more socioeconomic benefits from formal employment in the forestry sector than women;<sup>41</sup> although not much data are available beyond formal employment in the forestry sector. Forestry provides firewood for energy and cooking, and both men and women collect firewood, though men tend to sell firewood for income while women tend to use firewood for subsistence purposes.<sup>42</sup>

It is difficult to make a general statement about the ownership of forests in the region because of the range of prevailing arrangements. Overall, ownership has evolved over the past decade in many countries. In some countries, the portion of the forests designated for and owned by local communities and indigenous peoples has increased (from 2002 to 2013), and the portion owned by governments has decreased.<sup>43</sup>

Significant changes have been reported in Bhutan, Cambodia and Thailand.<sup>44</sup> In these countries, the government used to administer entire forests but have designated some forests to indigenous people and local communities for their management. Community rights to forested land are relatively strong in Bangladesh, China, Nepal, Papua New Guinea, the Philippines and Viet Nam—where the constitution or civil code protects communities' tenure rights to forestland.<sup>45</sup>

In India, Nepal and the Philippines, the area of forest owned by indigenous people and local communities has increased significantly and now accounts for one third of the entire forest land. However, the portion of the land allocated to local or indigenous communities in some countries is of low quality—the forests had already been cut down when it was handed to them.<sup>46</sup> 🌿



## 4.4 LEADING FROM THE TOP: STRUCTURAL CHANGES TOWARDS TRANSFORMATION FOR SOCIAL JUSTICE

### 4.4.1 OPPORTUNITIES AND BARRIERS

How can the region redress the inequalities?

To begin, decision-making processes to determine people's access to natural resources need to transform, from being characterized by exclusion, excessive politicization and lack of transparency to a process in which multiple stakeholders' interests and knowledge are sought out through engagement. Political decision-making processes often reflect social and economic inequalities, with certain groups of a population, such as ethnic minorities, women, youth and the poor, typically excluded from decision-making on resources that concern their lives.

Lack of stakeholder engagement in decision-making entrenches inequality and reduces the impact of high-level policy initiatives. Where stakeholder engagement and delegation of responsibilities to stakeholders has occurred, positive changes have been observed—such as reduced pollution, increased investment and more sustainable natural resource management.

Opportunities for such transformation exist. Some countries in the region have civil society organizations working towards inclusive and sustainable development and contributing to decision-making on the sustainable and equitable use of natural resources. Other successful grass-roots initiatives have led to increased participation in decision-making. But there are also challenges, such as governance deficits that manifest in lack of coordination and cooperation across different line ministries and corruption in the management of natural resources.

Governments can lead a transformation for more socially just societies from the top by putting appropriate policies in place. This section proposes three macro policy changes that can support the more equitable distribution of access to natural resources: (i) protection and promotion of human rights; (ii) addressing inequalities in the “process”, in line with SDG target 16.7, which aims to ensure responsive, inclusive, participatory and representative decision-making

at all levels; and (iii) direct interventions for short-term action on inequality in “outcome”.

These structural approaches could provide enabling conditions for scaling up three niches, or bottom-up approaches, that can support the inclusiveness of regional economic and trade integration, urbanization and service provision at the local level related to community-based management of natural resources, scrutiny of supply chains and participatory budgeting, for example.

### 4.4.2 TRANSLATING INTERNATIONAL COMMITMENTS INTO NATIONAL FRAMEWORKS AND LAWS THAT ADHERE TO THE PRINCIPLES OF HUMAN RIGHTS

The foundation for advancing equality in responding to basic needs is strong adherence to international conventions on human rights, in particular the ten core international human rights instruments.<sup>47</sup> Most of the region's countries have ratified these conventions, although the degree to which they are translated into national frameworks varies.

In addition, people's rights to development and a healthy environment should also be recognized. The translation of such rights into national policies is necessary for sustainable development and providing equal access to basic services and natural resources. People's right to a healthy environment is acknowledged in the Stockholm Declaration (1972), the Hague Declaration on the Environment (1989) and the Declaration of Bizkaia on the Right to the Environment (1999).

Access to information, participation and justice is one of the important principles in the Rio Declaration on Environment and Development (1992) and the Future We Want (2012) and should be translated into national policies and governance structures. This principle introduces accountability, transparency and democratic decision-making to sustainable development governance and helps empower people. Efforts in India, where a Right to Information Act has been introduced, and in Bangladesh, where information mechanisms are being made available to the general population, have reported positive development results.<sup>48</sup>

The Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in

Environmental Matters is one of the most comprehensive efforts to implement the principle of access to information, participation and justice.<sup>49</sup>

The principle of free, prior and informed consent, which refers to the rights of local communities, particularly indigenous people, to participate in decision-making about issues impacting them, is included in article 10 of the United Nations Declaration on the Rights of Indigenous Peoples. Local communities, particularly indigenous people, tend to rely on forests and marine resources yet are often discriminated against and excluded from the decision-making processes on the use of these resources. In the region, where environmental conflicts and displacement that arise from lack of consultation with local communities are prevalent, adherence to this principle is particularly important.

Translating these principles and commitments into national frameworks does not automatically guarantee that people's human rights are protected; but it is an important step towards ensuring human rights protection as a basis for advancement towards sustainable development. This is also in line with SDG target 16.6 that aims for effective, accountable and transparent institutions at all levels and SDG target 16.b that aims for the enforcement of non-discriminatory laws and policies for sustainable development.

#### 4.4.3 ENLARGING SPACES FOR MULTISTAKEHOLDER PARTICIPATION

Participation of various stakeholders in decision-making, particularly those who are underrepresented, as spelled out in SDG target 16.7, provides the opportunity for diversity of viewpoints in the sustainable development process, enhances the implementation of decisions and builds trust among stakeholders, all of which will support long-term collaborative relationships. Because social and economic inequality is often reflected in political representation, enlarging a space for stakeholder participation is an opportunity for the poor, women, indigenous people and others to have their opinions heard on decisions that impact their lives.

National multistakeholder mechanisms exist in various countries of the region,<sup>50</sup> although the term “multistakeholder”

is loosely defined as non-state actors. “Lack of institutional and financial frameworks, mechanisms for effective consultations and incorporation of stakeholders' inputs into long-term planning” have been the major bottlenecks in implementing multistakeholder participation in national sustainable development processes;<sup>51</sup> specific institutional mechanisms for engagement with various sectors of society, in line with Agenda 21, are needed.

Translating stakeholder participation into fair decisions requires attention to common factors that lead to successful cases. This requires a philosophy that encourages empowerment, equity, trust and learning as a basis for promoting stakeholder participation. That philosophy manifests as engagement with multistakeholders in early stages and throughout a process, assessing their needs and representing those needs systematically, informing them of the participatory process and reaching consensus on decisions, adapting to local contexts, having skilled facilitators and institutionalizing participation.<sup>52</sup>

Local and scientific knowledge should inform stakeholder consultations.<sup>53</sup> Building trust between government officials and stakeholders is a major challenge, often impeded by lack of enthusiasm and commitment to the participatory approach among government officials or corruption.<sup>54</sup>

#### 4.4.4. EQUITABLE INVESTMENT POLICIES

Governments can facilitate increased response to basic needs by channelling the flow of investments into rural development and towards poor and marginalized communities. In many countries, rural areas are home to the majority of the poor yet receive less investment than their urban counterparts. For example, an ADB report estimated that total expenditure for rural development in Cambodia ranged from 1.4 per cent to 1.9 per cent between 2006 and 2010.<sup>55</sup> The line ministries that support rural development are among the most underfunded ones. Ministries of agriculture, forestry and fisheries, water resources, meteorology and rural development lack qualified staff to deliver services in rural areas, which leads to reduced economic opportunities for the rural poor. Agriculture, which supports the lives of many rural poor households, receives only a small fraction of public investment—on average, only 2.6 per cent of total government expenditure since 2000.<sup>56</sup>

Studies show that investments in rural infrastructure, such as roads, irrigation and electrification, have significantly contributed to poverty reduction in many parts of the region.<sup>57</sup> Roads facilitate mobility and access to markets; they open opportunities and encourage empowerment. Road construction has improved the wages and employment of people who are poor. Electricity expands access to technology and contributes directly to increased employment and incomes. Irrigation, made possible by rural electrification, has boosted agricultural productivity, which also increases income and reduces income inequality.<sup>58</sup>

Studies from India and the Philippines indicate that rural infrastructure investment is more effective when combined with investment in education. Land reform, development of rural institutions, rural financial services, rural non-farm enterprises and certain subsidies should be combined to advance rural development in a holistic manner.<sup>59</sup>

Urban areas are also under tremendous pressure to provide for the needs of a growing global population. Where and how much to invest in the urban-rural landscape must be carefully decided within national and local contexts.

Governments can create enabling environments in which private investments support inclusive and sustainable development. A first step is to encourage the private sector to disclose accurate information on their sustainability practices to the public so that investors and consumers can make investment decisions and purchasing actions based on that information.

Investing in the power sector, especially in the poorest countries, is not often considered an attractive proposition by the private sector.<sup>60</sup> Partnerships between the public sector, private sector and local communities is one way to boost investments for rural development. As the pro-poor public-private partnership project by ESCAP demonstrates, collaboration allows the sharing of investment costs, responsibilities, risks and rewards, which thus encourages more high-risk and high-cost investments to rural communities, where basic services are often not adequately provided (Box 4.2).

Privatizing access to basic services has not been without problems. Opponents of water privatization claim that it undermines the basic human right of access to water by increasing fees and reducing service for remote areas

where delivery is considered non-profitable. Privatization of basic service provision must be carefully considered from a human rights perspective<sup>61</sup> so that it results in expanding access—not contracting it.

In Metro Manila, Philippines, the provision of water services is divided into two service areas. In the area where the private concessionaire did not require legal property title for installing new taps, there has been particular success in providing near-universal tap water connections at a lower price and with better service, despite population growth. This decision by the private company removed a major barrier to service delivery and enabled impoverished communities to access improved water.<sup>62</sup> 🍀

## 4.5 INITIATING CHANGE FROM THE BOTTOM: EMERGING NICHES

Macro policy changes provide enabling conditions for scaling up good practices, or niches, as proposed in Chapter 2. The following highlights three such niches that, if scaled up, could support transformations in social justice conditions in the region in the context of urbanization and economic and trade integration processes: (i) community-based management of natural resources, (ii) scrutiny of supply chains based on access to information and (iii) participatory budgeting.

### 4.5.1 COMMUNITY-BASED MANAGEMENT OF NATURAL RESOURCES

Community-based natural resource management is a niche for environmental and social justice transformation because it can help expand access to natural resources for people who are poor and who tend to rely on them for livelihoods and food security. Community management of natural resources is also a way of engaging stakeholders in decision-making on the matters that impact their lives. It empowers communities with rights and responsibility to sustainably manage their resources.

In the past few decades, community management has proven effective in many parts of the region. In the early days of the concept, analysts assumed that community management would fail because self-interests would lead to the depletion of natural resources.<sup>63</sup> On the contrary,

**Box 4.2**  
Promoting  
private sector  
participation to  
enhance rural  
energy access

ESCAP has pioneered an innovative strategy for rural development by widening access to energy services through private sector investment in small-scale renewable energy-based electrification projects.

The Pro-Poor Public-Private Partnership (5P) Approach builds upon traditional public-private collaboration to support governments in ensuring energy access to rural communities with private sector financial and technical resources. The 5P approach involves redefining the role of energy project stakeholders and focuses on community participation and ownership. The 5P approach uses locally available resources to develop sustainable and technologically innovative energy services for off-grid communities.

Where 5P differs from the prevailing models of private sector engagement is the long-term commitment of the investor, adding not only financial sustainability but technological relevance to project operation. Under the 5P model, the private sector jointly invests in community-based power utilities with a government. The utility benefits from the resourceful spirit and technical expertise of the private sector, a useful element often absent from grant-based projects. Community ownership provides efficiency and sustainability in the operational aspects of the project.

The 5P model attempts to fill the gap between profit-oriented public-private partnerships and socially oriented grant-based projects. As with any investment, the private sector will ultimately be motivated by financial attractiveness. The model does not exclude grant or other public funding. Participation of the private sector in rural electrification actually allows for public sector funds to benefit from the novel implementation approaches the private sector brings to projects.

In Dubung, Nepal, for instance, an 18 kWh solar PV micro grid has been fitted with technology allowing for the utility to be remotely monitored from a private company's office in Kathmandu. This reduces the risk of long-term technology failure, which affects many projects, and allows the company to expand its project portfolio to reach a larger population while ensuring the necessary oversight.

Rural energy projects are perceived as high-risk investments. Although the cost of renewable energy technology is decreasing, investors are typically confronted with high up-front capital costs, coupled with the prospect of low rates of return. One of the many examples of potential policy support mechanisms emerging through the 5P approach in Nepal is access to finance. Although the private sector partner was willing to assume the low-rate-of-return risk, the investment climate was not conducive for accessing long-term, low-interest financing, which resulted in the project becoming financially dependent upon grants. Because a 5P rural electrification project needs to consider operational and maintenance costs along with the prospect of a return on investment, a short-term debt repayment schedule with a high interest rate would not be financially sustainable.

Developing appropriate policy support mechanisms is essential in creating an environment in which the private sector can assume larger portions of funding, thus reducing the grant component of financing and inject the necessary innovation to propel rural electrification projects to the most remote communities in the region.

More information on the 5P approach can be found at [www.unescap.org/5P](http://www.unescap.org/5P).

Source: Project monitoring visits carried out by ESCAP Energy Security Section in November 2015.

when certain conditions are in place, communities manage their natural resources sustainably. Community-based forestry management, for example, is practised in wide geographic areas in Cambodia, India, Indonesia, Nepal, the Philippines and Viet Nam.

The practice is relatively high in the Philippines, Nepal and India, where almost 37 per cent, 30 per cent and 28 per cent of forests, respectively, are community managed.<sup>64</sup> Nepal is considered a successful case of community-based forestry management. When forestry management was delegated to local communities, usage became more sustainable. Community management helped overcome the constraints

faced by various government levels when they had the management duty (including lack of administration and capacity to monitor illegal logging). When communities take ownership in managing the natural resources for their benefit, their practices tend to reflect awareness of long-term consequences.<sup>65</sup>

Bangladesh and a number of Pacific countries practise community-based management of inland fisheries and marine resources. In Bangladesh, poor households used to have limited access to lakes and ponds because that opportunity went to the highest bidders through annual auctions. When an International Fund for Agricultural

Development-led project gave the security of long-term leases to fisher groups, their confidence to invest in the lakes increased and resulted in sustainable use of the resources.<sup>66</sup>

Nonetheless, examination of various cases of community management of natural resources indicates the practice needs to be carefully designed so that all stakeholders are included. Governments can support this practice by investing in strengthening its own capacity as a facilitator rather than carrying on its conventional role as a monitor. Communities can better monitor due to their proximity.<sup>67</sup>

Community-based adaptation to climate change (CBA) and ecosystem-based adaptation to climate change (EBA) are gaining momentum, such as in Bangladesh and Nepal.<sup>68</sup> CBA is based on communities' priorities, needs, knowledge and capacities to plan for and cope with the impacts of climate change<sup>69</sup> and includes the most vulnerable populations. EBA uses biodiversity and ecosystem services as part of an overall adaptation strategy.<sup>70</sup> Both approaches are people-centred with strong community and participatory components that can be integrated into existing frameworks to support community-based natural resource management.<sup>71</sup>

## 4.5.2 SOCIAL JUSTICE IN THE SUPPLY CHAIN

Global supply chains are increasingly under scrutiny by civil society. Government initiatives to promote access to information can respond to this increased scrutiny.

Fair trade is a good example of a partnership that can improve supply chains. The business model of fair trade has potential to break the race to the bottom commonly associated with global trade, wherein unfair companies seek lower wages and weaker environmental standards and law enforcement to reduce their production costs.

Fair trade is often supported by civil society organizations and consumers who make ethical consumption decisions. The results of fair trade are evident among small-scale producers in developing countries, such as coffee and tea producers in rural communities. The successful cases demonstrate that they are paid fairer wages because they produce higher-quality products, work in safer conditions and engage in democratic decision-making. They now have direct access to markets and know how to manage their ecosystem with more sustainable farming methods. With

increased wages, farmers can choose to send their children to school, build hospitals and improve public services in their communities.

Fair trade is often promoted through partnerships between companies and civil society, together with local producers, such as farmers and artisans. The alignment of interests is what makes fair trade viable. For companies, the main incentive to partner with NGOs is enhanced brand or corporate reputation and credibility. Long-term stability and impact and innovation are also high among their motives. For NGOs, the primary motivation is access to funds, long-term stability, impacts of programme delivery and access to networks of expertise and skills.<sup>72</sup> Partnership also helps corporate accountability and transparency.

Access to information has a critical role in the fair trade model. Facilitating consumers' access to information can be a powerful tool for governments to improve the global supply chain.

Consumer actions, made through more informed choices and popularized by organized NGO effort, have produced some successful cases in encouraging companies to develop sustainable supply chains. In 2015 following media and NGO reports, for instance, a global food company committed to eliminating forced labour in its seafood supply chain and to report on its progress every year.<sup>73</sup> Governments should ensure that their own procurement processes take into consideration the sustainable practices of companies and their suppliers, particularly in the case of goods that are highly extractive (timber, minerals).

Open access to information is the basis for promoting this practice, including specific information-based policy interventions, such as eco-labelling. Strengthened analytical capacity is needed to strategically target these types of interventions: Input-output analysis can reveal hidden environmental and social impacts related to trade. A 2012 study by Lenzen and others, for instance, found that the major part of biodiversity losses can be attributed to international trade in just a few products.<sup>74</sup>

## 4.5.3 PARTICIPATORY BUDGETING

Participatory budgeting is a direct-democracy approach to budgeting whereby citizens are offered opportunities to deliberate and influence the allocation of public resources.



**Box 4.3**  
Participatory  
budgeting

Participatory budgeting traces its origins to Porto Alegre, Brazil in the 1980s and has now been adapted in many parts of Asia and the Pacific. Local authorities that have taken up participatory budgeting include Naga City, Philippines; Ichikawa, Japan; Pune (in Maharashtra State) and Kerala State, India; Tanah Datar and Surakarta, Indonesia; Sirajganj, Bangladesh; Huai Kapi, Rayong, Khon Kaen and Suan Mon in Thailand; Heathcote District of New South Wales, Australia; Fiji and some other Pacific countries; and 244 municipalities in the Republic of Korea—among others.<sup>a</sup>

The style and the degree of citizen participation vary. In some cases in the Philippines, citizens are involved in consultations in planning on prioritizing issues but cannot be involved in decision-making on budgets. In Pune, India, citizens have a say in the allocation of a certain portion of the budget.<sup>b</sup> In some municipalities in the Republic of Korea, consultations are held in steps and the breadth of participation differs with each step. In India, Indonesia and the Republic of Korea, online participation has been adopted to make use of the internet and other tools.

Source: <sup>a</sup> See the participatory budgeting map at [www.google.com/maps/d/viewer?mid=zVzhqoSAoelE.kA0oNs8llhwo](http://www.google.com/maps/d/viewer?mid=zVzhqoSAoelE.kA0oNs8llhwo); Um, 2015; <sup>b</sup> Development Central. <https://developmentcentral.wordpress.com/2013/07/02/participatory-budgeting-in-india-the-pune-experiment/>.

Participatory budgeting requires spaces for multistakeholder engagement, and it has great potential to drive the more equitable flow of investment.

There are a growing number of successful participatory budgeting practices in the region.<sup>75</sup> Participation, for example, has strengthened citizens' voices, improved their participation in decision-making, improved local responsiveness to citizens' preferences, increased accountability of public officials and elected representatives and even fostered greater trust in government in some cases.

Some participatory budgeting processes have been driven by civil society organizations while others were driven by governments. The World Bank, the ADB and other donors also have supported the introduction of participatory budgeting in some countries.

Among the success factors, first comes central and local government officials' willingness to listen to citizens' needs and preferences and then take action to deliver the requested services. Second, legal, institutional and policy frameworks for participation are in place. Third, the nature of the formal and informal political systems is such that politics is not based on patronage or identity but is strongly related to policy issues. Fourth, decentralization frameworks exist, with local autonomy, meaningful-sized budgets and spaces for interventions and a clear division of roles and responsibilities that incentivize citizens to participate in the process. Fifth, the budgeting reflects the results of the planning process to ensure that citizens'

priorities are covered. Finally, the capacity of citizens to participate is strong.<sup>76</sup>

It is important to keep in mind the potential shortcomings of participatory budgeting. Depending on the effectiveness of the process, participants and their intentions, the participatory process can become undemocratic, exclusive and be used to advance certain groups' interests, leading to injustice. The process can be manipulated to foster injustice by depriving the opinions of certain groups and depriving the marginalized from participating. It can override the legitimate decision-making process if manipulated by facilitators. Participatory budgeting thus must be carefully pursued while recognizing the local political and social power dynamics. Designing a participatory budgeting process needs to consider how to ensure increased and broad participation with balanced representation of citizens' interests by putting the appropriate incentives in place.<sup>77</sup> ♦

## 4.6 CONCLUSIONS

The proposed top-down changes in tandem with support for emerging niches can be the driving force of social and environmental justice transformation. Together, they can catalyse transformation for equal access to natural resources in the context of the regional megatrends discussed in Chapter 1. The underlying factors that support successful implementation of these top-down and bottom-up actions include governance capacities, stakeholder engagement and partnership, and regional cooperation.



#### Box 4.4 Participatory budgeting in the Republic of Korea

The Republic of Korea is among the most advanced in Asian countries in terms of participatory budgeting. The concept was implemented nationwide in 2011 and as of January 2015, 244 local governments were practising participatory budgeting. All citizens can participate in proposal making at the first stage, while groups of delegates participate in later stages. Technology is used to involve citizens through internet surveys, online bidding, cyber forums and online bulletin boards in addition to public hearings and seminars. In Dong-Ku and Buk-gu districts, those who participate in the participatory budgeting must first take part in training through a “participatory budgeting school”. In many municipalities, the budget for social development sector increased after participatory budgeting was introduced.

Source: Um, 2015.

### 4.6.1 GOVERNANCE CAPACITIES

Implementation of the proposals included here requires strong governance capacities, both at the central and local levels. Decentralization of governance is one way to strengthen governance capacities to respond to the needs of people who are poor and vulnerable and to improve their well-being. Decentralization can work favourably for stakeholder engagement because it allows decision-making to reflect local needs and contexts.<sup>78, 79</sup> For decentralized governance to be fully responsive and representational, people and institutions at all levels need to be empowered.<sup>80</sup>

The empowerment of local governments needs to be supported by the central government’s strong commitments to decentralization, accountability and transparency. Institutional arrangements for participatory approaches (such as participatory budgeting and community-based natural resource management) and staff capacity are needed at both the local and central levels. Capacity to conduct proper planning, implementation, monitoring and evaluation and to create a feedback loop to adapt new approaches is also important.

### 4.6.2 STAKEHOLDER ENGAGEMENT AND PARTNERSHIP

Partnerships can catalyse social justice transformation. As the examples in this chapter highlight, partnerships between companies and civil society organizations (such as fair trade), local governments and local stakeholders (such as community-based natural resource management and participatory budgeting) and local governments and companies (such as water privatization) have proven effective at addressing inequalities and delivering basic services. Governments need to provide the enabling conditions for partnerships by ensuring accountability and transparency

and ensuring that decisions and priorities reflect the local context.

Engaging stakeholders in decision-making is both the means and ends of social justice transformation. Governments need to set up the necessary institutions for multistakeholder partnership and create conditions to allow stakeholders to engage in decision-making. For citizens, private companies and other stakeholders to participate in decision-making processes, certain conditions should be met. For example, stakeholders must be aware of the issues to discuss and the existence of institutions that allow their participation in decision-making. They also need information to make appropriate decisions. Stakeholders also must be granted freedom of speech without being suppressed by authorities.

### 4.6.3 REGIONAL COOPERATION AND INTEGRATION

Regional cooperation can be a platform for sharing knowledge, experiences and good practices. It can be used to discuss and consider regional-scale implementation of certain principles that are environmentally, socially and ethically stringent, such as free, prior and informed consent. In cases involving transboundary natural resource management issues, discussions among all countries involved are necessary.

Regional dialogues, coordination and cooperation can help avoid greater inequality and deprivation of access to basic services by people who are poor, unskilled or marginalized as an unintended consequence of a regional initiative. For example, trade integration agreements in the region should ensure that communities are not displaced and that investment decisions do not degrade natural resources that rural households depend upon. Increased investments in education and training are needed to ensure that workers

can access the opportunities that may be created by trade integration and/or can adapt to changes that it may trigger.

#### 4.6.4 EMERGING AREAS FOR RESEARCH

Lack of disaggregated data was a major challenge in developing this chapter. Disaggregated data are important because averages obscure critical information on inequality among different population groups. For example, there is insufficient sex- and age-disaggregated data on hunger and malnutrition in the region. To follow through with the 2030 Agenda, disaggregated data (sex, age, geographical location, economic status and disability, for example) will be critical to determine problems and assess progress towards the SDGs. In addition, capacity to gather, analyse, report and disseminate disaggregated data is important for governments to better understand their realities and create more tailored solutions. 🌱

#### ENDNOTES

- 1 ESCAP, 2016. As measured by the Gini index or the Palma ratio.
- 2 National Pro Bono Resource Center, 2011.
- 3 Newell, 2005.
- 4 Sen, 2008.
- 5 Wells, n.d.
- 6 Ravillion, 2013.
- 7 UN System Task Team, 2012.
- 8 Berg and Ostry, 2011.
- 9 Chaudhuri and Ravallion, 2006.
- 10 Ibid.
- 11 Kanbur and Zhuang, 2013.
- 12 ESCAP, 2015.
- 13 UN-Habitat and ESCAP, 2015.
- 14 Ibid.
- 15 Kanbur, Rhee and Zhuang, 2014.
- 16 Thi, 2014.
- 17 Liz, 2007; White and Falkland, 2010.
- 18 Hanstad and Prosterman, 2014.
- 19 Article 25.1 of the Universal Declaration of Human Rights states, “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.”
- 20 FAO Right to Food around the Globe database, n.d. Available from [www.fao.org/right-to-food-around-the-globe/en/](http://www.fao.org/right-to-food-around-the-globe/en/).
- 21 United Nations General Assembly Resolution 64/292.
- 22 United Nations, 2015.
- 23 Ibid.
- 24 Estimate by FAO in *State of Food Insecurity in the World*, 2015.
- 25 Sustainable Energy for All.
- 26 International Energy Agency, 2014.
- 27 In many places, land and property tenure determines people’s access to basic needs, such as water, energy and food.
- 28 See FAO Gender and Land Rights Database.
- 29 See Oxfam America, 2015.
- 30 See Radio Free Asia.
- 31 United Nations Office of Legal Affairs, 2014.
- 32 FAO, 2014a.
- 33 While the largest producers in the region were China, Indonesia, Russia Federation and Japan in 2012, the largest exporters were China, Thailand and Viet Nam.
- 34 World Bank, 2013.
- 35 Urbina, 2015.
- 36 IOM, 2011.

- 37 Hot spots in the region are Caucasus, Irano-Anatolian, Mountains of Central Asia, Eastern Himalaya, Western Ghats and Sri Lanka, the mountains of South-West China, Indo-Burma, Sundaland, Wallacea, South-West Australia, Forests of East Australia, the Philippines, Japan, Polynesia-Micronesia, East Melanesian Islands, New Caledonia and New Zealand.
- 38 Australia, Bangladesh, Cambodia, Japan, Palau, Republic of Korea and Thailand.
- 39 Bhutan, Fiji, India, Indonesia, Lao People's Democratic Republic, Micronesia (Federated States of), Mongolia, Myanmar, Samoa, Vanuatu and Viet Nam.
- 40 UNEP and CBD, 2015.
- 41 Terrestrial ecosystems, such as forests, have important socioeconomic values to many rural poor households. The socioeconomic benefits from forests come from consumption of forest goods and services. Forests also provides firewood for energy for many rural poor households, both formal and informal employment and shelter. Forests also purify water and contribute to food security and health.
- 42 FAO, 2014a.
- 43 Center for People and Forests, 2013.
- 44 Ibid.
- 45 Ibid.
- 46 Gené and others, 2012.
- 47 The ten core international human rights agreements are International Convention on the Elimination of All Forms of Racial Discrimination (1965), International Covenant on Civil and Political Rights (1966), International Covenant on Economic, Social and Cultural Rights (1966), Convention on the Elimination of All Forms of Discrimination Against Women (1979), Convention Against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (1984), Convention on the Rights of the Child (1989), International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (1990), International Convention for the Protection of All Persons from Enforced Disappearance (2006), Convention on the Rights of Peoples with Disabilities (2006), and Optional Protocol to the Covenant on Economic, Social and Cultural Rights (2008).
- 48 Consumer Unity and Trust Society International, 2010.
- 49 The Aarhus Convention is a regional convention in Europe that came into effect in 2001 and was referred to by former United Nations Secretary-General Kofi Annan as "the most ambitious venture in the area of environmental democracy so far undertaken under the auspices of the United Nations". Among ESCAP member States, Armenia, Georgia and Kazakhstan ratified it, while Azerbaijan, Kyrgyzstan, Tajikistan and Turkmenistan acceded to the convention as of January 2015.
- 50 Antonio, Ofei-Manu and Olsen, 2014.
- 51 Antonio, Ofei-Manu and Olsen, 2014.
- 52 See the work of and standards promoted by the International Association for Public Participation, [www.iap2.org/](http://www.iap2.org/).
- 53 Read, 2008.
- 54 Rahman, 2015.
- 55 According to the ADB report *Rural Development for Cambodia: Key Issues and Constraints* (2012), the data may not be entirely accurate due to difficulty in data availability and collection.
- 56 ADB, 2012.
- 57 Ali and Pernia, 2003.
- 58 Llanto, 2012.
- 59 Fernando, 2008.
- 60 Hansen and Nygaard, 2013.
- 61 Tujan, 2008.
- 62 Clifford, 2015.
- 63 Hardin, 1968; Hardin, 1982.
- 64 Gené and others, 2012.
- 65 Bollier and Helfrich, 2014.
- 66 IFAD, 2006.
- 67 Gené and others, 2012.
- 68 Reid, 2015.
- 69 Reid, 2009.
- 70 UN Convention on Biological Diversity.
- 71 Reid, 2015.
- 72 See the Corporate-NGO Partnership Barometer 2014: The Partnering Agenda Grows Deeper Roots, [www.candeadvisory.com/sites/default/files/Headline\\_Findings\\_Barometer\\_2014.pdf](http://www.candeadvisory.com/sites/default/files/Headline_Findings_Barometer_2014.pdf).
- 73 Associated Press, 2015.
- 74 Lenzen and others, 2012.
- 75 Shah, 2007.
- 76 Ibid.
- 77 Ibid.
- 78 Catacutan and Tanui, 2007.
- 79 Shimelis and Donoso, 2015.
- 80 UNDP, 2004.





# 5

## ECONOMIC STRUCTURE TRANSFORMATION

### KEY MESSAGES

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Many of the economies in the region are undergoing economic transformation in a context of severe environmental constraints related to climate change, land use change and resource availability.

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Economic transformation is required to achieve the Sustainable Development Goals. The most urgent actions needed: increase the productive capacities of developing countries; foster sustainable consumption and production; keep within the planetary limits to improve economic resilience; and reduce income inequalities.

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Aligning the regional megatrends, such as economic integration, with sustainable development requires: structural changes in the incentive framework to get the prices “right”; long-term investments in sustainable development; low-carbon economic infrastructure; and strengthening the transformative capacity of economies. Emerging niches, such as renewable energy and innovative business models, present strong potential for supporting economic structural transformation.

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As economic structures and required skills change, investments in education to ensure that everybody can adapt are needed to deliver an economic structural transformation that is fair.

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## 5.1 INTRODUCTION

Structural transformation is an important dimension of economic development. The concept, however, is sometimes restricted to “the reallocation of economic activity across the broad sectors of agriculture, manufacturing and services”.<sup>1</sup> But the phenomenon is multidimensional, including a reallocation of resources across products within sectors and across geographical areas as well as changes in the technology of production and social changes. This large-scale transfer of resources away from the least productive economic activities to more productive ones<sup>2</sup> is driven by two dynamics: (i) the rise of new activities (diversification) and (ii) the movement of resources from traditional activities to newer ones.<sup>3</sup>

Thus, the process of economic structural transformation is both an important driver and a result of the regional megatrends. Regional economic integration processes must create enabling conditions through market incentives, regulations and investment policy to promote consumption and production patterns, investments in natural capital, infrastructure choices, employment opportunities, human capital formation and technological changes that are in line with sustainable development.

Many countries in the region, most notably China, the Republic of Korea and Viet Nam, are experiencing economic structural changes. The capacity to change the structure of the economy is a necessary condition for a country to achieve the SDGs, but it is not sufficient on its own. Because basic human needs remain unmet and several planetary boundaries have already been breached, more fundamental economic structural transformation will be needed to avoid the negative consequences of business-as-usual practices.

### 5.1.1 AN ENVIRONMENTALLY SUSTAINABLE ECONOMY AND THE SUSTAINABLE DEVELOPMENT GOALS

Most of the SDGs require action for sustainable economic development: in SDG 2 on hunger, food security and sustainable agriculture; in SDG 7 on reliable modern and sustainable energy; in SDG 9 on sustainable industrialization; in SDG 11 on cities; and in SDG 12 on sustainable consumption and production.

Economic transformation should first increase the productive capacities of developing countries, which can occur through shifts in economic activity across sectors, but must also increase productivity in a sustainable way in all sectors. Second, it must contribute to moving away from unsustainable production and consumption patterns, such as by improving resource efficiency and decoupling economic growth from environmental degradation and resource use. Third, it must keep environmental impacts within the planetary limits and improve economic resilience. Finally, wealth must be shared throughout a society and income inequalities reduced. The transformation towards a more equitable economy must be based on decent work for all, particularly for women and young people, and on investment in a healthy and well-educated workforce for their productive employment and active participation in society.

The SDGs are global in nature and universally applicable,<sup>4</sup> but the differences in national realities, capacities and levels of development will influence the priorities of national and local governments when it comes to interpreting and contextualizing the goals and targets. Thus the challenge of economic structural transformation for sustainable development is that of dual convergence.

Dual convergence means that, on the one hand, developing countries in the region need to increase their productive capacities and towards industrialized country standards of living to achieve broad-based improvements in human well-being. Simultaneously, they should promote sustainable production and consumption patterns that avoid the unsustainable level of resource use that currently characterizes many richer economies.

On the other hand, industrialized economies have achieved high standards of living through consumption and production patterns that are not replicable for the global population because of the untenable environmental pressures associated with them. Hence, they should undertake rapid reductions of their environmental footprint to keep within planetary limits. However, they should do so while consolidating the standards of living achieved in past decades. ♦



## 5.2 GREENING ECONOMIC STRUCTURES IN THE ASIA-PACIFIC REGION

### 5.2.1 OVERVIEW—DRIVERS, OUTLOOK AND IMPLICATIONS

Using the economic structural changes experienced by industrialized countries and some advanced developing countries in the region as a reference, an ADB study<sup>5</sup> derived five features of economic transformation:

- i) Reallocation of the factors of production across sectors of different productivity, in particular, a shift of labour from agriculture to industry and then to services.
- ii) Diversification, upgrading and deepening of the production and export baskets. Economic development is associated with the production of an expanding range of goods and services, increasingly interconnected and higher on the technological ladder.
- iii) Use of new production methods and processes and different inputs. The economic structural transformation includes changes in the technology of production affecting the quantity and combination of inputs used to produce outputs.
- iv) Simultaneously, economies experience a broad geographical restructuring that leads to an acceleration of urbanization as labour moves from agriculture in rural areas to more concentrated activities in industry and services in urban areas.
- v) This process is accompanied by social changes, such as a broader participation of the workforce in market activities, changes in consumer behaviour or institutional changes.

Analytical evidence from past transitions,<sup>6</sup> indicates that economic structural changes experienced by developing countries translate into higher incomes, greater wealth and improved living conditions. However, the context (in terms of opportunities, constraints and the balance of power) faced by countries undergoing economic transformations today is drastically different from

the context during previous processes of structural transformation.

Countries in the early stages of structural change are confronted with challenges specific to structural change itself but also the challenges of unachieved demographic transition<sup>7</sup> and its consequences on employment—in the context of a globalized economy with its huge asymmetries in productivity and competitiveness. This new context generates advantages over previous experience (the possibility to reap the benefits of past experience and technological progress and the opportunity to access global markets) but also new constraints (increased and more asymmetric international competition).<sup>8</sup> While the past transformations took place in a context of relative natural capital abundance, future transformations must be carried out within environmental constraints; in particular, climate change and competition for resources that require countries to both mitigate and adapt to the consequences of environmental degradation and scarcity.

Change needs to be managed across various dimensions. The new context requires developing economies to follow a pathway to development that will bring about quality of life improvements for all people while keeping within the planetary limits. In industrialized economies, a structural transformation towards a sustainable economy, decreasing drastically the environmental footprint while consolidating standards of living, is also necessary to achieve the sustainable development outcomes.

Urbanization is an opportunity to promote living standards and resource efficiency gains through economies of scale, efficiency gains and information sharing. It is also a major challenge. Urbanization and infrastructure choices can lock countries into a vicious cycle of urban sprawl, unmet needs and unsustainable resource use patterns, which then increases the risk of urban poverty, inequalities, congestion, pollution and lack of affordability (such as housing). The negative impact of urban activities on human health, the environment and the global climate system, are already of particular concern.

Hence, urbanization processes will be important in the quality of structure transformation in a country and its contribution to sustainable development. Today's developed economies have all experienced simultaneous urbanization and GDP growth. Urbanization is associated with the sectoral shift from agriculture to industry and

services, higher productivity, higher income overall and the rise of the consuming class (driving demand). Based on analyses of data from more than 200 countries, Box 2.5 in Chapter 2 highlights how rates of urbanization are correlated with carbon emissions rather than wealth (GDP per capita). The urbanization rate in the region has increased from less than 20 per cent in 1950 to 48 per cent in 2015 and is projected to reach around 64 per cent in 2050.<sup>9</sup>

Inclusive and sustainable urbanization provides important opportunities for economic structure transformation, particularly for countries in which cities have become the primary node of economic growth and wealth creation.<sup>10</sup>

## 5.2.2 SECTORAL SHIFTS

The evolution of the relative importance of the broad sectors of agriculture, industry and services is the most obvious evidence of the economic structure change taking place in the region's economies.<sup>11</sup> Increased productivity, the perception of greater opportunities together with decreasing agricultural land per worker and a larger share of the population focused on fragile lands<sup>12</sup> are driving the transfer of labour from agriculture—still representing 35 per cent of total employment in the region—to other sectors (see Figure D1 in the Statistical Annex).

The manufacturing sector has not been able to absorb all surplus labour. Most countries in the region have not industrialized, and industry's share in total value added has declined.<sup>13</sup> Labour-saving technological changes and increased competition for markets and resources from more advanced developing economies explain this “premature deindustrialization”.<sup>14</sup> It is an important challenge for developing economies because the transfer of low-skilled labour from agriculture to faster-growing and higher-productivity jobs in the production of tradable goods in the formal manufacturing sector was a decisive driver of growth and economic convergence in the past.

Labour typically has been flowing from agriculture to services but not necessarily to higher-productivity activities. High-productivity services tend to be skill intensive, and other services are usually non-tradable and thus constrained by the growth of income. This is particularly true in least developed countries, where the transfer of labour from low-productivity agriculture to

low-productivity services in urban areas is threatening to become the rule, contributing to informal sector expansion and the working poor phenomenon.<sup>15</sup>

Developing economies need to discover new development patterns that are less reliant on sectoral shifts and external demand. In many of the region's economies, productivity growth is already coming more from within sectors than from the reallocation of labour across sectors.<sup>16</sup> Sectoral shifts will accompany the transformation towards sustainable development in developing countries but most likely as a by-product of production diversification, upgrading and deepening.

## 5.2.3 DIVERSIFICATION

Economic development is associated with the production of an expanding range of goods and services. Producing new products requires increasing the number of productive capabilities available in an economy. Economies with a large set of capabilities, in turn, generate inter- and intra-industry spillovers that increase the competitiveness of each connected firm. Diversification of production is also a mechanism of diffusion of technical progress, with the production upgrading towards more complex products and services.<sup>17</sup> Finally, more diversified economies have a higher built-in capacity to evolve, adapt to changes and self-organize to continue functioning in times of crises. They are not only more dynamic, they are also more resilient.<sup>18</sup>

The degree of diversification varies widely across the region's economies. Some of the so-called newly industrialized economies and some other East Asian economies have experienced a significant diversification, deepening and upgrading of their production and exports. In many other countries, the diversity of the production and exports basket remains low. Because economic development is associated with increasing diversity of economic activities, producing more of the same product will not sustain growth, thus resulting in a degraded natural base without bringing about structural transformation and increased productive capacities.

Developing countries in the early stage of structural transformation can take advantage of new opportunities to access global markets.<sup>19</sup> However, increased trade integration has been accompanied by increased

capabilities and diversification into more complex activities in a few countries only. In a context of increased international competition (in particular, from the big emerging economies) for markets but also for resources, strategic diversification approaches, nudging the private sector towards targeted economic activities that are more likely to increase the productive capabilities in a country, are necessary.

Carefully designed industrial and trade policies can shield nascent local industries against competition when appropriate and shape diversification processes towards economic structures that create more added value and are more job intensive, are more eco-efficient and allow for enhanced quality of life.<sup>20</sup> With environmental scarcity and ecosystem degradation becoming aggravated, the green sector, including integrated technologies and adapted goods, will increasingly provide most of the opportunities for diversification. This is particularly true in least developed countries, where the transformation towards sustainable development often implies the continuation and even expansion of existing sustainable practices, but also in industrialized economies, where structural transformations and growth are also dependent on the generation of new dynamic activities.

#### 5.2.4 CHANGES IN PRODUCTION METHODS AND PROCESSES

Technical progress—the transformation of the technology of production and of the methods and processes with which the different inputs are combined and transformed during the production process—is the main source of productivity growth, which is the single most important determinant of a country's living standard in the long run.<sup>21</sup> The region has experienced unequal but dramatic increases in labour productivity over the past few decades that have translated into higher income and living standards for many.

Labour productivity figures, however, can give a misleading picture of the efficiency of an economic system.<sup>22</sup> The high-resource intensity of the region's economic growth<sup>23</sup> suggests that extensive substitutions of largely unaccounted natural resources (in particular, energy) for human labour have had an important role in productivity growth.<sup>24</sup> Natural capital-intensive productivity growth may have a positive influence on income but can also

result in rising environmental pressures that degrade the natural basis on which the region's prosperity depends. All things being equal and apart from eventual localized and temporary competitiveness gains, the replacement of labour for natural resources reduces the capacity of an economy to create jobs, which then increases inequality and impedes broad-based improvements in human well-being.<sup>25</sup>

Labour productivity increases do not necessarily translate into quality-of-life improvements. People's quality of life depends on the quantity and quality of final services, including ecosystem services, they consume. However, labour productivity can increase without changes in the quality and value of final services available: First, productivity growth can reflect the monetization of activities formerly not counted because they were conducted outside the market economy (such as child care or wastewater treatment). Second, more goods produced do not imply more or better final services provided. For instance, people buy cars mainly for the transport service they provide, but more cars do not imply improved transport services. A great number of cars increase congestion, but not all people benefit.

Thus, economic structural transformation must include a shift towards processes and methods of production that increase eco-efficiency. It must consider the contribution to human well-being made by non-market activities. This requires changes in the incentive framework. In particular, it must contend with various market failures—coordination failures, public goods and externalities—that distort prices and generate incentives towards resource-intensive technologies and unsustainable consumption patterns.

Economic structural transformation will require ensuring that priorities are based on a broad consensus and that all stakeholders—especially the most vulnerable—are engaged in a participatory decision-making process. The market is not the only mechanism to allocate resources, but even when it is most efficient, the market must be subordinated to democratic decisions. Creating and strengthening markets is not an end in itself and offers just one means of enhancing the welfare of citizens across the region.

## 5.2.5 SOCIAL CHANGES

The transformation of an economy's structure, such as rural-urban migration and the move from scattered to more concentrated activities, is also accompanied by important, numerous and varied social changes.<sup>26</sup> The continued rise of the consuming class (one of the region's megatrends) will have strong influence on sustainable development outcomes. The economic growth of the past decades and the accompanying increase in labour productivity have resulted in higher income and purchasing power, giving rise to the rapid expansion of the consuming class, despite widening the gap between the rich and poor and increasing the concentration of wealth among the rich.

Provided there are suitable distribution policies, higher income could be an opportunity for broad-based living standard improvements in the region. The replication of the unsustainable consumption patterns prevailing in industrialized economies, however, could have disastrous consequences on the environment and the quality of life. Yet, the limitation of environmental resources (ecosystem services) will impede the generalization of industrialized economies' consumption patterns, thus excluding the majority from accessing higher living standards and resulting in increased inequality.

Shifting to sustainable consumption and production patterns with increasing resource efficiency at all stages of product life cycles will be necessary to generate better quality of life while minimizing natural resource use and staying within the planetary limits. This will require sustainable lifestyles and a culture of sufficiency. Equitable access to ecosystem services, equitable distribution of profits from the exploitation of natural resources as well as attention to social justice regarding the burdens of environmental degradation are essential components of wealth sharing, equitable income distribution and inequality reduction. ♣

## 5.3 LEADING FROM THE TOP: STRUCTURAL CHANGES FOR AN ENVIRONMENTALLY SUSTAINABLE ECONOMY

Aligning the region's megatrends with sustainable development outcomes requires the elimination of two barriers: (i) the gap between market prices and the real cost of natural resource use as well as ecosystem services; and (ii) the time gap between short-term costs and long-term benefits of sustainable options, which creates a bias for short-term resource-intensive investments.

### 5.3.1 REFORMING THE INCENTIVES FRAMEWORK

A common target for sustainable development policy is the market failures that undervalue the societal costs of environmental degradation and limit investment in natural capital. In economies largely relying on markets, price is a strong driver for change and the efficient allocation of resources. Getting the price right through Pigovian<sup>27</sup> taxation or cap-and-trade approaches can help remedy market failures. Well-designed environmental tax reform, shifting the burden of taxes from tax on labour to environment-damaging activities while controlling for regressive distribution impacts can bring about a double dividend: reducing environmental damage and increasing employment and output (Box 5.1). A number of countries in the region have started such reforms to their policy frameworks (Box 5.2).

Payment for ecosystem services (PES) is another tool to internalize the value of ecosystem services in economic decisions. By valuing ecosystem services that are normally omitted from GDP calculation, PES schemes offer economic incentives to foster more efficient and sustainable use of ecosystem services.<sup>28</sup> The essential characteristic of PES schemes is the focus on maintaining a flow of a specified service—such as clean water, biodiversity habitat or carbon sequestration capabilities—in exchange for something of economic value.

There are good examples of PES schemes in the region. For example in Viet Nam, the PES scheme has reportedly reduced the incidence of illegal logging by 50 per cent within a short time. Payments for ecosystem services must

be adapted to each country and community situation, and the design should ensure that communities are not disenfranchised (Chapter 6 discusses PES as a source of financing for sustainable development).

Environmental conditional cash transfers, which are cash payments that are dependent on investments in or protection of environmental capital, can promote sustainable development while compensating the people affected by new policies.<sup>29</sup> The allocation of enforceable property rights—private but also common—is an alternative option. Many South-East Asian countries have adopted community-based approaches to forest and fisheries management, based on properly monitored and locally enforced shared property rights.

The internalization of environmental costs does not guarantee that development outcomes will align with societal objectives, however. In case of multiple and persistent market failures, introducing command and control instruments, such as a legal ban, standards or a cap, are also viable options.

### 5.3.2 FINANCIAL SYSTEMS

Long-term investment is necessary to support the long-term policy horizons of sustainable development. It also produces a higher rate of return, reduces instability and is more favourable to productive investment, such as infrastructure or green activities, leading to sustainable growth. But long-term investment is affected by the time-gap problem. For example, renewable energy could improve rural electrification in the region while allowing energy savings, promoting inclusive growth, improving energy security and lowering harmful emissions. But the upfront costs to develop the required infrastructure are high, and investors' behaviour is showing signs of a growing short-term bias. These signs include declining investments' holding periods or portfolio reallocation in favour of hedge funds or high frequency trading.

Redirecting financial systems towards long-term greener investment requires government intervention. The region has experienced tremendous growth in investment assets and can use its history in policy-directed lending and investing to re-orient investments towards long-term green investment. The range of policies and instruments that can help overcome the lack of funding in long-term

#### Box 5.1 Shifting tax from productive activities to resource use

British Columbia—the first territory in North America to adopt an economy-wide carbon tax (in 2008)—offers a compelling example of the benefits of lowering the tax on investment and employment while increasing the tax on carbon use. The reduction of fuel use in the territory by as much as 16 per cent in the first five years of the carbon tax has been largely attributed to this shift. Fuel efficiency has also improved by 19 per cent, compared with the rest of Canada, proving that carbon price can indeed change behaviour. Researchers also found that the tax has not hurt the economy.

Source : Stevie Elgie interview with Diane Tommey, How British Columbia gained by putting a price on carbon. Yale Environment 360. Available from [http://e360.yale.edu/feature/how\\_british\\_columbia\\_gained\\_by\\_putting\\_a\\_price\\_on\\_carbon/2870/](http://e360.yale.edu/feature/how_british_columbia_gained_by_putting_a_price_on_carbon/2870/).

green investments can be grouped into three categories: (i) feed-in tariffs or Clean Development Mechanisms aimed at increasing project revenues, (ii) tax credits or capital grants that reduce project costs and (iii) concessional loans to decrease capital costs.

Long-term green investments, which can involve new and decentralized technologies, may benefit from the development of such specific mechanisms as green bonds or funds (see Chapter 6).

### 5.3.3 ECONOMIC INFRASTRUCTURE

Infrastructure has a significant role in economic development. With the region urbanizing rapidly and a range of infrastructure needs remaining unmet (in transport, energy, sanitation and housing), most of the region's countries are or will soon be building the bulk of their infrastructure, which has implications for energy consumption. The International Energy Agency (2010) projects that in India, for instance, 75 per cent of buildings expected to exist in 2030 have yet to be built. India's pattern of resource use in 2030 will largely depend on how these buildings are built. The density, location or insulation of the buildings, for instance, will directly influence the quantity of energy needed for transport, heating and cooling. Given its long life



**Box 5.2**  
Recent policy  
framework  
reforms in the  
Asia-Pacific  
region

### ENVIRONMENTAL TAX

Environmental taxes shift the tax burden from traditional taxes to taxes on activities that have a detrimental impact on the environment. Environmental taxes internalize the negative external environmental and social costs, which are usually not reflected in the market price.<sup>a</sup> Revenue neutrality ensures that tax revenues are used to reduce existing taxes or are returned to the public.

Environmental taxes have been adopted by a number of countries to achieve green policy objectives and drive green businesses. Taxation measures can take the form of incentives or penalties. Examples include the fossil fuel tax and renewable energy incentives in Japan, where the green tax policy is balanced between incentives and penalties. The Republic of Korea is more inclined towards incentives; it is among the most active countries in the world to encourage green innovation.<sup>b</sup>

Environmental taxation reform is not confined to the industrialized Asia-Pacific region. Viet Nam introduced an Environmental Tax Law in 2012. Consumption tax is levied on coal, refined fuels and environment-harming substances. The tax has a potential to reduce Viet Nam's annual carbon emissions by up to 7.5 per cent. With the proposed tax rate on coal significantly lower than on refined fuels, however, the measure may unintentionally result in the substitution of cleaner refined fuels with dirtier coal.<sup>c</sup>

### CARBON PRICING

Similar to the environment tax, carbon pricing takes into account negative externalities. A price can be put on carbon through a carbon tax or a carbon market. A carbon tax fixes the price of carbon emissions and lets the quantity fluctuate, whereas a carbon market fixes the quantity of carbon emissions and lets the price fluctuate. Revenues collected from a carbon tax can be used to reduce traditional taxes or are returned to the public, making the carbon tax revenue-neutral.<sup>d</sup> Australia and Japan introduced a carbon tax in 2012, at \$24 per tonne of CO<sub>2</sub>e and \$4 per tonne of CO<sub>2</sub>e, respectively. The Australian Government repealed the carbon tax in July 2014, justifying that it would reduce the cost of utilities and consequently the cost of living, lower the ongoing compliance costs and boost economic growth.<sup>e</sup>

Carbon taxes adopted in several European countries caused greenhouse gas emissions to drop by 2–6 per cent, while the effect on GDP was neutral or even slightly positive.<sup>f</sup>

### EMISSIONS TRADING SCHEME

Several countries have planned to or have already implemented carbon markets. In Japan, the Tokyo Metropolitan Government introduced a mandatory CO<sub>2</sub> emission reduction and a cap-and-trade emission trading scheme after long negotiation with different stakeholders. It is the world's first such scheme that sets binding targets for buildings. (See Box 2.2 in Chapter 2.)

New Zealand is another industrialized country with a carbon market. The Government launched its emissions trading scheme in 2010. Cheap imported carbon credits comprise 99.5 per cent of the units New Zealand emitters use to meet their obligations, and the Government closed the loophole by excluding the emissions trading scheme from the international carbon markets as of 2015.<sup>g</sup> In neighbouring Australia, unfortunately, the Senate voted in July 2014 to scrap a planned emissions trading scheme that was to begin in 2015.<sup>h</sup>

Carbon markets are emerging more rapidly in a number of developing countries. The region's first nationwide emissions trading scheme started in Kazakhstan in 2013, and the first exchange deals opened in 2014. The overall objective is to reduce carbon emissions by 7 per cent below 1990 levels by 2020 and 15 per cent below 1992 levels by 2025.<sup>i</sup> Carbon markets are under consideration in Indonesia, Thailand and Viet Nam. Viet Nam may put forward an emissions trading scheme by 2018.<sup>j</sup> India has a Perform, Achieve and Trade scheme for trade in energy efficiency measures, which came into force in 2012.<sup>k</sup>

Between December 2013 and April 2014, six cities in China started emissions trading schemes (Beijing, Guangdong, Hubei, Shanghai, Shenzhen and Tianjin), making the country the second-largest carbon market in the world, after the European Union.<sup>l</sup> Preparations are underway for the introduction of a national emissions trading scheme in 2016.<sup>m</sup> The Republic of Korea's emissions trading scheme entered into force in January 2015 covering 23 subsectors.<sup>n</sup>

Source : Environmental tax reform and carbon pricing: Kiki Chan, Contributing paper to the Report on Transformations for Sustainable Development. Available from: [www.unescap.org/sites/default/files/RRSOED-Reforming-the-Investment-Landscape-for-Green-Transformation-by-Kiki-Chan.pdf](http://www.unescap.org/sites/default/files/RRSOED-Reforming-the-Investment-Landscape-for-Green-Transformation-by-Kiki-Chan.pdf); Emissions trading scheme: Jose Puppim de Oliveira, UNU (September 2015); <sup>a</sup> ESCAP, 2012; <sup>b</sup> KPMG, 2013; <sup>c</sup> GIZ, 2013; <sup>d</sup> The Climate Group, 2013; <sup>e</sup> Australian Government Department of the Environment, 2014; <sup>f</sup> The Climate Group, 2013; <sup>g</sup> Fallow, 2014; <sup>h</sup> Reuters, 2014 (17 July); <sup>i</sup> Carbon Market Data, Kazakhstan ETS Database. Available from <https://carbonmarketdata.com/en/products/world-ets-database/kazakhstan-ghg-co2-emissions-trading>; Point Carbon, 2014 (31 May); <sup>j</sup> Reuters, 2013 (12 November); Thailand Greenhouse Gas Management Organization, 2013; Point Carbon, 2012 (24 September); <sup>k</sup> Phillips, and Newell, 2013; <sup>l</sup> World Bank Group, 2014; <sup>m</sup> World Bank and Ecofys, 2015; <sup>n</sup> Ibid.

span, infrastructure “locks in” patterns of resource use and economic opportunity. Thus, countries’ patterns of development will be largely conditioned by the infrastructure choices they make now.

Responding to the region’s infrastructure needs through sustainable, efficient and equitable forms of infrastructure constitutes an opportunity to build the foundation for competitive, efficient and welfare-enhancing economies. Investment in mass transit has strong economic justifications (cost-efficient, reduces congestion), has positive equity implications (by enhancing access to mobility across a population, particularly low-income groups) and environmental benefits (low-carbon transportation service and shaping denser, more resource-efficient cities). The choice in energy infrastructure has strong implications for environmental protection and energy access but also the localization, number and quality of jobs generated.

### 5.3.4 STRENGTHENING TRANSFORMATIVE CAPACITY

Strengthening the transformative capacity of an economy improves its growth potential as well as the sustainability and inclusiveness of that growth. Economic growth is the result of processes of structural development and change. Two simultaneous processes drive economic transformation: (i) the generation of diversity and (ii) competitive selection to allocate resources.

Diversification expands the technological and organizational variety, from which innovations can be drawn. Economic growth is no more than an aggregated measure of the flows generated by such processes.<sup>30</sup> The capacity of an economy to diversify depends on certain competencies in the economy, such as entrepreneurship, technological and organizational practices and innovation, education, training and experience. Diversification should be steered towards products that require capabilities necessary to generate many other products, which will then provide platforms for further diversification.<sup>31</sup>

The core capabilities of an economy are underpinned by rules “expressed in a range of institutions, such as customs, norms, routines, laws, constitutions, fashions,

etc.”<sup>32</sup> Economic transformation involves changes in this set of rules (see Chapter 7 for discussion on how to change these rules). ♦

## 5.4 INITIATING CHANGE FROM THE BOTTOM: EMERGING NICHES

The development of niches (small, marginal areas of radical innovation) is another requisite condition for transformation. Energy systems, agriculture and infrastructure, for example, consist of niches that gradually became powerful enough to replace the dominant system.

### 5.4.1 RENEWABLE ENERGY

One of the most significant niches for the transformation of an economy is the production of energy from renewable natural resources. Renewable energy is becoming an increasingly important source of power globally.<sup>33</sup> In the region, the primary energy supply from renewable sources increased from 1990 to 2012, although as a percentage of total primary energy supply, the share of renewable energy decreased.<sup>34</sup> Nevertheless, there is currently strong policy action to increase renewable energy generation. In 2015, at least 20 countries in the region declared renewable energy targets, demonstrating commitment to renewable energy. SDG 7 (target 2) calls for a substantial increase in the share of renewable energy in the global energy mix by 2030, which should propel more efforts to increase renewable energy generation.

In countries that have experienced a tremendous increase in renewable energy production (such as China, India and Japan), government policy was essential in nurturing and empowering the renewable energy sector. They have created protective spaces for the sector (through policy and strategy) so that it can develop and expand into the country’s energy mainstream. Some countries (China and Japan) have become global leaders in low-carbon technologies. Although the primary motivation for many countries is energy security, investing in renewable energy also produces environmental co-benefits (Box 5.3), including the reduction of air pollution and climate change responses. In many other countries, increasing energy access in remote areas and easing the fiscal burden

are also part of the motivation for promoting renewable energy development.

The strategy of many Asian countries consists of attracting investment from the private sector (both international and domestic) and encouraging public-private partnerships. This strategy is supported by various policies, predominantly feed-in tariffs, which have proved a great success in Japan since 2012 when its feed-in tariff policy was initiated, and financial subsidies, such as an upfront subsidy for building integrated photovoltaic systems in China. Other strategies used to encourage small and medium-sized businesses into the renewable energy sector involve the adoption of carbon tax policies for traditional energy sources (as in Japan and the Republic of Korea) and government-funded loan schemes (as in Japan, where the Government initiated the loan scheme for households and small businesses that want to buy renewable energy facilities, especially solar panels, for domestic use).

A 2013 World Wildlife Fund report highlighted experiences in renewable energy policymaking in China, India and the Philippines, noting that institutional factors, including multiple stakeholder participation and acceptance, strongly influenced the extent to which those countries achieved their renewable energy targets.<sup>35</sup> Long-term human capacity development has also proven critical for achieving and sustaining national renewable energy capacity development.<sup>36</sup>

Unless renewable energy generation is accompanied by robust social and environmental safeguards, there are likely to be considerable environmental and social impacts, which has been the case with land-use conversion palm oil production in South-East Asia and hydropower development across Asia. Renewable energy projects must benefit host communities, such as financing for development projects and expansion of energy access.

**Box 5.3**  
Co-benefits  
of China's  
renewable  
energy  
transformation

China's energy system relies heavily on fossil fuels. The total amount of energy consumption in 2012 reached 3.6 billion tonnes of standard coal, in which the fossil fuels accounted for 90.6 per cent. Since 2010, China has overtaken the United States and become the world's largest energy consumer, contributing 21.9 per cent of the global energy consumption in 2012. With its rapid industrialization process and urbanization, China's tremendous energy demand will continue to grow. Although many measures have been proposed by its local governments to mitigate greenhouse gas emissions and improve air quality, limited economic resources have slowed their efforts.

Extensive environmental co-benefits are harnessed from using wind resources efficiently from some initiatives to promote renewable energy, such as in Xinjiang Uygur Autonomous Region. The co-benefits of wind power include the mitigation of CO<sub>2</sub> and air pollutants (SO<sub>2</sub>, NO<sub>x</sub> and PM2.5) emissions and water savings. Emissions mitigation by wind power accounted for 4.9 per cent of CO<sub>2</sub>, 4.3 per cent of SO<sub>2</sub>, 8.2 per cent of NO<sub>x</sub> and 4.2 per cent of PM2.5 emissions by the thermal power sector. The total economic co-benefits of wind power accounted for 0.5 per cent (nearly \$1.4 billion in 2009 dollars) of Xinjiang's GDP during the 2006–2010 period.

Wind power can help ensure regional energy security and also mitigate global greenhouse gas and local air pollutant emissions, leading to co-benefits in China and other parts of Asia. With rapid installation of wind power equipment, it is critical to uncover the embodied emissions of greenhouse gas and air pollutants from the wind power sector so that emission mitigation costs can be compared with a typical coal-fired power plant. A life cycle analysis for wind power sector using the Chinese inventory standards found that wind farms only release 1/40 of total CO<sub>2</sub> emissions that would be produced by the coal power system for the same amount of power generation, which is equal to 97.5 per cent of CO<sub>2</sub> emissions reduction. When compared with the coal power system, wind farms can significantly reduce air pollutants (SO<sub>2</sub>, NO<sub>x</sub> and PM10), leading to 80.4 per cent, 57.3 per cent and 30.9 per cent of SO<sub>2</sub>, NO<sub>x</sub> and PM10 emissions reduction, respectively. By considering both recycling and disposal, a wind power system can reduce 2.74×10<sup>4</sup> tonnes of CO<sub>2</sub> emissions, 5.65×10<sup>4</sup> kg of NO<sub>x</sub> emissions, 2.95×10<sup>5</sup> kg of SO<sub>2</sub> emissions and 7.97×10<sup>4</sup> kg of PM10 emissions throughout its life cycle.

In terms of mitigation costs, a wind farm could save \$37.14 per 1 tonne of CO<sub>2</sub> emissions. The mitigation cost rates of air pollutants were \$7.94 per kg of SO<sub>2</sub>, \$10.79 per kg of NO<sub>x</sub> and \$80.79 per kg of PM10 in 2012. Decentralized wind power developers should consider not only project locations close to the demand of electricity and wind resources but also the convenience of transportation for construction and recycling.

Source : Bing Xue and others, 2015, pp. 338–346; Zhixiao Ma and others, 2013, pp. 35–42.

## 5.4.2 ECOTOURISM

Given its extensive upstream and downstream links, multiplier effects and employment-generating and poverty-alleviation capacities, tourism can be a leading sector in the transformation towards sustainable development. The tourism sector is particularly labour intensive (providing opportunities for women and low-income groups in particular) and one of the fastest-growing sectors. Tourism is also a sector with the greatest current comparative advantage and development potential for the majority of least development countries and already one of the three leading foreign currency-earning sectors for at least 22 of them (such as Cambodia, Nepal, Samoa, Vanuatu and, to a lesser extent, Bangladesh, Bhutan, the Lao People's Democratic Republic and Myanmar).

Tourism expansion does not automatically lead to poverty alleviation or local employment generation. Ecotourism—the application of eco-labelling principles to tourism—is not only one of the fastest-growing segments, it can be a way to ensure that the necessary mechanisms for poverty alleviation and environmental protection are explicitly included in tourism planning.

Thus, as tourism in the region continues to grow, the development of ecotourism together with the generalization of ecotourism principles in the tourism industry will be necessary for structural transformation towards sustainable development. Because the term “ecotourism” is widely misused and abused as a mere marketing and promotional tool by many companies, regional cooperation to enforce standards will be necessary.

## 5.4.3 INNOVATIVE BUSINESS MODELS

Innovative business models are transforming the way companies create, deliver and capture value (Box 5.4). A common feature is the shift from labour-saving resource-intensive technologies to resource-saving technologies and dematerialization. In other words, switching from a focus on supplying products to a focus on supplying the services they provide. The function-oriented business model does not imply a transfer of the ownership of the product but guarantees the services provided. For example, companies

are selling “tyre services”, charged by the kilometre, to transport companies instead of tyres, or they are selling “carpeting services” instead of carpets. This shift creates incentive to reduce material input, increase the lifespan of products and facilitate repair, re-use, renovation, re-manufacturing and recycling. It is not only beneficial in terms of environmental sustainability but also allows combining economic growth and increased employment opportunities.<sup>37</sup>

Companies can choose to implement sustainable business models as part of various strategies (eco-efficiency, eco-branding and beyond-compliance environmental leadership). But the main incentive for a company to switch to innovative business models is the threat that current models are increasingly becoming non-viable. Some business models are particularly vulnerable to climate change or natural disasters while others are only viable because market failures are keeping environmental resources underpriced. The government mitigation of market failures will decrease profitability of unfair businesses and open them up to innovation. With environmental concerns mounting, the business models that are not able to adapt and transform will cease to be competitive. Policy levers to promote new business models include modifying incentives through pricing instruments, which again highlights the synergies between the top-down and bottom-up approaches. ♦

## 5.5 CONCLUSIONS

Structural changes are taking place in the region's economies. Despite improvements, progress has been limited in terms of environmental sustainability, especially regarding greenhouse gas emissions or biodiversity losses. Several planetary boundaries have been breached while basic human needs remain unmet. The pattern of economic structural changes taking place in the region most likely will not bring about sustainable development or, at least, not fast enough to respond to the challenges. Transformations will be needed in all dimensions of the structural changes to avoid the negative consequences of business as usual and align the megatrends with sustainable development outcomes. These transformations will require a combination of top-down action and bottom-up influence of strategic niches.

**Box 5.4**  
The sharing  
economy as a  
niche

The advent of the sharing economy holds strong potential for dematerializing economies. “Sharing economy” (also known as “collaborative consumption” or “peer-to-peer market”) is a term used to describe a business model that enables people to share and use goods and services and even skills without owning them. The activities and operations covered by the term are highly diverse, but the basic principle is the same: through the internet, owners of unused or underutilized assets or surplus goods are connected with others willing to pay to use them.<sup>a</sup> Four broad categories are considered as part of the sharing economy: recirculation of goods, increased utilization of durable assets, exchange of services and sharing of productive assets.<sup>b</sup>

At present, the most prominent sharing services are those based around accommodation and cars. But the sharing economy is also fast expanding to other possessions, such as bicycles, household appliances and even clothes. According to PricewaterhouseCoopers, these new business models have potential to grow from a \$15 billion industry today to a \$335 billion sector by 2025.<sup>c</sup>

According to a report by Nielsen (2014), Asian and Pacific countries are among the most receptive globally to the sharing economy, particularly those in South-East Asia; four of the top five markets prepared to share or rent their personal assets for financial gain are in South-East Asia.<sup>d</sup> Indonesians are the second most likely globally to rent products or services from a sharing community, while the Philippines ranks fourth.

Global companies that exemplify the sharing economy are rapidly expanding their operations in many Asian cities, but locally developed companies are also strongly taking root.<sup>e</sup> For example, Malaysia’s taxi smartphone application (app)<sup>f</sup> is considered one of the big start-up success stories of South-East Asia. Created in Malaysia in 2012, the app is now available in 21 cities across the region—in less than three years—and has raised \$340 million. The taxi app has several million downloads, registering an average of seven bookings per second.<sup>g</sup>

As sharing services become more numerous and more popular, they start to run into trouble with regulators, politicians and organized business interests (such as taxi associations) on issues around industry-specific regulations, insurance and legal liability. There are also concerns that they avoid taxes and regulation. There have been highly publicized cases in Guangzhou (China), New Delhi (India), Bandung (Indonesia), Manila (the Philippines) and the Republic of Korea.

Despite these setbacks, several countries have accommodated the sharing economy in their regulatory frameworks rather than banning it. Singapore<sup>h</sup> and the Philippines<sup>i</sup> allow ridesharing services to continue operating, but within the regulatory framework.

Is the sharing economy a force for transformation? It represents a shift in the mode of consumption, from ownership to access. By facilitating access to the use of underutilized assets and resources,<sup>j</sup> it helps ensure that existing materials are used more efficiently and, hence, the need to continually produce more is reduced.<sup>k</sup> It reduces additional resource consumption and waste generation and can even have a direct impact on air pollution and the burning of fossil fuels.<sup>l</sup> It has also been hailed for creating economic opportunities and, in the case of the taxi application, advancing mobility in urban areas.

More longitudinal empirical studies need to be undertaken to verify if these expectations from the sharing economy are borne out. What is clear from Asia’s experience thus far is that a proper regulatory environment could boost the potential of a niche to help advance sustainable development.

Source : <sup>a</sup> Analysts attribute the rise of the sharing economy to the confluence of several of this century’s big trends: widespread internet connectivity and the low-cost transactions it enables; increasing concern about house prices and traffic congestion; the demand for greater flexibility and customization in service delivery. See Leigh, 2015; <sup>b</sup> see Schor, 2014; <sup>c</sup> Shah, 2015; <sup>d</sup> Nielsen, 2014; <sup>e</sup> Forbes, 2014; <sup>f</sup> There is a difference between the business models used by Uber and GrabTaxi. Uber is a technology company that connects passengers and vehicles through its app. It doesn’t own the vehicles but only partners with private owners. Passengers pay for the rides using their credit cards registered on the app. The fares are split between Uber and the vehicle owners. GrabTaxi (and EasyTaxi) make use of existing taxi fleets. See [www.techinasia.com/uber-philippines-regulation/](http://www.techinasia.com/uber-philippines-regulation/); <sup>g</sup> See [www.techinasia.com/3-years-4-funding-rounds-grabtaxi-anthony-tan-reflects-journey/](http://www.techinasia.com/3-years-4-funding-rounds-grabtaxi-anthony-tan-reflects-journey/); <sup>h</sup> Balea, 2014; <sup>i</sup> Balea, 2015; <sup>j</sup> Baker, 2014; <sup>k</sup> Leigh, n.d.; <sup>l</sup> Shah, 2015.



### 5.5.1 CRITICAL ACTORS

Private sector actors, for their own viability, will need to transform their business model to incorporate disaster and climate risk-sensitive and resource-efficiency considerations. They also will need to seize the business opportunities arising from the changing context. Households' quality of life will depend on their capacity—often constrained notably by political factors—to accommodate changes in their lifestyle, concomitant to economic structure transformation staying or moving away from a consumerist culture to a sufficiency culture. And governments need to take a leading role in defining the objectives and rules and establishing a shared vision between the diverse interests related to the economic transformation. They should use the policy tools at their disposal to influence economic activities (through procurement, export policies or public investments) and create an enabling environment for activities that shape sustainable and inclusive growth.

### 5.5.2 GOVERNANCE CAPACITIES

Enhanced capacities would be needed to deliver the economic transformation at the local level, and especially at the city level. Governments must lead the development of a shared vision and demonstrate high-level policy commitment. They should establish long-term development strategies that balance economic, social and environmental protection goals.

Current national accounts will not be sufficient to monitor and thus manage the economic structure transformation. Developing a monitoring framework to track progress in the various dimensions of the transformations needed and their influence on the achievement of the social, environmental and economic objectives will be crucial. At the various levels of governance, it will be important

to ensure that priorities and targets are based on a broad consensus resulting from a participatory decision-making process.

### 5.5.3 REGIONAL COOPERATION AND INTEGRATION

Actions towards shielding, nurturing and empowering niches for economic structure transformation are directly related to the general trend of trade integration in the region. Hence, cooperation will be particularly important.

Developing countries will require access to international markets to diversify and expand their productive capacity and to technology transfer that can increase the diffusion of environmental goods and services. The APEC agreed to lower tariffs on a list of 54 environmental goods by 2015. The transformation for sustainable development also requires the possibility to temporarily shield nascent local industries against competition.

Regional cooperation, through the adoption of common standards, and the development of institutional frameworks grounded on fulfilling human rights, including the right to development, will be required for policy tools, such as eco-labels, that could be used as technical barriers to trade.

Finally, as the structure of economies change, the skills needed also change and hence the danger that workers who cannot quickly adapt will lose out. Failure to retool the workforce will not deliver an equitable economic structure transformation. National investment in education and (re)training to ensure that older workers can access new jobs could be further strengthened and supported by a concerted regional effort, considering that many countries are centres of innovation and home to world-class universities. 🌱

## ENDNOTES

- 1 Herrendorf, Rogerson and Valentinyi, 2013.
- 2 Labour productivity can increase because technical progress is leading to higher efficiency (through, for instance, technological progress, change in the efficiency with which known technology is applied, changes in the efficiency of the combination of inputs used or scale effect). But labour productivity can also increase because more of the other factors are used in the production process.
- 3 Without the first, there is little that propels the economy forward. Without the second, productivity gains are not diffused to the rest of the economy (McMillan and Rodrik, 2011).
- 4 United Nations, 2015d.
- 5 ADB, 2013.
- 6 Ibid.
- 7 Demographic transition is a model describing the transition from a state of high birth rate and high mortality to a state of low birth rate and low mortality. The transition period generally involves rapid population growth due to a lag between the reduction of mortality and the reduction of birth rate.
- 8 AfD WB, 2012.
- 9 The urban population increased from 289.9 million people in 1950 to 2.1 billion in 2015 and is projected to reach 3.2 billion people in 2050. See the ESCAP statistical database.
- 10 UN-Habitat and UNESCAP, 2015.
- 11 The share of agriculture in total value added has declined from 14 per cent in 1970 to 7 per cent in 2013; the share of industry declined from 40 per cent to 34 per cent, while the share of services increased from 46 per cent to 59 per cent. See the ESCAP statistical database.
- 12 More than 40 per cent of the agricultural area suffers from soil degradation, and freshwater supply per capita is about half the world's average, while climate change is amplifying the frequency and intensity of extreme events (ADB, 2013).
- 13 Industry's share of total value added has been declining in favour of services in developed economies since 1970 but also since 1990 in developing economies. Based on data from ESCAP statistical database. See also ESCAP, 2016 and ADB, 2014.
- 14 "While technological progress is no doubt a large part of the story behind employment deindustrialization in the advanced countries, in the developing countries trade and globalization likely played a comparatively bigger role" (Rodrik, 2015).
- 15 This shift of workers from one type of low-productivity activity to another explains why the working poor phenomenon, despite important progresses, is still prevalent in the region (30 per cent of total employment in 2013, 59 per cent in least developed countries) and why vulnerable employment accounts for around 54 per cent of total employment (80 per cent in least developed countries). See [http://unctad.org/en/PublicationsLibrary/ldc2013\\_en.pdf](http://unctad.org/en/PublicationsLibrary/ldc2013_en.pdf).
- 16 ADB, 2013.
- 17 See Freire, 2011.
- 18 ESCAP, 2013a.
- 19 This is especially important for countries with small domestic markets.
- 20 See Freire, 2011.
- 21 Economic growth implies increased output of goods and services. This can result from increases in the factor inputs or it can result from increases in the productivity (output per unit input) of those factors (Ayres, 1996).
- 22 The productivity of a factor of production can increase because of technical progress (technological progress, change in the efficiency with which known technology is applied, changes in the efficiency of the combination of inputs used or scale effect) or investment in education are leading to higher efficiency. But labour productivity can also increase because more of the other factors are used in the production process.
- 23 See the Statistical Annex, section B.
- 24 Labour productivity increase in the region has been in great part due to increased natural resources and machine inputs per worker.
- 25 Ayres, 1996.
- 26 These social changes include, for instance, the rise of the share of activities mediated through markets, a shift from forms of contracts enforced by social norms and communities to forms of contracts enforced by legal institutions, the replacement of "collective responsibility systems" by "individual responsibility systems", changes in living arrangements (villages versus cities or extended versus nuclear families) and greater participation of women to the workforce or demographic transition.
- 27 Pigovian taxation is designed to correct negative externalities imposing spillover costs on society.
- 28 A study in the Philippines on the total economic value of Mt. Bulanjó forest in the province of Palawan shows that timber represents just 1 per cent of the total forest value and is clearly outweighed by the value of the ecosystem services (clean air, soil erosion and flood prevention) that the forest provides.
- 29 Rodríguez and others, 2011.
- 30 See Foster, 2011.
- 31 ESCAP has developed a methodology to identify these key products.
- 32 See Foster, 2011.
- 33 According to UNEP (2015), "Wind, solar, biomass and waste-to-power, geothermal, small hydro and marine power contributed an estimated 9.1% of world electricity generation in 2014, compared to 8.5% in 2013."
- 34 See ESCAP, 2015e for a review of energy trends in Asia and the Pacific.
- 35 WWF, 2013.
- 36 Ibid.
- 37 Ayres, 1996.









# 6

## INVESTMENT FLOWS TRANSFORMATION

### KEY MESSAGES

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Too little capital is supporting the transition to a green economy, and too much continues to be invested in high-carbon and resource-intensive, polluting economies. Marshalling the Asia-Pacific region's capital is essential for achieving the Sustainable Development Goals.

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The benefits from environmentally and socially beneficial investments are inadequately valued. This results in misallocation of capital, contributes to market distortions and increases the potential risk to the economy and ecosystem service flows. Transforming financial flows will address systemic issues, such as environmental externalities that remain unpriced and regulations governing financial markets that disadvantage long-term, sustainable behaviour.

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## 6.1 INTRODUCTION

Investment is fundamental to realize the aspirational and transformative nature of the SDGs.<sup>1</sup> In 2015, governments in Asia and the Pacific adopted a regional action plan on financing for development to mobilize new and additional financial resources through a broad regional consultation processes facilitated by ESCAP.<sup>2</sup>

A substantial share of the region's financial capital is directed towards economic activities and sectors that do not contribute sufficiently to sustainable development and thus requires transformation. Investment flows towards sectors and economic activities aligned with sustainable development and its attendant objectives of prosperity for all must be expanded and displace investments that increase inequalities, accelerate resource depletion and environmental degradation and reduce social capital.

This transformation must take place in a context of efforts towards economic integration that will increase intraregional flows of capital, goods and services, expand investment opportunities and change economic structures. A challenge is to ensure that these new resource flows—including but not limited to financial services, trade finance, venture capital and insurance and stock markets—engage more in a low-carbon, resource-efficient and socially inclusive green economy.

It must also take place in a context of rapid urbanization, in which infrastructure needs are expanding, populations are growing and the demand for employment remains a priority policy concern. Investments in infrastructure must lead to greater inclusion and accessibility and more efficient resource use and strengthened social capital.

This chapter<sup>3</sup> focuses on those structural changes in the financial system that will provide an enabling environment for scaling up investments in natural capital and in integrating environmental objectives with social and economic development objectives.

While the broader context is acknowledged, the chapter focuses on environmental sustainability. Readers interested in broader issues related to financing for sustainable development can refer to the 2015 ESCAP publication *Financing for Transformation: From Agenda to Action on Sustainable Development in Asia and the*

*Pacific*, which highlights financing needs and discusses the approaches and opportunities available to meet those needs.

### 6.1.1 THE REGION'S FINANCIAL WEALTH

The Addis Ababa Financing for Development<sup>4</sup> outcome document calls for national integrated financing frameworks for sustainable development. These frameworks should be comprehensive, covering public financing, establishing appropriate policies and regulatory frameworks, unlocking the transformative potential of people and the private sector and incentivizing changes in consumption, production and investment patterns in support of sustainable development, including through

- public expenditure and tax reforms that link financing to policymaking;
- private sector investment, with guidance and regulation to promote private investment flows and to help small and medium-sized enterprises access investment; and
- increased and better coordinated and focused official development assistance (ODA).

While the region's financing needs with such integrated frameworks are large, so are current and future financial resources from a diversity of sources, including domestic private savings and investment, tax revenues, foreign direct investment (FDI), portfolio investment, ODA and South-South cooperation (Box 6.1). While ODA will continue to have an important role, it is clear that domestic savings and investments can be more effectively mobilized.<sup>5</sup>

There are barriers that need to be dismantled, however, to make financing flow towards efficient, clean and socially inclusive economic activity and away from those activities that perpetuate unsustainable practices.

### 6.1.2 CONSTRAINTS AND CHALLENGES

Many of the constraints to sustainable investment are outside of the financial system. Regulatory and institutional barriers often stand in the way of environmentally and socially beneficial long-term investment.

Box 6.1  
Tapping the  
region's financial  
wealth

**Domestic private:** Savings and investment—The region's gross national savings amounted to \$8.4 trillion in 2012, representing more than half of the world's total savings. It also held \$7.3 trillion in foreign exchange reserves in 2012.<sup>a</sup> High net worth individuals had \$12.7 trillion in assets in 2012, while the region's affluent population had \$20.5 trillion in assets. These values are forecasted to increase, respectively, to \$22.6 trillion and \$43.3 trillion by 2020.<sup>b</sup> The region's private wealth is forecasted to reach \$76.9 trillion by 2018.<sup>c</sup>

**Domestic public:** Tax revenues—There is significant potential for increasing tax revenues. Central government tax revenues in the region's developing countries accounted for only 14.8 per cent of GDP in 2011, compared with 17.1 per cent in Latin America and the Caribbean and 16.3 per cent in sub-Saharan Africa. Taxes are only collected from a narrow base of formal sector employees, with many individuals and businesses not paying any tax, whether because they are part of the informal sector or are covered by tax holidays and exemptions. In Bangladesh, for example, only about 1 per cent of the population pays income tax, while in India it is 3 per cent.<sup>d</sup> Tapping the tax potential in the region could raise \$440 billion in tax revenues in 17 countries, of which \$306 billion would be raised in developing countries.<sup>e</sup> Tackling illicit financial flows and corruption could free up substantial resources for sustainable development.

**International private:** Foreign direct investment and portfolio investment—The region increased its share of global FDI inflows from 16.2 per cent in 1990 to 37.5 per cent in 2012 (to around \$506 billion). These flows were highly skewed towards large emerging countries and resource sectors, however, and generally did not reach least developed countries and fragile States. There have been growing international equity and bond capital inflows, with around a third of the value of local government bonds as foreign holdings.<sup>f</sup> Potential disruptions caused by the increasing participation of international institutional investors in developing capital markets is a matter of concern, because it heightens their exposure to global financial conditions, contagion and herding.<sup>g</sup> For example, in China in 2014–2015, capital outflows—the net amount of assets leaving China—totalled \$450 billion,<sup>h</sup> which in turn led to a reduction of \$400 billion foreign reserves to prevent a precipitous drop in the exchange rate.<sup>i</sup>

**International public:** Official development assistance and South-South cooperation—Although ODA, or aid flows, to the region has declined, from around \$32 billion in 2011 to \$30 billion in 2012, it remains a significant source of development finance for least developed countries and small island developing States.<sup>j</sup> More aid now takes the form of South-South cooperation between countries, which within the region primarily means the better-off developing countries helping their neighbours. China, for example, is Cambodia's biggest aid donor, as is India for Nepal and Bhutan. Similarly, Thailand is the largest donor to the Lao People's Democratic Republic and the second largest to Myanmar.<sup>k</sup>

Source: <sup>a</sup> ESCAP, based on data from EM-DAT, [www.emdat.be](http://www.emdat.be); <sup>b</sup> PwC, 2014; <sup>c</sup> Ernst & Young, 2014; <sup>d</sup> ESCAP, 2014c; <sup>e</sup> ESCAP, 2014c; <sup>f</sup> ESCAP, 2014f; <sup>g</sup> IMF, 2014; <sup>h</sup> Kawa, 2015; <sup>i</sup> Davies, 2015; <sup>j</sup> ESCAP, 2014e; <sup>k</sup> ESCAP, 2010.

Perverse market signals, such as fossil fuel subsidies, and weak environmental regulation and lending regulations that do not recognize opportunities in the environment sector because of the difficulty of valuing the returns on these investments in “real money” terms hinder investment in a green economy.

Substantial public finance is spent on fossil fuel subsidies. Twenty per cent of the global energy subsidies are allocated in emerging economies in Asia, with 90 per cent of these subsidies covering petroleum products and electricity.<sup>6</sup> Government expenditure on fossil-fuel subsidies represents a huge lost opportunity for development, in terms of social spending on education, health care and other social sectors.<sup>7</sup>

Table 6.1 shows the size of fossil fuel consumption subsidies in selected countries as a percentage of GDP. Fossil fuel subsidies exceeded 3 per cent of GDP in four countries in 2011: Bangladesh, Brunei Darussalam, Indonesia and Pakistan, based on International Energy Agency and International Monetary Fund (IMF) estimates.<sup>8</sup>

Subsidies in the emerging economies totalled \$104 billion, based on IMF pre-tax figures in 2011, which was close to the total aid from the Organisation for Economic Co-operation and Development to the developing world.<sup>9</sup> In 2011, fossil fuel consumption subsidies in terms of US dollars were significant in China, India, Indonesia, the Islamic Republic of Iran and the Russian Federation, ranging from \$20 billion to \$82 billion.<sup>10</sup>

Figure 6.1 reflects a comparison of fossil fuel subsidies and public expenditure on education and health services in selected countries. The trends indicate that spending on fossil fuel subsidies tend to be higher than that for education and health services, such as in Bangladesh, India, Indonesia and Pakistan. Yet, education and health services are critical social factors when assessing the progress of inclusive growth.<sup>11</sup>

In the short-term, business competitiveness can be negatively impacted when fossil fuel subsidies are eliminated. In the long-term, however, higher oil prices improve business competitiveness by encouraging technological innovation and more efficient use of resources.

Fiscal crises tend to be the dominant motivation for many governments to reform fossil fuel subsidies—the budgetary impact of subsidies, often interacting within other pressures on government budgets and the domestic economy, foster political commitment to change.<sup>12</sup> Creating greater fiscal space through a reduction of the national budget deficit creates a strong argument for phasing out fossil fuel subsidies.

Investments for environmental sustainability are influenced by broader challenges related to developing the region's financial systems in ways that align the flow of credit and capital with sustainable development.<sup>13</sup> Relevant issues include:

- **Maturity and currency mismatches.** Banking dominates as a source of capital in many countries, including in China, where bank lending makes up 62.5 per cent of available credit. Where banking is especially dominant and other sources of funding are unavailable, funding for long-term infrastructure projects remains based on short-term deposits. International trade and finance are invoiced and settled in dollars predominantly, resulting in currency mismatches. Risk management is predominantly carried out through the holding of large amounts of foreign reserves.
- **Underdeveloped domestic asset management industry.** The region has high savings levels among households (and high net worth individuals) and nationally with sovereign wealth funds. However, the asset management industry is generally underdeveloped (outside of financial hubs, such as Singapore and Hong Kong, China), resulting in lower

Table 6.1 Fossil fuel subsidies in selected countries, 2011 (% of GDP)

Country	IEA estimates (%)	IMF estimates	
		Pre-tax (%)	Post-tax (%)
Pakistan	5.2	4	6.1
Bangladesh	5	5.1	7
Thailand	3	2.2	3.2
Viet Nam	3.1	0	0
Brunei Darussalam	3	3.3	8.4
Indonesia	2.5	3.2	5.4
Malaysia	2.5	1.9	7.2
India	2.1	1.7	4.5
Sri Lanka	1.9	1.6	2.8
Philippines	0.7	0	0.7
China	0.4	0.2	3.8
Lao People's Democratic Republic	-	0	0
Myanmar	-	0.5	1
Republic of Korea	0	0	1.5
Cambodia	-	0	0
Timor-Leste	-	0	0

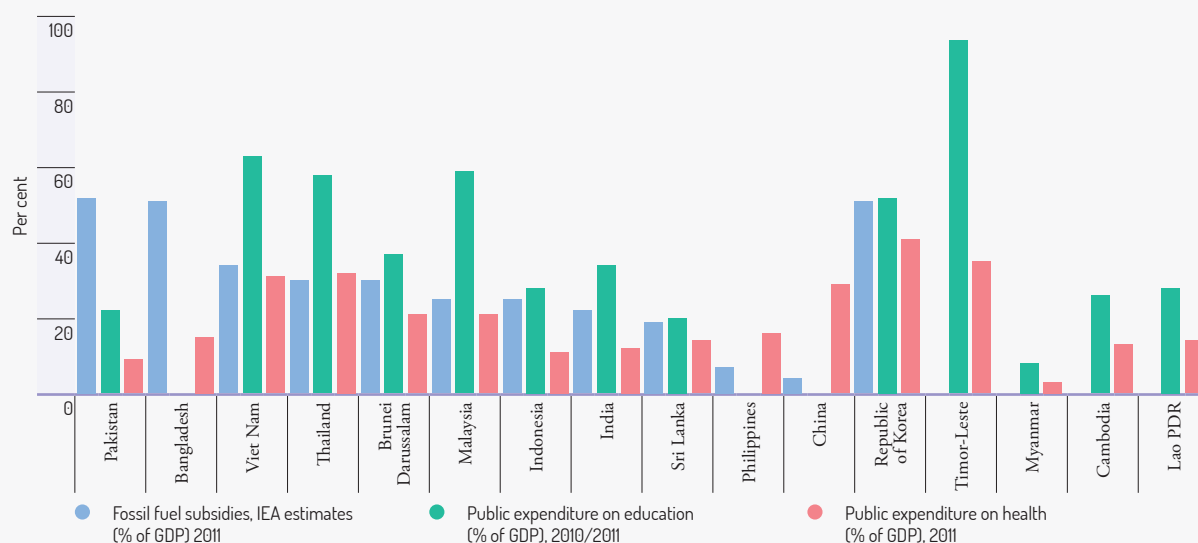
Note: IEA=International Energy Agency; IMF=International Monetary Fund.

Source: International Institute for Sustainable Development, Financing the Sustainable Development Goals Through Fossil-fuel Subsidy Reform—Opportunities in Southeast Asia, India and China (2015). Available from [www.iisd.org/gsi/sites/default/files/financing-sdgs-fossil-fuel-subsidy-reform-southeast-asian-india-china\(6\).pdf](http://www.iisd.org/gsi/sites/default/files/financing-sdgs-fossil-fuel-subsidy-reform-southeast-asian-india-china(6).pdf).

levels of involvement in managing long-term savings and investment towards infrastructure. With a lack of high-quality safe assets or appropriate long-term investment products, savings are often invested in foreign assets.

- **Low levels of financial inclusion.** Despite progress, billions of adults in the region lack access to reliable and comprehensible financial services, compounded by their low financial literacy and understanding. For example, while more than 80 per cent of adults in Mongolia and Thailand have an account with a formal regulated financial institution, in Bangladesh and India it is true for less than 50 per cent of adults, and in Cambodia and Pakistan it is less than 15 per cent.<sup>14</sup>

Figure 6.1 Fossil fuel subsidies and public expenditure on education and health services, 2011



Source: (1) Fossil fuel subsidies from Global Subsidies Initiative. Available from [www.iisd.org/gsi/fossil-fuel-subsidies](http://www.iisd.org/gsi/fossil-fuel-subsidies). (2) Public expenditure in education and health data from World Development Indicators. Available from <http://data.worldbank.org/data-catalog/world-development-indicators>. (3) Overall budgetary deficit data from Asian Development Bank database. Available from [www.adb.org/data/statistics](http://www.adb.org/data/statistics).

In many of the region's developing countries, access to financial services differs significantly for women and men. For example, while the percentage of men with an account at a formal financial institution in 2014 was 35 per cent, 63 per cent and 21 per cent in Bangladesh, India and Pakistan, respectively, for women it was only 26 per cent, 43 per cent and 5 per cent. This gap implies a need for financial inclusion for different groups in a society.<sup>15</sup>

- **Lack of understanding of credit risks and sound credit assessment processes for small and medium-sized enterprises.** Inadequate credit assessment systems lead to an acute lack of credit for small and medium-sized enterprises because banks are reluctant to lend to them due to their generally high risk and lack of borrowing history and collateral. In China, a system chain of mutual guarantees are used to secure bank loans, but this can lead to several businesses being vulnerable if one defaults on its loans.
- **Regional fragmentation.** While the regional share of trade is almost 50 per cent, the regional portfolio investment is only around 10 per cent, meaning that the region's financial institutions are more integrated with global markets than they are to each other. They are thus missing out on opportunities for using capital and savings within the region and for pooling

the risks to lessen their exposure to international volatility. Lack of harmonization of standards on taxation, transactions and investment reduces investor confidence and the flow of capital within the region.

- **Basic financial infrastructure.** Legal and institutional frameworks and governance systems remain inadequate in most low-income developing economies. Government-backed export credit insurance and guarantee institutions and export-import banks and credit rating institutions are still inefficient or missing in many developing countries of the region.

The region's financial systems can provide increasing resource flows for sustainable development once correct and balanced incentives are in place. For example, China's bond market will be an estimated ten times bigger by 2030, from just over \$3 trillion today to \$32 trillion—and the entire Asian financial system will more than double the size of the systems in the United States and Europe combined in 16 years' time, to about \$210 trillion, compared with \$91 trillion for the United States and \$82 trillion for Europe.<sup>16</sup> As with the growth of Asia's industries and megacities, the pivotal question is how to align growth in the region's financial markets with the sustainable development priorities.

Recent analysis suggests that bigger is not necessarily better in the case of financial system development; if the size of the financial sector goes beyond an optimal level, its size can become a constraining factor on overall productivity of the economy; estimates suggest that output volatility starts increasing when credit to the private sector reaches 100 per cent of GDP.<sup>17</sup>

The challenge is to develop the region's financial systems in ways that align the use of credit and capital with sustainable development.<sup>18</sup> There is growing experimentation on how best to achieve this through policy, regulations and market innovations, together with standards and fiscal measures, both internationally and within the region. Focusing on investments in environmental sustainability, the following sections highlight innovations that governments and regulators can use to promote structural changes towards investment flow transition and initiate the required shifts in the financial industry. ✿

## 6.2 LEADING FROM THE TOP: STRUCTURAL CHANGES TOWARDS INVESTMENT FLOW TRANSFORMATION

Policy-directed lending and investing strengthens the capacity of an economy to respond to the challenges of sustainable development in two important ways. The first is that policy-directed lending can assist the growth of specific sectors and provide a stable signal to investors. The second is that policy-directed lending lengthens the time-horizon of decision-making. Investments that target environmental and social returns along with financial returns become more viable.

There is a long history of policy-directed lending and investing in the region. Governments have established priority sector lending as a policy tool to improve access to credit for underserved sectors, particularly for small and medium-sized enterprises and agriculture. India, Indonesia, Malaysia, the Philippines, Thailand and Viet Nam, for instance, established priority sector lending in the private sector through quotas and interest rate caps.

### 6.2.1 BANK-BASED GREEN LENDING

Low and stable interest rates and inflation incentivize longer-term investment in productive infrastructure and enterprises. Non-traditional approaches to monetary policy, however, can more directly influence green and inclusive lending and investing. The Bangladesh Bank (the country's central bank), for example, has pursued a strategy of non-traditional central bank activities, such as low-cost refinancing of green and rural lending, which can improve the effectiveness in realizing traditional monetary policy goals as well as boost a green economy.

The China Banking Regulatory Commission has issued Green Credit Guidelines. The People's Bank of China, China's central bank, has launched a large research programme to analyse whether and how environmental risk should be included in its macroprudential analysis. The Indonesian Financial Services Authority published a Roadmap for Sustainable Finance in Indonesia in 2014.<sup>19</sup> More broadly is whether the growing balance sheets of many central banks, now globally at \$24 trillion, can be deployed in pursuit of green lending and investing, for example, by greening asset purchasing programmes.<sup>20</sup>

In April 2015, India's central bank asked lenders to treat loans to renewable energy projects as a priority sector lending area, aiding a \$200 billion federal spending plan to set up solar power plants and wind farms. In response, banks have committed to fund 3 trillion rupees, or \$47.2 billion, of renewable projects.<sup>21</sup> Development banks have also taken a role in long-term infrastructure investment. This form of policy-directed lending evolved to a new level recently with the establishment of the Asian Infrastructure Investment Bank.

### 6.2.2 GREEN BONDS

Greening the region's bond markets has become a practical possibility, led by a growing issuance of "green bonds". In 2013, the Korea Eximbank (Kexim) issued the first green bond in Asia to raise capital for environment-friendly projects. The Kexim green bond was oversubscribed by an estimated \$1.3 billion on the original \$500 million issuance and was a great success among global institutional investors, with 21 per cent going to Asian investors. The ADB is the third development bank to issue green bonds, totalling \$897 million. More recently, Taiwan Province of



China issued Asia's first corporate green bond (Advanced Semiconductor Engineering)—a \$300 million BBB-rated offering that was six times oversubscribed, while the Development Bank of Japan became the first Japanese issuer of a green bond with a €250 million green property bond, that was three times oversubscribed.

Green bonds are now emerging across markets in the region. China has indicated that green bonds will be an important part of the reform of its financial markets,<sup>22</sup> and it is possible that China will become the world's largest green bonds market in the next few years, driven by the Government's green agenda and by citizen concern to see environmental issues addressed. In December 2014, India set up the India Green Bonds Market Development Committee, hosted by the Federation of Indian Chambers of Commerce.

In Indonesia, the Government is developing an Islamic finance system, and green Sharia-compliant securities backed by a specific pool of assets (*sukuk*, or bonds)<sup>23</sup> to fund renewable energy generation. Other green infrastructure is likely to be an integral component. Malaysia, the world's largest Sharia-compliant debt market, is promoting green and socially responsible investment. In August 2014, the Securities Commission Malaysia introduced the Sustainable and Responsible Investment (SRI) Sukuk framework to facilitate the financing of sustainable and responsible initiatives, including projects relating to natural resources, renewable energy and energy efficiency. The state-owned sovereign wealth fund, Khazanah Nasional Berhad, launched the inaugural SRI Sukuk programme with 1 billion ringgit (MYR). The first tranche of MYR100 million was issued in June 2015 to finance the Yayasan Amir Trust Schools Programme.<sup>24</sup>

Bond market growth will be a particular feature of the next stage of development of the region's financial systems. Through local municipality, corporate and sovereign issuance, the region has the potential to lead in green bond issuance and benefit from their associated use of proceeds for green infrastructure and enterprise development, notably for the development of urban transport and energy infrastructure. Moving beyond one-off, ad hoc issuance to attract dual-interest investors, however, requires the development of standards (on what is green) and the establishment of associated ratings to enable "green as a risk factor" to be internalized into the

pricing. In addition, there should be penalties for non-compliance using fiscal measures.

### 6.2.3 ENHANCING ENVIRONMENTAL OVERSIGHT

**Prudential oversight:** Prudent regulators can strengthen investor governance, capabilities and risk management for sustainability in multiple ways. Targeting these areas can help tackle the psychological and behavioural factors that create short-term investment cultures.<sup>25</sup>

The Australian Prudential Regulatory Authority requires superannuation funds to report annually on how trustee training needs are determined and met so that trustees individually and collectively satisfy the requirement to have an understanding of investments and other issues. Policies to address air pollution, for example, might lead to increased loan delinquency rates for banks that lend to pollution-intensive industries and similarly for measures that target climate change that might impact the credit worthiness of carbon-intensive businesses, such as across the coal value chain.<sup>26</sup>

In India, the UNEP Inquiry into the Design of a Sustainable Financial System, working with the Federation of Indian Chambers of Commerce and Industry, highlighted opportunities to develop better market-orientated green financing, such as through better information and risk management, and through such instruments as green bonds for long-term green investment.

Ensuring that financial institutions undertake environmental stress testing is part of the solution currently being used on a trial basis in China for banks and in the United Kingdom for insurance companies, as is raising this practice to prudential and macroprudential levels where appropriate.

**Cross-border investment:** The Asia-Pacific region accounts for one third of global cross-border investment (FDI) flows, and this share is growing rapidly. Enhanced sustainability oversight from originating and host country regulators, such as China's Green Credit Guidelines that cover flows in principle when emanating from domestically licensed banks, together with dedicated

**Box 6.2**  
Taking a systemic approach to environmentally sustainable finance

Several countries in the Asia-Pacific region are emerging as leaders in the development of comprehensive, systemic approaches that embed sustainable finance at the heart of financial market development. While the impetus for these new approaches varies across country contexts—from delivering economic growth and financial inclusion in countries such as Bangladesh to combating urban air pollution in China—they are related in linking multiple efforts across institutional development, policymaking and market practice.

- Indonesia's new financial service authority, Otoritas Jasa Keuangan (OJK), established a Roadmap for Sustainable Finance. OJK is tasked with preparing a master plan for Indonesia's financial service sector for the period 2015–2024, which includes a requirement for priority allocation to certain sectors as well as enhanced reporting requirements and environment-responsible capital weighting for banks. It also requires increased understanding, knowledge and competencies in the financial services industry and the provision of incentives and coordination with related agencies.
- The People's Bank of China, building on the early work of other agencies and financial institutions, established in mid-2015 the Green Finance Task Force, co-convened and supported through the UNEP Inquiry into the Design of a Sustainable Financial System. The Task Force includes public and private organizations with responsibilities and interests in the development of China's financial system. The initial work has resulted in a suite of 14 proposals for greening China's financial system, which are now being taken forward with pressure from a newly established Green Finance Committee, again under the People's Bank of China.

Source: UNEP, 2015.

investment authorities, would make a considerable difference.

## 6.2.4 RISK MANAGEMENT AND ENVIRONMENTAL COMPLIANCE

**Sustainable banking:** Given the dominance of banking across the region's financial systems and the need for stronger enforcement of environmental regulations in many countries, there would be considerable benefit from establishing “green credit” risk management and reporting requirements to counterbalance the mispricing of environmental risks and requiring banks to target broader environmental policy objectives. Consideration might also be given to strengthening the incentives for green credit by offering green fiscal incentives.

**Lender and investor liability:** Environmental compliance can be strengthened where regulatory enforcement is weak by establishing lender and investor environmental liability, building in legal “safe harbours”, in which financial institutions can demonstrate robust environmental due diligence and oversight. Early-stage liability might affect reputations rather than have legal impact, such as when Singapore publicly highlighted banks and investors in financing companies that are non-compliant with Singapore's Trans-Border Haze legislation in their Indonesian operations.

An alternative where judicial capacity remains limited is to establish a flat-fee fine, an approach being considered in China. Also in China, the Green Finance Task Force, co-sponsored by the Research Bureau of the People's Bank of China and the UNEP Inquiry into the Design of a Sustainable Financial System (Box 6.2), has recommended issuing regulations on compulsory environmental pollution liability insurance; promulgation of detailed taxation and administrative licensing policies as supplementary measures; creation of an enabling framework for professional risk assessment services; identification and clarification of the environmental responsibilities of banks; assistance to victims of pollution in pursuing legal action against financial institutions that bear liability through their funding of pollution-intensive projects; and amending the Commercial Banking Law to further emphasize civil liabilities.<sup>27</sup>

The notion that environmental degradation is a source of risk provides incentive to the private sector to increase their investments in actions that secure natural capital. As discussed further on, niche partnerships between ecosystem managers and the private sector can couple with appropriate regulatory support (for example, ecosystem management models, such as payments for ecosystem services).

## 6.2.5 TRANSPARENCY

There are increasing moves to enhance the disclosure of environmental and, in some instances, social and governance risks. Publicly traded equities are a growing source of enterprise finance across the region and, like bonds, provide an important means for channelling savings aggregated through domestic and international institutional investors. There is potential for requiring listed companies to provide investors with material information about their social and environmental performance, building on the international experience of the Sustainable Stock Exchange Initiative<sup>28</sup> and the robust approach being developed by the Singapore Stock Exchange involving mandatory reporting and associated penalties for non-compliance. Such reporting allows for the development of indices, benchmarks and associated tracker funds, such as those developed by the Indonesian Stock Exchange.

Selected financial regulators are complementing their traditional oversight with green risk assessments, inspired in many instances by the Green Credit Guidelines of the China Banking Regulatory Commission. Also in China, there are moves to connect the large data sets managed by the Ministry of Environmental Protection and the People's Bank of China and the three other financial regulators in order to provide regulators, investors and banks with access to systematic information on the environmental features of both project owners and financial institutions (Box 6.2).

Transparency in regulatory systems is essential to foster transformation by creating room in financial markets for sustainable investment, including impact investment. ✿

### Box 6.3 Making 2016 the year of green finance

Following multiple advances of the sustainable development agenda in 2015, including the adoption of the Sustainable Development Goals and a new global climate agreement, attention is now focusing on practical measures to muster the trillions necessary to deliver the transition to a low-carbon green economy. China is spearheading this momentum at the international level through its upcoming G20 presidency, where it will launch a Green Finance Study Group, co-chaired with the United Kingdom, with support from UNEP as the secretariat. The objective of the Study Group is to develop policy proposals on how to generate private capital for green investment—thereby facilitating the green transformation of the global economy—via reforming and developing the global financial system. Going forward, this Study Group will engage non-G20 countries, international organizations and the private sector in the Asia-Pacific region, supporting deeper alignment of its financial systems with the green finance objectives.

Source: UNEP, 2015.

## 6.3 INITIATING CHANGE FROM THE BOTTOM: EMERGING NICHES

### 6.3.1 RESPONSIBLE INVESTING

Responsible investment explicitly acknowledges the relevance to the investor of environmental, social and governance factors and of the long-term health and stability of the market as a whole.<sup>29</sup> Investors have varied motivations for pursuing responsible investments as part of an overarching investment strategy. Reasons include commitment to industry good practices, a desire to make better-informed investment decisions and ethical or reputation concerns.

Responsible investing recognizes that the generation of long-term sustainable returns is dependent on stable, well-functioning and well-governed social, environmental and economic systems. Time frames are important; the goal is the creation of sustainable, long-term investment returns.

Responsible investment also requires that investors pay attention to the wider contextual factors, including the stability and health of economic and environmental systems and the evolving values and expectations of the societies in which they operate.

These contextual factors will drive industrial and economic change, and the most successful companies are likely to be those that respond appropriately to them. Indeed, there is growing evidence highlighting how companies that bring sustainability into the heart of their business strategy surpass their counterparts over the long term in their stock market and accounting performances.<sup>30</sup>

Asia's sustainable investment assets have grown by 22 per cent per annum since the start of 2012.<sup>31</sup> The largest Asian markets for sustainable investments, by asset size, are Malaysia, Hong Kong (China) and the Republic of Korea, and the fastest growing are Indonesia and Singapore.

Public policy critically affects the ability of long-term investors to generate sustainable returns and create value. Public policy also affects the sustainability and stability of financial markets as well as the economic, social and environmental systems.<sup>32</sup>

These goals align with the needs and interests of policymakers interested in long-term economic growth, competitiveness, employment, innovation, skills development and education, environmental protection and social stability.

There is need to better understand the implications of sustainability for investors and support financial institutions in incorporating these issues into their investment decision-making and business practices.

### 6.3.2 PAYMENTS FOR ECOSYSTEM SERVICES

Payments for ecosystem services (PES) are an important tool for internalizing the value of economic services in economic decisions. They can also be used as a tool for securing a sustainable stream of domestic financing as well as for capturing international demand. Properly designed, a PES scheme allows the synergizing of objectives, such as poverty reduction and biodiversity protection.

The critical, defining factor of what constitutes a PES transaction, however, is not just that money changes hands and an environmental service is either delivered or maintained. Rather, the payment must cause the benefit to occur where it would not have otherwise. PES schemes enable companies to help conserve an ecosystem to ensure that the service they depend on for their business is not at risk of disappearing, to secure access to biological resources and to demonstrate environmental responsibility.

Regulations mandating payments for ecosystem services for companies that use them intensively (water providers and ecotourism companies, for example) and the willingness of local governments to bring together beneficiaries of ecosystem services and those that practise sustainable land management provide enabling environments for investing in payments for ecosystem services. For instance, the Government of China introduced a Sloping Land Conversion Programme and Forest Ecosystem Compensation Fund to support watershed management.

In Sibuyan Island, Philippines, a PES scheme focused on enhancing the water supply and reducing sedimentation. PES payments made up to 81 per cent of the total gross incomes of the indigenous people who promoted non-destructive land use in the watershed area.

Asian and Pacific governments and civil society organizations are interested in PES schemes as an innovative policy instrument and management model with multiple benefits. PES schemes align the interests of various stakeholders—those who are responsible for managing ecosystems in a sustainable way can receive monetary payments (or other types of benefits) in return for their actions to secure ecosystem services that benefit those who pay for the services. In many cases, these are indigenous or rural communities with limited sources of income. These payments can have important impact on small communities.

Those who typically have an interest in paying for these services, such as water bottling companies, hydropower companies or ecotourism operators, often have no other means of ensuring that the natural capital on which their business interests depend is well maintained. If scaled up through partnerships that bring the interests of these diverse groups of stakeholders together, PES schemes

could prove transformative by securing both natural and social capital simultaneously and changing the perceived value of ecosystems in the wider society. ✦

## 6.4 CONCLUSIONS

The Addis Ababa Action Agenda, the 2030 Agenda for Sustainable Development and the Paris Agreement under the United Nations Framework Convention on Climate Change adopted by United Nations Member States provide windows of opportunity to renew and advance commitments and action towards more sustainable financial systems. They emphasize the importance of nationally owned sustainable development strategies with integrated national financing frameworks.

Sustainable financial systems can enhance the efficiency, effectiveness and resilience of the region's financial and capital markets. Placing sustainable development at the heart of financial and capital markets does not represent an additional performance measure. On the contrary, it improves the availability of material information, enhances the all-important task of risk pricing and the efficacy of credit and capital allocation. Increasing the flow of finance into the enablers of a healthy and dynamic, inclusive, sustainable economy secures higher, long-term, risk-adjusted returns and improves the resilience of the financial system. Aligning the region's financial systems with sustainable development is thus the basis with which they can be made fit-for-purpose in the twenty-first century.

Critical to success is the involvement of stewards of the financial system, including central banks, regulators, prudential authorities, standard setters, government bodies (including ministries of finance) and market-based rule setters, including stock exchanges and credit rating agencies. There are also critical roles for other actors:

- **Market actors:** from banks to pension funds and analysts contributing through exemplary leadership, knowledge development and expert guidance, coalition building and advocacy.

- **Sustainable development community:** from environmental ministries to think tanks, civil society and agencies, such as UNEP, ESCAP, the United Nations Development Programme and international finance institutions, bringing expert knowledge, coalition and public awareness building.
- **Individuals:** as consumers of financial services, as employees of financial institutions and as participants in civil society, bringing unique skills and perspectives on how to connect the financial systems with human needs and aspirations.

Many of these actors need to engage in coalitions in their respective roles, nationally, regionally and internationally. However, there is a deficit in their knowledge and capabilities: first, regarding the financial system among citizens groups and the environmental and broader sustainable development community; and second, among financial system experts when it comes to environmental sustainability. Specific initiatives to bring these actors together are particularly important to create shared understandings of how to deliver strategies for change.

The measures suggested here are important for preparing each country's financial system in the context of regional economic and trade integration processes for maximizing the benefits of increased financial flows for sustainable development.

The potential for strengthening the response in the directions suggested here will be increased if regional economic and trade integration processes pay particular attention to ensuring that realistic but meaningful environmental and social regulations and standards are established as integral parts of economic and trade agreements and fully respected by both investing parties and the targeted recipients. Voluntary actions by markets, however, require regulatory support. ✦



## ENDNOTES

- 1 Based on ESCAP research, the Asia-Pacific region needs to invest more than an estimated \$2.5 trillion a year between 2013 and 2030 to achieve some of the Sustainable Development Goals. China alone estimates that it needs some \$460 billion a year for clean energy, energy efficiency and environmental protection, according to the most recent estimates made by China's Development Research Centre of the State Council working with the International Institute for Sustainable Development and the UNEP Inquiry into the Design of a Sustainable Financial System. The World Bank estimates that climate adaptation will cost \$25 billion annually between 2010 and 2030. Providing for basic socioeconomic needs and access to modern energy services requires some 3–6 per cent of GDP over the period 2013–2030 in China, India and Indonesia, but for Bangladesh and Fiji, the figures are 16 and 10 per cent of GDP, respectively. See Asia-Pacific Outreach Meeting on Sustainable Development Financing Jakarta, Indonesia, 10 June 2014, Overview Presentation by Dr Shamshad Akhtar, Under-Secretary-General of the United Nations and ESCAP Executive Secretary; International Institute for Sustainable Development and Development Research Center of the State Council of the People's Republic of China, 2015; World Bank, 2010; and <http://web.unep.org/inquiry>.
- 2 Three meetings: Asia-Pacific High-Level Consultation on Financing for Development (Jakarta, April 2015); Asia-Pacific Outreach Meeting on Sustainable Development Financing (Jakarta, June 2014) and Regional Meeting on Financing Graduation Gaps of Asia-Pacific Least Developed Countries (Dhaka, October 2014).
- 3 This chapter draws on the report *Aligning the Financial Systems in the Asia-Pacific Region to Sustainable Development*, prepared by the Inquiry into the Design of a Sustainable Financial System, which was initiated by UNEP to advance policy options to improve the financial system's effectiveness in mobilizing capital towards a green and inclusive economy. Established in January 2014, it released its final report in late 2015. See [www.unep.org/inquiry](http://www.unep.org/inquiry) for more information on the Inquiry. Additional material provided by UNEP Regional Office for Asia Pacific. The chapter is also informed by the outcomes of ESCAP-facilitated regional processes (2014–2015) to determine regional priorities on financing for development. (Refer to endnote 2.)
- 4 The Addis Ababa Action Agenda embodies a global commitment to the “financing and creating an enabling environment at all levels for sustainable development in the spirit of global partnership and solidarity”. This global agreement seeks to “overhaul global finance practices and generate investments for tackling a range of economic, social and environmental challenges”.
- 5 ESCAP, 2014f.
- 6 International Institute for Sustainable Development, 2015.
- 7 Ibid.
- 8 IISD, 2015.
- 9 Ibid.
- 10 A large level of subsidies of a country in US dollar terms may capture a different dimension in percentage of economic terms. For instance, China's size of fossil fuel subsidies is large in US dollar terms, but the pre-tax figures suggest that they are small in relation to its economy. On the contrary, in Sri Lanka, the size of subsidies is small but relatively large in terms of its economy.
- 11 ESCAP, 2015a.
- 12 IISD, 2015.
- 13 ESCAP, 2010.
- 14 World Bank, G20 Financial Inclusion Indicators dataset.
- 15 Ibid.
- 16 Davies, 2014.
- 17 Arcand, Berkes and Panizza, 2015.
- 18 ESCAP, 2010.
- 19 Volz, 2015.
- 20 UNEP Inquiry, 2015a.
- 21 Singh, 2015.
- 22 UNEP Inquiry, 2015a.
- 23 See the website of the Climate Bonds Initiative. Available from [www.climatebonds.net/projects/facilitation/green-sukuk](http://www.climatebonds.net/projects/facilitation/green-sukuk).
- 24 Chew, 2014; Kepli, 2015.
- 25 UNEP Inquiry, 2015b.
- 26 UNEP Inquiry, 2015a.
- 27 UNEP and People's Bank of China, 2015.
- 28 Of which the Stock Exchange of Thailand, Bursa Malaysia, Hanoi Stock Exchange, Ho Chi Minh Stock Exchange, Borsa Istanbul, Korea Exchange, Colombo Stock Exchange and Bombay Stock Exchange are members.
- 29 UN Principles for Responsible Investing, [www.unpri.org/introducing-responsible-investment/](http://www.unpri.org/introducing-responsible-investment/).
- 30 EC, UNEP and UN Global Compact Brief, <http://2xjmlj8428u1a2k5o34l1m71.wpengine.netdna-cdn.com/wp-content/uploads/1>.
- 31 Association for Sustainable and Responsible Investment, 2014.
- 32 Principles for Responsible Investment, UNEP Financial Inquiry, UNEP Finance Initiative, UN Global Compact Policy Frameworks for Long-Term Responsible Investment, 2014.

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# 7

## MAKING THE TRANSFORMATION: GOVERNANCE CAPACITIES AND REGIONAL ACTION

### KEY MESSAGES

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This report underscores that successful transformations require vertical (top to bottom) and horizontal (across actors) alliances among governments, technology innovators, market actors and citizens.

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Governments need to develop their capacity to set clear direction for transformation, implement structural changes and manage the transformation process. Effective government leadership is needed to manage the politically complex nature of transformation with the values extolled through the 1992 Rio Declaration on Environment and Development, Agenda 21 and international human rights treaties guiding each country's strategy.

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Transformational alliances need to be forged beyond national boundaries—energy systems, transport systems and resource-exploitation regimes are all influenced by national and international norms and agreements. Hence, many policy and market changes will be more effective if implemented across national boundaries.

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## 7.1 INTRODUCTION

**A**s a universal agenda, the SDGs require that all countries build up their capacities to carry out the fundamental reforms in their own societies as well as collectively at the global level.

This final chapter concludes with recommendations for governing and sustaining transformations in the environmental domain. Recognizing that there is not one regional solution, the intent is to highlight the common capacities that are needed. These entail the capacity to set clear direction for transformation; capacity to implement structural change; and capacity to manage the transformation processes. The chapter then describes the types of regional cooperation critical for achieving transformation for sustainable development. It emphasizes the importance of a strategy to initiate and sustain transformation—defining policy and making the regulatory and institutional changes that enable new and powerful alliances of actors whose purposes and interests recognize the imperative of a sustainable path into the future. ♦

## 7.2 STRENGTHENING GOVERNANCE CAPACITIES FOR TRANSFORMATION

**T**he capacities required to sustain the reforms highlighted throughout this report depend on governance and innovation capacities, wealth and poverty levels, and natural, human and financial resource endowments. Despite their differences in capacities and transformation contexts, the region's countries face common challenges. Forging political consensus on the direction each country should take for its sustainable transformation is a common challenge for all governments, regardless of development level. Building consensus on the values that drive transformation is probably the foremost challenge but the most important requisite.

### 7.2.1 CAPACITY TO SET A CLEAR DIRECTION FOR TRANSFORMATION

The 2030 Agenda for Sustainable Development embodies the global consensus on the need to pursue a transformative

development agenda. This Agenda now needs to be translated at the national level.<sup>1</sup> Hence, governments must build up their ability in making clear the direction their country must take to transform its business-as-usual approach to development. This process, however, cannot go forward without broad stakeholder participation.

The values extolled through the 1992 Rio Declaration on Environment and Development and Agenda 21 should guide each country's strategy: the centrality of human beings to sustainable development; the importance of the environment for current and future generations; and participation of all citizens. The values of the ten core international human rights treaties, beginning with the Universal Declaration of Human Rights, must be infused into the process as well. These values will define the direction of transformation and shape the goals.

Integrating these values into development models, through legislation, discourse and practice, is critical. The issues are complex and the power and capabilities of the different actors to shape agendas and ideas are highly unequal. The values also dictate the risks and trade-offs that societies are willing to make.

It is also necessary to find the balance between the short-term and long-term development goals of equity, justice and environmental sustainability. While governance needs to be oriented towards long-term thinking and action on sustainability, it must also provide solutions for the near future.<sup>2</sup> This is particularly important for developing countries that need to urgently deliver on immediate goals, such as jobs, food security and shelter.<sup>3</sup>

As agreed in the Rio+20 declaration, strengthening the science-policy interface<sup>4</sup> at various governance levels is important. This strengthening must target two components: the knowledge base and the management platform to revise and adapt the strategies. Governments need to create and maintain a knowledge base on the critical areas of resource use, social justice, economic structure, investment flows and environmental thresholds. Strategies for sustainable transformation will be appropriately developed only if the status quo of each area is understood—better data aid sound decision-making. As highlighted in Chapter 2, this is particularly critical for responding to the environmental limits when making policy because the scientific knowledge on regional and local thresholds is constantly changing.



Setting the direction for transformations also requires that governance be adaptive and emphasize monitoring, learning and reflection. In operational terms, this means that governments should have a management platform and systems to gather, synthesize and react to new information as it becomes available.

## 7.2.2 CAPACITY TO IMPLEMENT STRUCTURAL CHANGES

Transformation as explained throughout this report can be realized through fundamental structural changes, such as changes in the conditions that drive policy choices, investment decisions and resource use behaviour. The required changes vary from one type of transformation to another. Achieving transformation for social justice and recognizing environmental limits necessitate shifts in policymaking, mindsets and the norms that govern economic decision-making. Transformation for sustainable resource use, directing investment flows towards sustainable development and economic structure transformation require changes in regulations, subsidies, incentives and taxes to better reflect the price of resources, environmental externalities (pollution, emissions) and long-term resource scarcities.

There is strong evidence on the various policy instruments for achieving these structural changes.<sup>5</sup> What is lacking is discussion on how to create amenable conditions to carry out the policies. Making and implementing structural changes is not just a question of mobilizing financial resources and technology—it is about managing a politically complex process.

Structural changes of governance and economies to embrace sustainable development require addressing issues of power and special interests. As Scoones and others (2015) explain, “Questions surrounding what counts as green (transformation), what is to be transformed, who is to do the transforming, and whether transformation, as opposed to more incremental change, is required are all deeply political.”<sup>6</sup> With compelling scientific evidence that the environmental limits are increasingly being breached, the speed and scale of the transformation for sustainable development matters.<sup>7</sup> Effective government leadership is needed to manage the political nature of setting the direction for change.

Following through on structural changes also needs to nurture the “right” political conditions. It is vital to understand how power structures might enable or oppose the necessary transformation. Effecting change in the nature of incentives, for instance, is critical for reforms but may be resisted. The region has experienced unsuccessful well-meaning efforts to reform perverse incentives due to successful opposition campaigns of those who benefit from the status quo. Therefore, everyone managing the transformation process need to navigate the political economy of transformation as well as the political interests and values of all actors to inform their country’s priorities and how the transformations will be supported.

Implementing structural changes should seize the political windows of opportunity that may arise during times of crisis.<sup>8</sup> The literature on transformation shows the importance of seizing the opportunity created for the proliferation of innovative niches by destabilizing tensions in the dominant systems.<sup>9</sup> The triple food-fuel-financial crises in 2008–2010, for instance, enabled several efforts to reform environment-harming fossil fuel subsidies<sup>10</sup> and the introduction of fiscal stimulus measures that included considerable investments in green sectors (the so-called “green new deal”), such as renewable energy and energy efficiency. Governments must be quick in recognizing and seizing these windows of opportunity because they shrink rapidly as public attention declines or shifts to other issues.

The preceding chapters highlight how structural changes “from the top” succeed if pressure is also exerted “from the bottom.” In particular, the collective action of governments, market actors, NGOs, political networks and movements and consumers can be critical for an innovative niche to penetrate mainstream practices.

## 7.2.3 CAPACITY TO MANAGE THE TRANSFORMATION PROCESS

Top-down approaches can be state-driven reforms of structures and incentives. Bottom-up actions stem from the demands and new ideas from innovators, investors, entrepreneurs and civil society, among others. They originate from niches that challenge and eventually replace prevailing practices. Successful transformation thus requires alliances vertically (top to bottom) and horizontally (across actors).

Alliances across sectors need to break vested interests around unsustainable practices. In addition, because major reforms produce winners and losers, they run the risk of opposition and/or elite capture. The slow introduction of feed-in-tariffs (a policy instrument that has led to the widespread diffusion of renewable technology in many countries) in the Philippines<sup>11</sup> and Malaysia<sup>12</sup> illustrates the importance of alliances—or the lack of them.<sup>13</sup> Sustaining reform inertia or overcoming capture by vested interests requires societal movements through new coalitions, partnerships and networks that build up continuous pressure on politicians and markets.<sup>14</sup>

Most importantly, governments must have the will along with the ability to manage the distributional impacts of transformations, particularly the impacts on vulnerable social groups with limited capability and skills to cope with income loss and to benefit from opportunities that may emerge. As argued in Chapter 5, economic structure transformation may result in job creation and an increase in the productivity in many sectors, but it will not be automatically inclusive. There needs to be a strategy to prevent the exacerbating of income inequality, which may result if people lose their jobs in the process of a shift or do not benefit from the jobs created.

Transformational multisector alliances have to be forged within government structures. Government agencies must be more vertically and horizontally coordinated to manage the complex multidisciplinary issues. In particular, ministries of environment need to strengthen their ability to manage cross-sector issues. Marshalling clean energy finance, for example, requires dialogue with a range of sectors, including energy, transport and finance.

Subnational governments also need to learn how to better manage transformations. Studies of past and ongoing transformations at the subnational level within the region indicate that local governments had more prominent involvement than local governments in Western countries.<sup>15</sup> For example, the region's urban transition is taking place outside the capital centres, in small and medium-sized cities. But most of them are struggling within their human, financial and organizational limitations.<sup>16</sup>

While it is important that national and subnational governments steer the priorities for transformation, creating spaces for meaningful citizen engagement is equally important. As Chapter 4 stresses, civil society groups are a

necessary element in sustainable transformations to ensure just and fair strategies. But civil society groups have diverse interests and have different capacities to engage in the process. This differential capacity has to be considered when engaging civil society.<sup>17</sup>

In many cases, transformational alliances need to be forged beyond national boundaries—energy systems, transport systems and resource-exploitation regimes are all influenced by national and international norms and agreements. For example, the translation of carbon markets from economic theory to reality was, to a great extent, instigated by the Kyoto Protocol to the United Nations Framework Convention on Climate Change.<sup>18</sup> ❖

## 7.3 REGIONAL COOPERATION FOR TRANSFORMATION

The policy and market changes discussed in Chapters 3–6 all fall within the context of national boundaries. Vandemoortele (2011) found when reflecting on the implementation of the MDGs, “To be successful, transformations must be driven by an internal impulse for change.”<sup>19</sup> However, regional cooperation cannot be underestimated. The potential of regional cooperation can help achieve two strategies discussed in this report: alliance building and changes in policy, regulations and markets by encouraging the shifts simultaneously in several countries.

Changes that are perceived to affect a country's economic competitiveness in trade and as an investment destination, such as carbon tax, will have a greater chance of succeeding if harmonized at the regional level—if countries engage in the same shift at the same time. When the geographic scope is wider, changes are more effective and cost-efficient. With globalized production systems and the global movement of capital, environmental pressures easily originate from outside national borders, such as through trade and investment. In many situations, policy and market changes will not work unless implemented across national boundaries.

ESCAP member States recognize the importance of regional cooperation in advancing the 2030 Agenda. At the second session of the Asia-Pacific Forum on Sustainable Development (APFSD) in 2015, the region's leaders agreed to initiate a regional road map for pursuing the 2030 Agenda. This is an important step towards coordinating

and pulling together the region's resources and capabilities to support transformations for sustainable development.

### 7.3.1 ALIGNING THE MEGATRENDS WITH SUSTAINABLE DEVELOPMENT

The region's megatrends will have strong influence on the environment's health in the coming decades. Another aspect of managing sustainable development requires pulling megatrends into alignment with the needed transformative shifts.

This begins with making existing regional integration efforts in trade, investment and infrastructure consistent with sustainable development. These integration efforts hold enormous potential once they are framed by the three dimensions (economic, social and environmental) of sustainable development.

For example, rules and instruments that are affected by regional trade and investment agreements (intellectual property rights, investment policies, resource pricing and supply chain regulations) need to be harmonized to facilitate a race to the top, or the upward convergence of environmental standards that impact positively on social standards. Trade integration should establish mechanisms to promote resource productivity and sustainability across the entire production and supply chains (specific steps in making trade and investment work for sustainable development are discussed in a 2015 report from the Institute for Global Environmental Strategies<sup>20</sup>).

### 7.3.2 NURTURING STRATEGIC NICHES

Countries should make use of the regional trade and investment frameworks and responses to the common challenges (urbanization, energy security and resource scarcity, for instance) to facilitate joint investments in strategic niches that have high transformative potential. For instance, emission trading schemes will deliver more environmental and economic benefits once they have larger geographic coverage. The region should begin examining the technical and economic feasibility of such systems, drawing from the experiences of the European Emissions Trading Scheme and the recently introduced schemes in China, Japan and the Republic of Korea.

Transformation needs to be underpinned by a “skills revolution” to nurture labour forces that can make sustainable development happen,<sup>21</sup> because the assimilation of new knowledge and technologies requires adaptation to local conditions and circumstances.<sup>22</sup> Learning and innovation capacity needs to be built up in all countries and should be one area of regional cooperation. There is a wealth of resources within the region to accomplish this—many countries are recognized world leaders in technological innovation, including in renewable energy and environmental goods and services. They can provide technical assistance to their neighbours. Mechanisms could be created to support a culture of innovation in developing countries, building from the innovation excellence achieved in OECD countries of the region.<sup>23</sup> Some countries, such as India, have a strong culture for grass-roots innovation, which could provide important laboratories for adapting technologies for local use in developing countries.<sup>24</sup>

Alliances beyond national borders, such as technical cooperation with experts and inter-firm partnerships and social networks, could enhance niche development by spurring a flow of knowledge, technological know-how and financial resources.<sup>25</sup> The success of China in establishing a world-class domestic wind power industry demonstrates this point: Alliances outside the country helped build the success; and based on that success, China is in a good position to engage in clean energy cooperation in the region.<sup>26</sup>

### 7.3.3 TRACKING AND RESPONDING TO EMERGING ISSUES

Threats and opportunities for transformation arise when there are changes in the development context. Regional cooperation in monitoring emerging issues is important for transformation for sustainable development.

There are several emerging issues that require regional investments in monitoring and research: (i) the regional and local thresholds of planetary limits (understanding and tracking them); (ii) the impacts of green growth policies (which have had an upsurge in the region in the past seven years); (iii) the impacts of transformative policies on different social groups; and (iv) increasing resource productivity.

Understanding the emerging technological and social innovation requirements for delivering the 2030 Agenda is needed, as well as the financing and business models that will make these technologies accessible by marginalized groups.

The preceding chapters emphasize that best practices for increasing energy efficiency, renewable energy, green building and technological innovations are fast emerging and can facilitate peer learning across the region.

The spectacular economic transformation of Singapore and the Republic of Korea, which delivered dramatic increases in GDP per capita and improvements in human development within a relatively short time frame, are powerful reminders that such capacities can be instilled. The economic transformations of China and Viet Nam also are examples that competency for managing transformations that involve massive sectoral shifts and expanded production capabilities can be developed rapidly.<sup>27</sup>

Peer learning at the regional level should be strengthened, such as through the Asia-Pacific Forum on Sustainable Development, to spread successes and lessons learned across the whole region, particularly in the context of how best to achieve the SDGs and for following up and reviewing progress. ❀

## 7.4 FORGING A TRANSFORMATIVE ALLIANCE TO DELIVER THE 2030 AGENDA

Who or what should lead transformations for sustainable development—the government, technology, markets or citizens? This report underscores that all are needed. The successful sustainability initiatives taking place already all demonstrate the crucial role of an active government for catalysing transformations in various economic, social and political contexts by envisioning, empowering and nurturing alternatives to business-as-usual development. But a government acting alone will not succeed—transformations need a dynamic

private sector, engaged citizens and active civil societies. The headway made by Singapore in energy-efficient buildings (Chapter 3), for instance, was propelled by the social consensus that green buildings are necessary. And stakeholder engagement is one of the reasons for the successful introduction of a mandatory CO<sub>2</sub> emission reduction and a cap-and-trade emissions trading scheme in Tokyo (Chapter 2).

Markets can allocate scarce resources efficiently, if they are regulated and accountable for the fulfilment of universally agreed human rights and social justice standards. Yet, markets on their own are unlikely to drive the transformative changes needed. Supplementing the “invisible hand” of markets with a “visible hand” aimed at fostering long-term common interests, public institutions need to provide the legitimate rules and organizational capacity required to promote transformations at all levels that would enable countries to fulfil their development aspirations within the environmental limits.

As evident from the MDGs experience, without the proper incentive framework and rights-based regulation enabled by public action, it is not possible for investments to flow automatically to public goods, such as public transport, water and sanitation facilities.

Spaces for citizen engagement will be critical in organizing transformations for sustainable development based on the principle that every citizen has a role in sustainable development and the right to benefit from it.

The formulation of the 2030 Agenda was by far one of the broadest United Nations consultation processes ever undertaken, involving an intense three-year global conversation that connected remote villagers across the world to the United Nations General Assembly in New York. With increased participation also comes an increased stake in the process and expectations. Hence, the challenge of delivering on these expectations within this generation has never been greater. As United Nations Secretary-General Ban Ki-moon emphasized, “What counts now is translating promises on paper into change on the ground.” ❀

## ENDNOTES

- 1 Governance arrangements that can help adapt the SDGs into national and local circumstances are the subject of a recently released book by Zusman, Bengtsson and Olsen, 2015. See <http://pub.iges.or.jp/modules/envirolib/view.php?docid=6063>.
- 2 Biermann and Pattberg, 2012.
- 3 Puppim de Oliveira, 2013.
- 4 United Nations, 2015b.
- 5 See for example, ESCAP (2012) low carbon green growth road map. Available from [www.unescap.org/resources/low-carbon-green-growth-roadmap-asia-and-pacific](http://www.unescap.org/resources/low-carbon-green-growth-roadmap-asia-and-pacific).
- 6 Scoones and Newell, 2015.
- 7 Ibid.
- 8 Geels, 2013.
- 9 Hansen and Nygaard, 2013.
- 10 A review of case studies of fossil fuel subsidy reform found that the most common motivation was a combination of crises, particularly where the fiscal costs were so high that the government had no choice but to act. See Whitley and van der Burge, 2015.
- 11 Four years after it was proposed by the 2008 Renewable Energy Act. See WRI and WWF, 2013.
- 12 This refers to feed-in tariffs for biomass, which became operational in 2011, 20 years after it was first proposed in the context of a donor-funded project. See Hansen and Nygaard, 2013.
- 13 In the Philippines, the setting of tariffs was challenged by diverse groups (utilities officials, consumer groups and project developers) whose interests converge around the expectation that they would lose out if the tariffs were introduced. This led to an estimated \$2.5 billion loss in potential renewable energy investment. See WWF and WRI, 2013. In Malaysia, the lack of joint action by the groups that are expected to benefit from the introduction of the feed-in tariff for biomass is one of the reasons for the delay. See Hansen and Nygaard, 2013.
- 14 Rotmans and Fischer-Kowalski, 2009.
- 15 Zusman and others, 2015.
- 16 ESCAP and UN-Habitat, 2015.
- 17 Account of proceedings of the seventy-first session of the Economic and Social Commission for Asia and the Pacific (E/ESCAP/71/43).
- 18 Chafe and French, 2008.
- 19 Vandemoortele, 2011.
- 20 IGES, 2015.
- 21 Schandl, 2015.
- 22 Berkhout, Angel and Wieczorek, 2009.
- 23 Japan, Republic of Korea, Singapore and Australia are home to some of the world's leading universities. See Schandl, 2015.
- 24 See, for example, Rajul, 2015.
- 25 Hansen and Nygaard, 2013.
- 26 Lewis, 2013.
- 27 Schmitz, 2015 in Scoones and others, 2015.



## REFERENCES

- Akhtar, S. (2014). Landscape and State of Sustainable Financing, presentation for Asia-Pacific Outreach Meeting on Sustainable Development Financing, 10–11 June 2014 in Jakarta, Indonesia. Available from [www.unescap.org/resources/speech-landscape-and-state-sustainable-financing-dr-shamshad-akhtar-under-secretary](http://www.unescap.org/resources/speech-landscape-and-state-sustainable-financing-dr-shamshad-akhtar-under-secretary).
- Ali, I., and E.M. Pernia (2003). Infrastructure and Poverty Reduction-What is the Connection? *ERD Policy Brief Series No. 13*. Manila: Asian Development Bank. Available from <http://adb.org/sites/default/files/pub/2003/PB013.pdf>.
- Amsden, A.H. (2001). *The Rise of the Rest: Challenges to the West from Late-Industrializing Economies*. Oxford: Oxford University Press.
- Ananta, A., and others (2013). *The Environments of the Poor in South Asia: Simultaneously Reducing Poverty, Protecting the Environment, and Adapting to Climate Change*. Manila: Asian Development Bank. Available from [www.adb.org/sites/default/files/publication/42100/environments-poor-southeast-asia.pdf](http://www.adb.org/sites/default/files/publication/42100/environments-poor-southeast-asia.pdf).
- Asian Development Bank (2010). *The Rise of Asia's Middle Class: Key Indicators for Asia and the Pacific 2010*. Manila. Available from [www.adb.org/sites/default/files/publication/29792/rural-development-cambodia.pdf](http://www.adb.org/sites/default/files/publication/29792/rural-development-cambodia.pdf).
- \_\_\_\_\_ (2012). *Rural Development for Cambodia: Key Issues and Constraints*. Manila. Available from [www.adb.org/sites/default/files/publication/29792/rural-development-cambodia.pdf](http://www.adb.org/sites/default/files/publication/29792/rural-development-cambodia.pdf).
- \_\_\_\_\_ (2013). *Asia's Economic Transformation: Where To, How and How Fast: Key Indicators for Asia and the Pacific 2013 Special Chapter*. Manila. Available from [www.adb.org/sites/default/files/publication/30358/ki2013-special-chapter.pdf](http://www.adb.org/sites/default/files/publication/30358/ki2013-special-chapter.pdf).
- Asian Development Bank, World Wide Fund for Nature, and Global Footprint Network (2012). *Ecological Footprint and Investment in Natural Capital in Asia and the Pacific*. Manila and Geneva. Available from [www.footprintnetwork.org/images/article\\_uploads/ecological-footprint-asia-pacific-2012-final.pdf](http://www.footprintnetwork.org/images/article_uploads/ecological-footprint-asia-pacific-2012-final.pdf).
- Associated Press. (2015). Nestlé admits to forced labour in its seafood supply chain in Thailand. *The Guardian*, 24 November. Available from [www.theguardian.com/global-development/2015/nov/24/nestle-admits-forced-labour-in-seafood-supply-chain?CMP=share\\_btn\\_tw](http://www.theguardian.com/global-development/2015/nov/24/nestle-admits-forced-labour-in-seafood-supply-chain?CMP=share_btn_tw).
- Arcand, J., E. Berkes, and U. Panizza (2015). Too much finance? *Journal of Economic Growth*, vol. 20, No. 2, pp. 105–148.
- Argyris, C., and D. Schon (1978). *Organizational Learning: A Theory of Action Perspective*. Reading, Massachusetts: Addison Wesley.
- Ayres, R.U. (1996). Turning point: The end of the growth paradigm. *INSEAD Working Paper Series*. Fontainebleau, France: INSEAD. Available from [www.insead.edu/facultyresearch/research/doc.cfm?did=46742](http://www.insead.edu/facultyresearch/research/doc.cfm?did=46742).
- Australian Government Department of the Environment (2014). Repealing the carbon tax. Available from [www.environment.gov.au/climate-change/repealing-carbon-tax](http://www.environment.gov.au/climate-change/repealing-carbon-tax).
- Baker, D. (2014). Don't buy the 'sharing economy' hype: Airbnb and Uber are facilitating rip-offs. *The Guardian*, 27 May. Available from [www.theguardian.com/commentisfree/2014/may/27/airbnb-uber-taxes-regulation](http://www.theguardian.com/commentisfree/2014/may/27/airbnb-uber-taxes-regulation).
- Balea, J. (2014). Philippines weighs options for regulating Uber after public outcry against crackdown. *Tech in Asia*, 24 November. Available from [www.techinasia.com/uber-philippines-regulation/](http://www.techinasia.com/uber-philippines-regulation/).
- \_\_\_\_\_ (2015). Philippines becomes first country to create rules for ridesharing services such as Uber. *Tech in Asia*, 11 May. Available from [www.techinasia.com/philippines-regulations-transportation-network-companies-uber/](http://www.techinasia.com/philippines-regulations-transportation-network-companies-uber/).
- Berkhout, F., D. Angel, and A.J. Wiczorek (2009). Asian development pathways and sustainable socio-technical regimes. *Technological Forecasting and Social Change*, vol. 76, No. 2, pp. 218–228.
- Berg, A.G. and J.D. Ostry (2011). Inequality and unsustainable growth: Two sides of the same coin? *IMF Staff Discussion Note*. SDN/11/08. Available from [www.imf.org/external/pubs/ft/sdn/2011/sdn1108.pdf](http://www.imf.org/external/pubs/ft/sdn/2011/sdn1108.pdf).
- Biermann, F., and P.H. Pattberg (2012). *Global Environmental Governance Reconsidered*. Cambridge, Massachusetts: MIT press.
- Bing, X., and others (2015). A life cycle co-benefits assessment of wind power in China. *Renewable & Sustainable Energy Review*, vol. 41, pp. 338–346. Available from <http://dx.doi.org/10.1016/j.rser.2014.08.056>.

- Bluemling, B. and S. Yun (2016). Giving green teeth to the Tiger? A critique of green growth in South Korea. In *Green Growth: Ideology, Political Economy and the Alternatives*, G. Dale, M.V. Mathai and J.A. Puppim de Oliveira, eds. London: Zed Books.
- Bogardi, J., and others (2011). Water security for a planet under pressure: interconnected challenges of a changing world call for sustainable solutions. *Current Opinion in Environmental Sustainability*, vol. 4, pp. 1–9.
- Bollier, D., and S. Helfrich, eds. (2014). *The Wealth of the Commons: A World Beyond Market and State*. Amherst, Massachusetts: Levellers Press.
- Brand, U., and others (2013). Debating transformation in multiple crises. In *World Social Science Report 2013: Changing Global Environments*. Paris: Organisation for Economic Co-operation and Development and UNESCO Publishing. Available from <http://dx.doi.org/10.1787/9789264203419-90-en>.
- Brundtland Commission (1987). *Our Common Future: The World Commission on Environment and Development*. New York: United Nations.
- Bulkeley, H., and M.M. Betsill (2005). *Cities and Climate Change: Urban Sustainability and Global Environmental Governance*. Vol. 4. Oxford: Psychology Press.
- Building and Construction Authority (n.d.) Singapore Leading the Way for Green Buildings in the Tropics. Singapore. Available from [www.bca.gov.sg/greenmark/others/sg\\_green\\_buildings\\_tropics.pdf](http://www.bca.gov.sg/greenmark/others/sg_green_buildings_tropics.pdf).
- Carbon Market Data (n.d.). Kazakhstan ETS database. Available from <https://carbonmarketdata.com/en/products/world-ets-database/kazakhstan-ghg-co2-emissions-trading>.
- Carrillo, A.M.R. and C. Frei (2009). Water: A key resource in energy production. *Energy Policy*, vol. 37, Issue 11 (November), pp. 4303–4312.
- Catacutan, D.C., and J. Tanui (2007). *Engaging Stakeholders in Integrated Natural Resource Management: Approaches and Guidelines from Landcare*. Laguna, Philippines: World Agroforestry Center. Available from [www.worldagroforestry.org/downloads/Publications/PDFS/PP07154.pdf](http://www.worldagroforestry.org/downloads/Publications/PDFS/PP07154.pdf).
- Center for People and Forests (2013). Community Forestry in Asia and the Pacific: Pathway to Inclusive Development. Bangkok, RECOFT. Available from [www.recoftc.org/recoftc/download/16805/1628](http://www.recoftc.org/recoftc/download/16805/1628).
- Chafe, Z., and H. French (2008). Improving carbon markets. In *State of the World: Innovations for a Sustainable Economy*. Washington, D.C.: The WorldWatch Institute and W.W. Norton and Company, Inc.
- Chaudhuri, S. and M. Ravallion (2006). Partially awakened giants: Uneven growth in China and India. *World Bank Policy Research Working Paper*. No. 4069. Washington, D.C.: World Bank. Available from [www.wds.worldbank.org/servlet/WDSContentServer?WDSPIB/2006/11/17/000016406\\_2006111711\\_3609/Rendered/PDF/wps4069.pdf](http://www.wds.worldbank.org/servlet/WDSContentServer?WDSPIB/2006/11/17/000016406_2006111711_3609/Rendered/PDF/wps4069.pdf).
- Chan, K. (2015). Closing the gap: Reforming the investment landscape for green transformation. Contributing paper to the *Report on Transformations for Sustainable Development*. Available from [www.unescap.org/sites/default/files/RRSOED-Reforming-the-Investment-Landscape-for-Green-Transformation-by-Kiki-Chan.pdf](http://www.unescap.org/sites/default/files/RRSOED-Reforming-the-Investment-Landscape-for-Green-Transformation-by-Kiki-Chan.pdf).
- Chew, E. (2014). Malaysia green sukuk gets khazanah debut boost: Islamic finance. *Bloomberg*, 25 November. Available from [www.bloomberg.com/news/articles/2014-11-25/malaysia-green-sukuk-gets-khazanah-debut-boost-islamic-finance](http://www.bloomberg.com/news/articles/2014-11-25/malaysia-green-sukuk-gets-khazanah-debut-boost-islamic-finance).
- Center for International Forestry Research (2015). Clearing the smoke: The causes and consequences of Indonesia's fires. Available from <http://blog.cifor.org/37016/clearing-the-smoke-the-causes-and-consequences-of-indonesias-fires?fnl=en>.
- Clifford, M. (2015). *The Greening of Asia: The Business Case for Solving Asia's Environmental Emergency*. New York: Columbia University Press.
- Consumer Unity and Trust Society International (2010). Briefing paper: Analysing the Right to Information Act in India. Available from [www.cuts-international.org/cart/pdf/Analysing\\_the\\_Right\\_to\\_Information\\_Act\\_in\\_India.pdf](http://www.cuts-international.org/cart/pdf/Analysing_the_Right_to_Information_Act_in_India.pdf).
- Daly, H.E. (1997). *Beyond Growth: The Economics of Sustainable Development*. Boston: Beacon Press.
- \_\_\_\_\_ (2003). *Ecological Economics: The Concept of Scale and its Relation to Allocation, Distribution, and Uneconomic Growth*. Available from [www.greenoeconomics.net/2003HDaly.pdf](http://www.greenoeconomics.net/2003HDaly.pdf).
- Davies, G. (2015). The drain on China's foreign exchange reserves. *Financial Times*, 21 September. Available from <http://blogs.ft.com/gavyndavies/2015/09/21/the-drain-on-chinas-foreign-exchange-reserves/>.
- Davies, P.J. (2014). Asian century will dominate global financial markets. *Financial Times*, 7 April. Available from [www.ft.com/intl/cms/s/0/433bf1e4-be2a-11e3-b44a-00144feabdc0.html#axzz3nlx13037](http://www.ft.com/intl/cms/s/0/433bf1e4-be2a-11e3-b44a-00144feabdc0.html#axzz3nlx13037).

Ella, A., O.M. Paul, and O.S. Hoiberg (2014). Achieving Sustainable Development Goals (SDGs) through transformative governance practices and vertical collaboration at the national and subnational levels in Asia Pacific. *Summary of the SDplanNet-Asia Pacific Regional Workshop Series*, 7-9 April 2014 in Nairobi, Kenya. Available from [www.sdplannet-ap.org/Documents/sdplannet\\_asia\\_pacific.pdf](http://www.sdplannet-ap.org/Documents/sdplannet_asia_pacific.pdf).

Ernst & Young (2014). Rethinking private banking in Asia-Pacific. *EY Discussion Paper for Bank Executives*. Available from [www.ey.com/Publication/vwLUAssets/Rethinking\\_private\\_banking\\_in\\_Asia-Pacific/\\$File/Rethinking%20private%20banking%20in%20Asia-Pacific%20Web%20Version%20.pdf](http://www.ey.com/Publication/vwLUAssets/Rethinking_private_banking_in_Asia-Pacific/$File/Rethinking%20private%20banking%20in%20Asia-Pacific%20Web%20Version%20.pdf).

\_\_\_\_\_ (2015). *Megatrends 2015: Making Sense of a World in Motion*. Available from [www.ey.com/Publication/vwLUAssets/ey-megatrends-report-2015/\\$FILE/ey-megatrends-report-2015.pdf](http://www.ey.com/Publication/vwLUAssets/ey-megatrends-report-2015/$FILE/ey-megatrends-report-2015.pdf).

European Commission (n.d.). The EU ecolabel. Available from <http://ec.europa.eu/environment/ecolabel/>.

Fairtrade International (2014). *Strong Producers, Strong Future: Annual Report 2013-14*. Bonn, Germany: Fairtrade. Available from [www.fairtrade.net/fileadmin/user\\_upload/content/2009/resources/2013-14\\_AnnualReport\\_FairtradeIntl\\_web.pdf](http://www.fairtrade.net/fileadmin/user_upload/content/2009/resources/2013-14_AnnualReport_FairtradeIntl_web.pdf).

Fallow, B. (2014). Clock is ticking for cheap credits. *New Zealand Herald*, 5 August. Available from [www.nzherald.co.nz/business/news/article.cfm?c\\_id=3&objectid=11303894](http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11303894).

Felipe, J., A. Mehta, and C. Rhee (2014). Manufacturing matters... But it's the jobs that count. *ADB Economics Working Paper Series* No. 420. Manila: Asian Development Bank. Available from [www.adb.org/sites/default/files/publication/149984/ewp-420.pdf](http://www.adb.org/sites/default/files/publication/149984/ewp-420.pdf).

Fernando, N.A. (2008). Rural development outcomes and drivers: An overview and some lessons. *EARD Special Studies*. Manila: Asian Development Bank. Available from [www.ruralfinance.org/fileadmin/templates/rflc/documents/1205246415023\\_Rural\\_Development\\_Outcomes\\_Drivers.pdf](http://www.ruralfinance.org/fileadmin/templates/rflc/documents/1205246415023_Rural_Development_Outcomes_Drivers.pdf).

Field, C.B., and others (2012). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge, UK and New York: Cambridge University Press.

Figueiredo, P.N. (2001). *Technological learning and competitive performance*. Cheltenham, UK: Edward Elgar Publishing.

Fischer-Kowalski, M., and J. Rotmans (2009). Conceptualizing, observing, and influencing social-ecological transitions. *Ecology and Society*, vol. 14, No. 2, p. 3. Available from [www.ecologyandsociety.org/vol14/iss2/art3/](http://www.ecologyandsociety.org/vol14/iss2/art3/).

Fogarty, D. (2015). APP's bottom line takes a hit from Indonesia plantation fires. *The Strait Times*, 9 November. Available from [www.straittimes.com/asia/se-asia/apps-bottom-line-takes-a-hit-from-indonesia-plantation-fires](http://www.straittimes.com/asia/se-asia/apps-bottom-line-takes-a-hit-from-indonesia-plantation-fires).

Food and Agriculture Organization of the United Nations (FAO) (n.d.a). Gender and land rights database. Available from [www.fao.org/gender-landrights-database/en/](http://www.fao.org/gender-landrights-database/en/).

\_\_\_\_\_ (n.d.b). Right to Food around the Globe. Rome, FAO. Available from [www.fao.org/right-to-food-around-the-globe/en/](http://www.fao.org/right-to-food-around-the-globe/en/).

\_\_\_\_\_ (1999). Proceedings from the Committee on World Food Security, 25th Session: The Importance of Food Quality and Safety for Developing Countries. Rome.

\_\_\_\_\_ (2014a). *The State of World Fisheries and Aquaculture: Opportunities and Challenges*. Rome. Available from [www.fao.org/3/a-i3720e.pdf](http://www.fao.org/3/a-i3720e.pdf).

\_\_\_\_\_ (2014b). *State of the World's Forests 2014*. Rome. Available from [www.fao.org/3/a-i3710e/index.html](http://www.fao.org/3/a-i3710e/index.html).

\_\_\_\_\_ (2015a). *Regional Overview of Food Insecurity Asia and the Pacific: Towards a Food Secure Asia and the Pacific*. Bangkok. Available from [www.fao.org/3/a-i4624e.pdf](http://www.fao.org/3/a-i4624e.pdf).

\_\_\_\_\_ (2015b). *The State of Food Insecurity in the World: Meeting the 2015 International Hunger Targets: Taking Stock of Uneven Progress*. Rome. Available from [www.fao.org/3/a-i4646e.pdf](http://www.fao.org/3/a-i4646e.pdf).

Forest Trends, Katoomba Group, and United Nations Environment Programme (2008). *Payments for Ecosystem Services: Getting Started: A Primer*. Nairobi: UNEP. Available from [www.unep.org/pdf/PaymentsForEcosystemServices\\_en.pdf](http://www.unep.org/pdf/PaymentsForEcosystemServices_en.pdf).

Foster, J. (2011). Evolutionary macroeconomics: A research agenda. *Journal of Evolutionary Economics*, vol. 21, No. 1 (February), pp. 5–28. Available from <http://hdl.handle.net/10.1007/s00191-010-0187-z>.

Frankel, J. (2009). Environmental Effects of International Trade. Expert report No. 31. Stockholm: Globalisation Council. Available from [www.hks.harvard.edu/fs/jfrankel/Swenvirinlaga31proofs.pdf](http://www.hks.harvard.edu/fs/jfrankel/Swenvirinlaga31proofs.pdf).

- Frankfurt School–UNEP Collaborating Centre for Climate & Sustainable Energy Finance, Bloomberg New Energy Finance, and the United Nations Environment Programme (2015). *Global Trends in Renewable Energy Investment 2015*. Frankfurt: Frankfurt School. Available from [http://fs-unep-centre.org/sites/default/files/attachments/key\\_findings.pdf](http://fs-unep-centre.org/sites/default/files/attachments/key_findings.pdf).
- Freire, C. (2011). Productive capacities in Asia and the Pacific. *MPDD Working Papers* WP/11/17. Bangkok: Economic and Social Commission for Asia and the Pacific. Available from [www.unescap.org/sites/default/files/wp-11-17.pdf](http://www.unescap.org/sites/default/files/wp-11-17.pdf).
- Funge-Smith, S., M. Briggs, and W. Miao (2012). *Regional Overview of Fisheries and Aquaculture in Asia and the Pacific 2012*. Bangkok: Asia-Pacific Fishery Commission and FAO Regional Office for Asia and the Pacific. Available from [www.fao.org/docrep/017/i3185e/i3185e00.pdf](http://www.fao.org/docrep/017/i3185e/i3185e00.pdf).
- Freeman, C. (1982). *The Economics of Industrial Innovation*. London: Pinter.
- GIZ (2013). *Environmental Fiscal Reform: Case Studies*. Bonn and Eschborn, Germany: GIZ. Available from [www.giz.de/expertise/downloads/giz2013-en-environmental-fiscal-reform-case-studies.pdf](http://www.giz.de/expertise/downloads/giz2013-en-environmental-fiscal-reform-case-studies.pdf).
- Geels, F.W. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case study. *Research Policy*, vol. 31. No. 8/9, pp. 1257–1274.
- \_\_\_\_\_ (2005). Processes and patterns in transitions and system innovations: Refining the co-evolutionary multi-level perspective. *Technological Forecasting & Social Change*, vol. 72, pp. 681–696.
- Geels, F.W. (2013). The impact of the financial-economic crisis on sustainability transitions: Financial investment, governance and public discourse. *Environmental Innovation and Societal Transitions*, vol. 6, pp. 67–95.
- Gené, E.I., H. Scheyvens, and F. López-Casero (2012). Community forest management and REDD+: Opportunities and challenges. In *Greening Governance in Asia-Pacific*, P. King, and others. IGES White Paper IV. Hayama, Japan: Institute for Global Environmental Strategies, pp. 85–114. Available from [http://enviroscope.iges.or.jp/modules/envirolib/upload/4014/attach/Chapter\\_5\\_E.pdf](http://enviroscope.iges.or.jp/modules/envirolib/upload/4014/attach/Chapter_5_E.pdf).
- Global Alliance for Clean Cookstoves (2015). Women spend 374 hours each year collecting firewood in India, study finds. Available from <http://cleancookstoves.org/about/news/05-05-2015-women-spend-374-hours-each-year-collecting-firewood-in-india-study-finds.html>.
- Gurria, A. (2012, March). The Green growth challenge: No nature, no water, no growth. Speech delivered at the 6th World Water Forum Marseille, France.
- Hansen, U.E., and I. Nygaard (2013). Transnational linkages and sustainable transitions in emerging countries. *Environmental Innovation and Societal Transitions*, vol. 8, pp. 1–19.
- Hansen, M.C., and others (2013). High-resolution global maps of 21st-century forest cover change. *Science*, vol. 342, No. 6160, pp. 850–853.
- Hanstad, T., and R. Prosterman (2014). How the poor get washed away. *New York Times*, 14 January. Hardin, G. (1968). The tragedy of the commons. *Science*, vol. 162, No. 3859 (December), pp. 1243–1248.
- Hardin, R. (1982). *Collective Action*. Baltimore: Johns Hopkins University Press.
- Herrendorf, B., R. Rogerson, and Á. Valentinyi (2013). Growth and structural transformation. *NBER Working Paper* No. 18996. Cambridge, Massachusetts, National Bureau of Economic Research. Available from [www.nber.org/papers/w18996.pdf](http://www.nber.org/papers/w18996.pdf).
- Hoff, H. (2011). The water, energy and food security nexus: Understanding the nexus.' Background Paper for the Bonn2011 Conference. Stockholm: Stockholm Environment Institute.
- Hoffmann, U. (2016). Can green growth really work? A reality check that elaborates on the true (socio-) economics of climate change. In *Green Growth: Ideology, Political Economy and the Alternatives*, G. Dale, M.V. Mathai and J.A. Puppim de Oliveira, eds. London: Zed Books.
- Hsu, A., and others. (2014). *The 2014 Environmental Performance Index*. New Haven, Connecticut: Yale Center for Environmental Law & Policy. Available from [www.epi.yale.edu](http://www.epi.yale.edu).
- Ikeda, D. (2015). A shared pledge for a more humane future: To eliminate misery from the Earth. Available from [www.sgi.org/content/files/about-us/president-ikedas-proposals/peaceproposal2015.pdf](http://www.sgi.org/content/files/about-us/president-ikedas-proposals/peaceproposal2015.pdf).
- Institute for Global Environmental Strategies (2015). Greening integration in Asia: How regional integration can benefit people and the environment. *IGES White Paper V*. Hayama, Japan: IGES. Available from [http://pub.iges.or.jp/modules/envirolib/upload/6046/attach/IGESWhitePaperV2015\\_eng\\_web.pdf](http://pub.iges.or.jp/modules/envirolib/upload/6046/attach/IGESWhitePaperV2015_eng_web.pdf).

- International Council for Science (n.d.). Oceans Acidification, expert assessment launched at UNFCCC COP-19. Available from [www.icsu.org/news-centre/news/top-news/expert-assessment](http://www.icsu.org/news-centre/news/top-news/expert-assessment).
- Intergovernmental Panel on Climate Change (2012). Summary for policymakers. In *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*, C.B. Field, and others, eds. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge, UK and New York, Cambridge University Press, pp. 1–19.
- International Energy Agency (2011). *Energy for All: Financing Access for the Poor—A Special Early Excerpt of the World Energy Outlook 2011*. Paris: Organisation for Economic Co-operation and Development and IEA.
- International Energy Agency (2014). *The world energy outlook 2014*. Electricity access database. Available from [www.worldenergyoutlook.org/media/weoweb/site/WEO2014Electricitydatabase1.xlsx](http://www.worldenergyoutlook.org/media/weoweb/site/WEO2014Electricitydatabase1.xlsx).
- International Institute for Sustainable Development (2015). *Financing the Sustainable Development Goals through Fossil-fuel Subsidy Reform: Opportunities in Southeast Asia, India and China*. Winnipeg, Canada.
- International Institute for Sustainable Development and Development Research Center of the State Council of the People's Republic of China (2015). *Greening China's Financial System*. Winnipeg, Canada. Available from [www.iisd.org/publications/greening-chinas-financial-system](http://www.iisd.org/publications/greening-chinas-financial-system).
- International Monetary Fund (2014). *Global Financial Stability Report: Moving from Liquidity to Growth Driven Markets*. Washington, D.C. Available from [www.imf.org/external/pubs/FT/GFSR/2014/01/pdf/text.pdf](http://www.imf.org/external/pubs/FT/GFSR/2014/01/pdf/text.pdf).
- International Fund for Agricultural Development (2006). *Community-Based Natural Resource Management: How Knowledge is Managed, Disseminated and Used*. Rome. Available from [www.ifad.org/pub/other/cbnrm.pdf](http://www.ifad.org/pub/other/cbnrm.pdf).
- International Organization for Migration (2011). Trafficking of Fishermen in Thailand. Bangkok. Available from [www.iom.int/jahia/webdav/shared/shared/mainsite/activities/countries/docs/thailand/Trafficking-of-Fishermen-Thailand.pdf](http://www.iom.int/jahia/webdav/shared/shared/mainsite/activities/countries/docs/thailand/Trafficking-of-Fishermen-Thailand.pdf).
- Jackson, T. (2009). *Prosperity Without Growth – Economics for a Finite Planet*. London: Earthscan.
- \_\_\_\_\_ (2011). Philosophical and social transformations necessary for the green economy. Background paper for the Economic and Social Survey 2011. Draft.
- Joshi, R.G. (2015). Fostering transformation through the mobilization of grassroots innovations. Contributing piece for *Transformations for Sustainable Development in Asia and the Pacific*. Bangkok: Economic Social Commission for Asia and the Pacific. Available from [www.unescap.org/sites/default/files/RRSOED-Fostering-transformation-through-the-mobilization-of-grassroots-innovations-by-Rajul-G.-Joshi.pdf](http://www.unescap.org/sites/default/files/RRSOED-Fostering-transformation-through-the-mobilization-of-grassroots-innovations-by-Rajul-G.-Joshi.pdf).
- Kanbur, R., and J. Zhuang (2013). Urbanization and inequality in Asia. *Asian Development Review*, vol. 30, No. 1, pp.131–147. Available from [www.kanbur.dyson.cornell.edu/papers/UrbanizationAndInequalityInAsia.pdf](http://www.kanbur.dyson.cornell.edu/papers/UrbanizationAndInequalityInAsia.pdf).
- Kanbur, R., C. Rhee, and J. Zhuang (2014). *Inequality in Asia and the Pacific: Trends, Drivers, and Policy Implications*. Manila and Oxford: Asian Development Bank and Routledge. Available from [www.adb.org/sites/default/files/publication/41630/inequality-asia-and-pacific.pdf](http://www.adb.org/sites/default/files/publication/41630/inequality-asia-and-pacific.pdf).
- Kawa, L. (2015). Why capital outflows from China may be no cause for alarm. *Bloomberg*, 1 August. Available from [www.bloomberg.com/news/articles/2015-07-31/why-capital-outflows-from-china-may-be-no-cause-for-alarm](http://www.bloomberg.com/news/articles/2015-07-31/why-capital-outflows-from-china-may-be-no-cause-for-alarm).
- Kepli, S. (2015). Economic Planning Unit, Prime Minister's Department, Federal Government of Malaysia, email to ESCAP, 31 December.
- Keruwala, N. (2013). Participatory budgeting in India: The Pune experiment. *The fifth edition of the Budget Bulletin* (June–August). New Delhi: National Foundation for India. Available from <http://janwani.org/site/wp-content/uploads/2013/07/THE-BUDGET-BULLETIN.pdf>.
- Khotari, A. (2016). Beyond 'development' and 'growth': Lessons from India for a sustainable and equitable world. In *Green Growth: Ideology, Political Economy and the Alternatives*, G. Dale, M.V. Mathai and J.A. Puppim de Oliveira, eds. London: Zed Books.
- Korea Energy Economics Institute (2013). *Energy Info Korea*. Gyeonggido, Korea. In Korean. Available from [www.keei.re.kr](http://www.keei.re.kr).
- KPMG International (2012). *Investment in Mongolia*. Amstelveen, Netherlands. Available from [www.kpmg.com/MN/en/IssuesAndInsights/ArticlesPublications/Investment-2012/Documents/InvestmentInMongolia2012.pdf](http://www.kpmg.com/MN/en/IssuesAndInsights/ArticlesPublications/Investment-2012/Documents/InvestmentInMongolia2012.pdf).
- KPMG International (2013). *The KPMG Survey of Corporate Responsibility Reporting 2013*. Amstelveen, Netherlands: Global Center of Excellence for Climate Change & Sustainability. Available from <https://assets.kpmg.com/content/dam/kpmg/pdf/2015/08/kpmg-survey-of-corporate-responsibility-reporting-2013.pdf>.



- Kuo, D. (2011). Water, food, energy...the very basic needs of seven billion souls. *The Independent*, 6 November. Available from [www.independent.co.uk/money/spend-save/david-kuo-water-food-energythe-very-basic-needs-of-seven-billion-souls-6257761.html](http://www.independent.co.uk/money/spend-save/david-kuo-water-food-energythe-very-basic-needs-of-seven-billion-souls-6257761.html)
- Kwack, S.Y., and Y.S. Lee (1982). Historical transformation and prospects of the Korean economy. *Economic Planning, Part 3*, pp. 358–393.
- Leigh, A (2015). Sharing the benefits of the sharing economy: The challenges of getting the rules right. Asia and the Pacific Policy Society Policy Forum. Available from [www.policyforum.net/sharing-benefits-sharing-economy/#sthash.8Y8GNjVD.dpuf](http://www.policyforum.net/sharing-benefits-sharing-economy/#sthash.8Y8GNjVD.dpuf).
- Lenzen, M., and others (2014). International trade drives biodiversity threats in developing countries. *Nature*, vol. 486, pp. 109–112.
- Lewis, J.I. (2013). *Green Innovation in China: China's Wind Power Industry and the Global Transition to a Low-Carbon Economy*. New York: Columbia University Press.
- Liz, M. (2007). The tides are getting higher and higher: A Pacific voice on climate change. *Just Change*, vol. 10, pp. 22–23.
- Llanto, G.M. (2012). The Impact of Infrastructure on Agricultural Productivity. *PIDS Discussion Paper Series No. 1012-12*. Manila: Philippines Institute for Development Studies. Available from <http://dirp4.pids.gov.ph/ris/dps/pidsdps1212.pdf>.
- Losch, B., S. Fréguin-Gresh, and E.T. White (2012). *Structural Transformation and Rural Change Revisited: Challenges for Late Developing Countries in a Globalizing World*. Washington, D.C.: World Bank Publications. Available from <http://elibrary.worldbank.org/doi/pdf/10.1596/978-0-8213-9512-7>. Lundvall, B. (1988). *Innovation as an Interactive Process: From User-Producer Interaction to the National System of Innovation: Technical Change and Economic Theory*. London: Pinter.
- Martinez-Alier, J., L. Temper, and F. Demaria (2016). 'Social metabolism and environmental conflicts: A comparison between India and Latin America.' In *Green Growth: Ideology, Political Economy and the Alternatives*, G. Dale, M.V. Mathai and J.A. Puppim de Oliveira, eds. London: Zed Books.
- Maslow, A.H. (1943). A theory of human motivation. *Psychological Review*, vol. 50, No. 4, pp. 370–396.
- McKinsey Global Institute (2012). *Urban World: Cities and the Rise of the Consuming Class*. Available from [www.mckinsey.com/insights/urbanization/urban\\_world\\_cities\\_and\\_the\\_rise\\_of\\_the\\_consuming\\_class](http://www.mckinsey.com/insights/urbanization/urban_world_cities_and_the_rise_of_the_consuming_class).
- McMillan, M.S., and D. Rodrik (2011). Globalization, structural change and productivity growth. *NBER Working Paper No. 17143* (June). Cambridge, Massachusetts: National Bureau of Economic Research. Available from [www.nber.org/papers/w17143.pdf](http://www.nber.org/papers/w17143.pdf).
- Meadowcroft, J. (2011). Engaging with the politics of sustainability transitions. *Environmental Innovation and Societal Transitions*, vo. 1, No. 1, pp. 70–75.
- Meadows, D.H., D.L. Meadows, and J. Randers (1972). *The Limits to Growth: A Report to the Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books.
- Millennium Ecosystem Assessment (2005). Available from [www.millenniumassessment.org](http://www.millenniumassessment.org).
- Merican, Ali. Economic Planning Unit, Prime Minister's Department, Federal Government of Malaysia, email to ESCAP, 31 December 2015.
- Mezirow, J. (2000). *Learning as Transformation: Critical Perspectives on a Theory in Progress*. New York: Jossey-Bass.
- Mohammed, E.Y., S. Wang, and G. Kawaguchi (2013). Making growth green and inclusive: The case of Cambodia. *OECD Green Growth Papers*, September. Paris: OECD Publications. Available from [www.oecd-ilibrary.org/docserver/download/5k420651szzr.pdf?expires=1444187821&id=id&accname=guest&checksum=B53F960282B8E60A382F046A111B3925](http://www.oecd-ilibrary.org/docserver/download/5k420651szzr.pdf?expires=1444187821&id=id&accname=guest&checksum=B53F960282B8E60A382F046A111B3925)
- Mulder, I., K. ten Kate, and S. Scherr (2006). Private sector demand in markets for ecosystem services: preliminary findings. Adapted from full report submitted to the UNDP-GEF project: Institutionalizing Payments for Ecosystem Services, supplement III. Mobilizing Private Sector Buyers for Ecosystem Services. Available from [www.fsd.nl/downloadattachment/72341/60533/pri-](http://www.fsd.nl/downloadattachment/72341/60533/pri-)
- National Pro Bono Resource Center (2011). What is social justice? *Occasional Paper No.1* (October). Sydney. Available from [www.nationalprobono.org.au/ssl/CMS/files\\_cms/Occ\\_1\\_What%20is%20Social%20Justice\\_FINAL.pdf](http://www.nationalprobono.org.au/ssl/CMS/files_cms/Occ_1_What%20is%20Social%20Justice_FINAL.pdf).
- Nelson, R.R. (1993). *National Innovation Systems: A Comparative Analysis*. New York and London: Oxford University Press.
- Newell, P. (2005). Race, class and the global politics of environmental inequality. *Global Environmental Politics*, vol. 5, No. 3 (August), pp. 70–93.

- Nielsen (2014). Asia Pacific consumers embrace the share economy. Available from [www.nielsen.com/apac/en/insights/news/2014/asia-pacific-consumers-embrace-the-share-economy.html](http://www.nielsen.com/apac/en/insights/news/2014/asia-pacific-consumers-embrace-the-share-economy.html).
- O'Brien, K. (2012). Global environmental change: From adaptation to deliberate transformation. *Progress in Human Geography*, vol. 36, No. 5, pp. 667–676.
- Ong, Y. (2014). South-East Asia's sharing economy start-ups may produce the next Airbnb or Uber. *Forbes*, 23 June. Available from [www.forbes.com/sites/yunitaong/2014/06/23/southeast-asias-sharing-economy-start-ups-may-produce-the-next-airbnb-or-uber/](http://www.forbes.com/sites/yunitaong/2014/06/23/southeast-asias-sharing-economy-start-ups-may-produce-the-next-airbnb-or-uber/).
- Organisation for Economic Co-operation and Development (2005). *Oslo Manual: Guidelines for collecting and interpreting innovation data*. Paris.
- \_\_\_\_\_ (2013). *Southeast Asian Economic Outlook 2013: With Perspectives on China and India*. Paris. Available from [www.oecd.org/dev/asia-pacific/Pocket%20Edition%20SAEO2013.pdf](http://www.oecd.org/dev/asia-pacific/Pocket%20Edition%20SAEO2013.pdf).
- Ostrom, E. (2010a). Beyond markets and states: polycentric governance of complex economic systems. *The American Economic Review*, vol. 100, pp. 641–672.
- \_\_\_\_\_ (2010b). Polycentric systems for coping with collective action and global environmental change. *Global Environmental Change*, vol. 20, No. 4, pp. 550–557.
- Oxfam America (n.d.). The truth about land grabs. Available from [www.oxfamamerica.org/take-action/campaign/food-farming-and-hunger/land-grabs/](http://www.oxfamamerica.org/take-action/campaign/food-farming-and-hunger/land-grabs/).
- Phillips, J. and P. Newell (2013). The governance of clean energy in India: The Clean Development Mechanism (CDM) and domestic energy politics. *Energy Policy*, vol. 59, pp. 654–662.
- Point Carbon (2012). Viet Nam sets CO2 target, plans trading scheme. (24 September). Available from [www.pointcarbon.com/news/1.1997896](http://www.pointcarbon.com/news/1.1997896).
- \_\_\_\_\_ (2014). First exchange deals open Kazakhstan carbon market. (31 May). Available from [www.pointcarbon.com/news/1.1997896](http://www.pointcarbon.com/news/1.1997896).
- Polanyi, K. (1944). *The Great Transformation: The Political and Economic Origins of Our Time*. Boston, Massachusetts: Beacon Press.
- Puppim de Oliveira, J.A. (2013). Learning how to align climate, environmental and development objectives in cities: Lessons from the implementation of climate co-benefits initiatives in urban Asia. *Journal of Cleaner Production*, vol. 58, pp. 7–14.
- \_\_\_\_\_ (2014). The mismatch of implementation networks in international environmental regimes: Lessons from different agreements. In *Improving Global Environmental Governance: Best Practices for Architecture and Agency*, N. Kanie, P.M. Haas and S. Andersen, eds. New York: Routledge, pp. 108–129.
- \_\_\_\_\_ with Dale, G. and Mathai, M. V. (2016). *Green Growth: Ideology, Political Economy and Alternatives*. London: Zed Books.
- PwC (2014). *Asset Management 2020: A Brave New World*. Available from [www.pwc.com/gx/en/asset-management/publications/pdfs/pwc-asset-management-2020-a-brave-new-world-final.pdf](http://www.pwc.com/gx/en/asset-management/publications/pdfs/pwc-asset-management-2020-a-brave-new-world-final.pdf).
- Quah, E. and T.T. Siong (2015). When the haze doesn't go away. *The Strait Times*, 22 September. Available from [www.straitstimes.com/opinion/when-the-haze-doesnt-go-away](http://www.straitstimes.com/opinion/when-the-haze-doesnt-go-away).
- Ravillion, M. (2013). How long will it take to lift one billion people out of poverty? *The World Bank Research Observer*, vol. 28, No. 2. Available from: <http://elibrary.worldbank.org/doi/pdf/10.1093/wbro/lkt003>.
- Radio Free Asia (n.d.). Asia's great land grab. Available from [www.rfa.org/english/news/special/landgrab/home.html](http://www.rfa.org/english/news/special/landgrab/home.html)
- Rahman, M. (2015). Multiple-stakeholder participation in the governance of nature's use – lessons from Bangladesh. Presentation at International Union of Conservation of Nature Asia Regional Conservation Forum on 11 August 2015.
- Read, M.S. (2008). Stakeholder Participation for Environmental Management: A Literature Review. *Biological Conservation*, vol. 141, No. 10, pp. 2417–2431.
- Reid, H. (2015). Ecosystem and community-based adaptation: Learning from community-based natural resource management. *Climate and Development*. Available from <http://dx.doi.org/10.1080/17565529.2015.1034233>.

- Reid, H., and others (2009). Community-based adaptation to climate change. *Participatory Learning and Action* 60. London: International Institute for Environment and Development, pp. 11–33.
- Reuters (2013). Indonesia to launch voluntary carbon market. (12 November). Available from [www.reuters.com/article/2013/11/12/indonesia-carbon-climate-idUSL4N0IX4S920131112](http://www.reuters.com/article/2013/11/12/indonesia-carbon-climate-idUSL4N0IX4S920131112).
- \_\_\_\_\_ (2014). Australian parliament repeals carbon tax, emissions trading scheme. (17 July). Available from [www.reuters.com/article/2014/07/18/us-australia-carbon-vote-idUSKBN0FM04J20140718](http://www.reuters.com/article/2014/07/18/us-australia-carbon-vote-idUSKBN0FM04J20140718).
- Rodríguez, L.C., and others (2011). Towards a unified scheme for environmental and social protection: Learning from PES and CCT experiences in developing countries. *Ecological Economics*, vol. 70, No. 11 (September), pp. 2163–2174.
- Rodrik, D. (2015). Premature deindustrialization. *NBER Working Paper* No. 20935. Cambridge, Massachusetts: National Bureau of Economic Research. Available from: [www.nber.org/papers/w20935#navDiv=6](http://www.nber.org/papers/w20935#navDiv=6).
- Roppongi, H., A. Suwa, and J.A. Puppim de Oliveira (2016). Innovating in climate policy. *Climate Policy*, forthcoming.
- Rotmans, J., and M. Fischer-Kowalski (2009). Conceptualizing, observing and influencing socio-ecological transitions. *Ecology and Society*, vol. 14, No. 2 (article 3), pp. 1–18. Available from [www.ecologyandsociety.org/vol14/iss2/art3/](http://www.ecologyandsociety.org/vol14/iss2/art3/).
- Schandl, H. (2015). Vulnerabilities and Risks Related to Supply Security and Environmental and Social Impacts of Natural Resource Use: Policy Responses to Enhance Sustainable Resource Use and Resource Efficiency in Asia and the Pacific. Bangkok: Economic and Social Commission for Asia and the Pacific.
- Schandl, H., and others (2015). *Indicators for a Resource Efficient and Green Asia and the Pacific - Measuring Progress of Sustainable Consumption and Production, Green Economy and Resource Efficiency Policies in the Asia-Pacific Region*. Bangkok: United Nations Environment Programme. Available from [http://greeninfo.asia/Publications/Indicator-for-a-RE\(Low-resolution\).pdf](http://greeninfo.asia/Publications/Indicator-for-a-RE(Low-resolution).pdf).
- Schmitz, H. (2015). Green transformation: Is there a fast track? In *The Politics of Green Transformations*, I. Scoones, M. Leach, and P. Newell, eds. Oxford: Routledge, pp. 170–188.
- Schor, J. (2014). *Debating the Sharing Economy: Great Transition Initiative Essay*. Boston, Massachusetts: Tellus Institute. Available from [www.greattransition.org/images/GTI\\_publications/Schor\\_Debating\\_the\\_Sharing\\_Economy.pdf](http://www.greattransition.org/images/GTI_publications/Schor_Debating_the_Sharing_Economy.pdf).
- Scoones, I., M. Leach, and P. Newell, eds. (2015). *The Politics of Green Transformations*. Oxford: Routledge.
- Sen, A. (2008). The idea of justice. *Journal of Human Development*, vol. 9, No. 3 (November), pp. 331–342.
- Setegn, S.G., and M.C. Donoso, eds. (2015). *Sustainability of Integrated Water Resources Management: Water Governance, Climate and Ecohydrology*. New York: Springer.
- Sethi, M. and J. A. Puppim de Oliveira. (2016a). From global ‘North–South’ to local ‘urban–rural: A shifting paradigm in climate governance?’ *Urban Climate*, forthcoming.
- Sethi, M. and J. A. Puppim de Oliveira, eds. (2016b). *Cities and Climate Co-benefits: Urban Innovations and Reforms in India*. New Delhi: Sage Press, forthcoming.
- Shah, A., and others, eds. (2007). Participatory budgeting. *Public Sector Governance and Accountability Series*. Washington, D.C.: World Bank Publications. Available from <http://siteresources.worldbank.org/PSGLP/Resources/ParticipatoryBudgeting.pdf>.
- Shah, V. (2015). Realising the potential of Singapore’s sharing economy. *Singapore Business News*, 21 May. Available from [www.edb.gov.sg/content/edb/en/news-and-events/news/singapore-business-news/Industry/realising-the-potential-of-singapores-sharing-economy.html](http://www.edb.gov.sg/content/edb/en/news-and-events/news/singapore-business-news/Industry/realising-the-potential-of-singapores-sharing-economy.html).
- Singh, R.K. (2015). Renewables projects included in India’s priority sector lending. *Bloomberg*, 24 April. Available from [www.bloomberg.com/news/articles/2015-04-23/rbi-widens-scope-of-priority-sector-lending-to-add-renewables](http://www.bloomberg.com/news/articles/2015-04-23/rbi-widens-scope-of-priority-sector-lending-to-add-renewables).
- Smith, R. (2014). Beyond growth or beyond capitalism? *Truthout*, 15 January. Available from [www.truth-out.org/news/item/21215-beyond-growth-or-beyond-capitalism#](http://www.truth-out.org/news/item/21215-beyond-growth-or-beyond-capitalism#).
- Steffen, W., and others (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, vol. 347, No. 6223 (February). Available from [www.sciencemag.org/content/347/6223/1259855](http://www.sciencemag.org/content/347/6223/1259855).
- Stoddart, H., and E. W. Cruickshank, eds. (2012). *Pocket Guide to Sustainable Development Governance*. Available from [www.stakeholderforum.org/fileadmin/files/PocketGuidetoSDGEdition2webfinal.pdf](http://www.stakeholderforum.org/fileadmin/files/PocketGuidetoSDGEdition2webfinal.pdf).
- Sunderlin, W.D., J. Hatcher, and M. Liddle (2008). *From Exclusion to Ownership? Challenges and Opportunities in Advancing Forest Tenure Reform*. Washington, D.C.: Rights and Resources Initiative.

Sustainable Energy for All (n.d.). Asia-Pacific hub. Available from [www.se4all.org/hubs/asia-pacific-hub/](http://www.se4all.org/hubs/asia-pacific-hub/).

Swilling, M., and others (2013). City-Level Decoupling: Urban resource flows and the governance of infrastructure transitions. A Report of the Working Group on Cities of the International Resource Panel. Nairobi: United Nations Environment Programme. Available from [www.unep.org/resourcepanel/portals/24102/pdfs/Cities-Full\\_Report.pdf](http://www.unep.org/resourcepanel/portals/24102/pdfs/Cities-Full_Report.pdf).

Thailand Greenhouse Gas Management Organization (2013). Progress on the Development of a Voluntary Carbon Market in Thailand. Available from [www.iges.or.jp/files/research/climate-energy/mm/PDF/20130904/S5\\_2\\_Sumon.pdf](http://www.iges.or.jp/files/research/climate-energy/mm/PDF/20130904/S5_2_Sumon.pdf).

The Climate Group (2013). Carbon pricing. Available from [http://thecleanrevolution.org/\\_assets/files/May-Insight-Briefing---Carbon-Pricing.pdf](http://thecleanrevolution.org/_assets/files/May-Insight-Briefing---Carbon-Pricing.pdf).

Thi, H.H.P. (2014). *Intra-Regional Trade and Income Inequality: Where Do We Stand?* Nantes, France, Laboratoire d'Economie et de Management Nantes-Atlantique Université de Nantes. Available from <https://hal.inria.fr/hal-01087366/document>.

Tongson, E. and T. Balasinorwala (2010). Payment for ecosystem services, Sibuyan Island, Philippines. The Economics of Ecosystems & Biodiversity and United Nations Environment Programme. Available from <http://doc.teebweb.org/wp-content/uploads/2013/01/Payment-for-Ecosystem-Services-Sibuyan-Island-Phillipines.pdf>.

Tschakert, P., and K.A. Dietrich (2010). Anticipatory learning for climate change adaptation and resilience. *Ecology and Society*, vol. 15, No. 2, p. 11. Available from [www.ecologyandsociety.org/vol15/iss2/art11/](http://www.ecologyandsociety.org/vol15/iss2/art11/).

Tujan, A., ed. (2008). *People & Planet Over Profits: People's Sovereignty Over Natural Resources*. Quezon City, Philippines: Asia Pacific Research Network.

Um, V. (2015). *A Study on Type Status and Effect of Residents' Participatory Budget System: In Case of Self-Governing Districts*. Gwangju, Republic of Korea: Chonnam National University Graduate School of Public Administration. Available from <http://lib.jnu.ac.kr/search/detail/CATTOT000013610528>.

United Nations (n.d.). Treaty collection. Available from [https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg\\_no=XXVII-13&chapter=27&lang=en](https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-13&chapter=27&lang=en).

\_\_\_\_\_ (1948). Universal Declaration of Human Rights. Retrieved from [www.un.org/en/documents/udhr/](http://www.un.org/en/documents/udhr/).

\_\_\_\_\_ (2011). *The Millennium Development Goals Report 2011—Addendum: Goal 1*. Available from [http://unstats.un.org/unsd/mdg/Resources/Static/Products/Progress2011/Addendum\\_G1.pdf](http://unstats.un.org/unsd/mdg/Resources/Static/Products/Progress2011/Addendum_G1.pdf).

\_\_\_\_\_ (2014). *The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet. Synthesis Report of the Secretary-General on the Post-2015 Agenda*. Sales No. A/69/700. Available from [www.un.org/ga/search/view\\_doc.asp?symbol=A/69/700&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/69/700&Lang=E).

\_\_\_\_\_ (2015a). Resolution A/RES/70/1 adopted by the General Assembly at its Seventieth session on 25 September 2015. Transforming our world: the 2030 Agenda for Sustainable Development. Available from <https://sustainabledevelopment.un.org/post2015/transformingourworld>.

\_\_\_\_\_ (2015b). *The Global Sustainable Development Report, 2015 edition*. Available from <https://sustainabledevelopment.un.org/globalsdreport/2015>.

\_\_\_\_\_ (2015c). *The Millennium Development Goal Report 2015*. New York. Available from [www.un.org/millenniumgoals/2015\\_MDG\\_Report/pdf/MDG%202015%20rev%20\(July%2015\).pdf](http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%2015).pdf).

\_\_\_\_\_ (2015d). Transforming our world: The 2030 Agenda for Sustainable Development. Resolution adopted by the General Assembly, Seventieth session (A/RES/70/1) (25 September). Available from [www.un.org/pga/wp-content/uploads/sites/3/2015/08/120815\\_outcome-document-of-Summit-for-adoption-of-the-post-2015-development-agenda.pdf](http://www.un.org/pga/wp-content/uploads/sites/3/2015/08/120815_outcome-document-of-Summit-for-adoption-of-the-post-2015-development-agenda.pdf).

United Nations Conference on Trade and Development (UNCTD) (2013). *The Least Developed Countries Report 2013: Growth with Employment for Inclusive and Sustainable Development*. Sales No. E.13.II.D1. Available from [http://unctad.org/en/PublicationsLibrary/ldc2013\\_en.pdf](http://unctad.org/en/PublicationsLibrary/ldc2013_en.pdf).

United Nations Development Programme (UNDP) (2004). *Decentralised Governance for Development: A Combined Practice Note on Decentralisation, Local Governance and Urban/Rural Development*. New York. Available from [www.undp.org/content/dam/aplaws/publication/en/publications/democratic-governance/dg-publications-for-website/decentralised-governance-for-development-a-combined-practice-note-on-decentralisation-local-governance-and-urban-rural-development/DLGUD\\_PN\\_English.pdf](http://www.undp.org/content/dam/aplaws/publication/en/publications/democratic-governance/dg-publications-for-website/decentralised-governance-for-development-a-combined-practice-note-on-decentralisation-local-governance-and-urban-rural-development/DLGUD_PN_English.pdf).

\_\_\_\_\_ (2011). *Towards Human Resilience: Sustaining MDG Progress in an Age of Economic Uncertainty*. New York: Bureau for Development Policy. Available from [www.undp.org/content/dam/undp/library/Poverty%20Reduction/Towards\\_SustainingMDG\\_Web1005.pdf](http://www.undp.org/content/dam/undp/library/Poverty%20Reduction/Towards_SustainingMDG_Web1005.pdf).

United Nations Economic and Social Commission for Asia and the Pacific (n.d.). ESCAP statistical database. Available from [www.unescap.org/stat/data/statdb/DataExplorer.aspx](http://www.unescap.org/stat/data/statdb/DataExplorer.aspx).

\_\_\_\_\_ (n.d.) ESCAP Asia Pacific Energy Portal. Available from <http://asiapacificenergy.org/>.

\_\_\_\_\_ (2010). *Financing an Inclusive and Green Future: A Supportive Financial System and Green Growth for Achieving the Millennium Development Goals in Asia and the Pacific*. Sales No.E.10.II.F.4.

\_\_\_\_\_ (2011). *Statistical Yearbook for Asia and the Pacific 2011*. Sales No. E.11.II.F.1.

\_\_\_\_\_ (2013a). *Shifting from Quantity to Quality: Growth with Equality, Efficiency, Sustainability and Dynamism* (ST/ESCAP/2675). Available from [www.unescap.org/sites/default/files/Shifting%20from%20quantity%20to%20quality%20Growth%20with%20equality%2C%20efficiency%2C%20sustainability%20and%20dynamism.pdf](http://www.unescap.org/sites/default/files/Shifting%20from%20quantity%20to%20quality%20Growth%20with%20equality%2C%20efficiency%2C%20sustainability%20and%20dynamism.pdf).

\_\_\_\_\_ (2013b). *Statistical Yearbook for Asia and the Pacific 2013*. Bangkok.

\_\_\_\_\_ (2014a). *Asia Pacific Trade and Investment Report 2014*. Bangkok.

\_\_\_\_\_ (2014b). Balancing the three dimensions of sustainable development: from integration to implementation. Note by the secretariat. Asia-Pacific Forum on Sustainable Development, 21-22 May 2015. E/ESCAP/FSD(2)/1. Available from [www.un.org/ga/search/view\\_doc.asp?symbol=E/ESCAP/FSD\(2\)/1&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=E/ESCAP/FSD(2)/1&Lang=E).

\_\_\_\_\_ (2014c). *Economic and Social Survey of Asia and the Pacific 2014: Regional Connectivity for Shared Prosperity*. Sales No. E.14.II.F.4.

\_\_\_\_\_ (2014d). Fostering Sustainable Development in Asia and the Pacific. Note by the Secretariat for the Asia-Pacific Forum on Sustainable Development. Sales No. E/ESCAP/FSD/1.

\_\_\_\_\_ (2014e). *Statistical Yearbook for Asia and the Pacific 2014*. (ST/ESCAP/2704). Available from [www.unescap.org/resources/statistical-yearbook-asia-and-pacific-2014](http://www.unescap.org/resources/statistical-yearbook-asia-and-pacific-2014).

\_\_\_\_\_ (2014f). Sustainable Development Financing: Perspectives from Asia and the Pacific. Background paper prepared for the Asia-Pacific Outreach Meeting on Sustainable Development Financing, Jakarta, 10-11 June 2014.

\_\_\_\_\_ (2015a). *Economic and Social Survey of Asia and the Pacific 2015: Making Growth More Inclusive for Sustainable Development*. Sales No. E.15.II.F.7.

\_\_\_\_\_ (2015b). *Economic and Social Survey of Asia and the Pacific 2015 – Part II: Balancing the Three Dimensions of Sustainable Development: From Integration to Implementation*. Available from [www.unescap.org/sites/default/files/survey2015-pt2-cs71-theme-study.pdf](http://www.unescap.org/sites/default/files/survey2015-pt2-cs71-theme-study.pdf).

\_\_\_\_\_ (2015d). *Financing for Transformation: From Agenda to Action on Sustainable Development in Asia and the Pacific*. Sales No. E.15.II.F.6.

\_\_\_\_\_ (2015e). *Regional Trends Report on Energy for Sustainable Development in Asia and the Pacific 2015*. Bangkok. Available from [www.unescap.org/sites/default/files/Regional%20Trends%20Report%20on%20Energy%20for%20Sustainable%20Development%20in%20Asia%20and%20the%20Pacific%20%202015%20edition\\_1.pdf](http://www.unescap.org/sites/default/files/Regional%20Trends%20Report%20on%20Energy%20for%20Sustainable%20Development%20in%20Asia%20and%20the%20Pacific%20%202015%20edition_1.pdf).

\_\_\_\_\_ (2015f). Report of the seventy-first session of the Commission. E/ESCAP/71/43 (10 June). Available from [www.unescap.org/sites/default/files/pre-ods/E71\\_43E.pdf](http://www.unescap.org/sites/default/files/pre-ods/E71_43E.pdf).

\_\_\_\_\_ (2015g). *Valuing Waste, Transforming Cities*. Bangkok. Available from [www.unescap.org/sites/default/files/Full%20Report%20%20.pdf](http://www.unescap.org/sites/default/files/Full%20Report%20%20.pdf).

\_\_\_\_\_ (2016). *Statistical Yearbook for Asia and the Pacific 2015*. Bangkok. Available from [www.unescap.org/stat/data/](http://www.unescap.org/stat/data/).

United Nations Environment Programme (n.d.). Eco-labelling. Available from [www.unep.org/resourceefficiency/Consumption/StandardsandLabels/Eco-labelling/tabid/101342/Default.aspx](http://www.unep.org/resourceefficiency/Consumption/StandardsandLabels/Eco-labelling/tabid/101342/Default.aspx).

\_\_\_\_\_ (UNEP) (2011). *Keeping Track of Our Changing Environment: From Rio to Rio+20 (1992-2012)*. Nairobi. Available from [www.unep.org/geo/pdfs/keeping\\_track.pdf](http://www.unep.org/geo/pdfs/keeping_track.pdf).

\_\_\_\_\_ (2012). Poverty reduction. *Green Economy Briefing Papers*. Geneva. Available from [www.unep.org/greeneconomy/Portals/88/POVERTY\\_REDUCTION.pdf](http://www.unep.org/greeneconomy/Portals/88/POVERTY_REDUCTION.pdf).



- \_\_\_\_\_ (2013). *Recent Trends in Material Flows and Resource Efficiency in Asia and the Pacific*. Bangkok. Available from [www.unep.org/pdf/RecentTrendsAP\(FinalFeb2013\).pdf](http://www.unep.org/pdf/RecentTrendsAP(FinalFeb2013).pdf).
- \_\_\_\_\_ (2015a). *Resource Use in the Asia-Pacific: A Booklet of Infographics*. Bangkok. Available from [http://greeninfo.asia/Publications/Infographic\(Low-resolution\).pdf](http://greeninfo.asia/Publications/Infographic(Low-resolution).pdf).
- United Nations Environment Programme and Convention on Biological Diversity (2015). *State of Biodiversity Asia and the Pacific*. Nairobi.
- United Nations Environment Programme Inquiry (2015a). *Aligning the Financial Systems in the Asia Pacific Region to Sustainable Development* (Jakarta: UNEP Inquiry). Available from [www.switch-asia.eu/fileadmin/user\\_upload/Publications/2015/Unep-Inquiry\\_Asia\\_Finance\\_Final.pdf](http://www.switch-asia.eu/fileadmin/user_upload/Publications/2015/Unep-Inquiry_Asia_Finance_Final.pdf).
- United Nations Environment Programme Inquiry, California Public Employees' Retirement System, and Rob Lake Advisors Ltd. (2015b). Financial reform, institutional investors and sustainable development: A review of current policy initiatives and proposals for further progress. *Inquiry Working Paper* 15/07. Geneva, UNEP Inquiry. Available from [http://apps.unep.org/publications/pmtdocuments/-Financial\\_Reform,\\_Institutional\\_Investors\\_and\\_Sustainable\\_Development\\_\\_\\_A\\_Review\\_of\\_Current\\_Policy\\_Initiatives\\_and\\_Proposals\\_for\\_Further\\_Progress-201.pdf](http://apps.unep.org/publications/pmtdocuments/-Financial_Reform,_Institutional_Investors_and_Sustainable_Development___A_Review_of_Current_Policy_Initiatives_and_Proposals_for_Further_Progress-201.pdf).
- United Nations Environment Programme and People's Bank of China (2015). *Establishing China's Green Financial System: Report of Green Finance Task Force*. Bangkok. Available from [www.cbd.int/financial/privatesector/china-Green%20Task%20Force%20Report.pdf](http://www.cbd.int/financial/privatesector/china-Green%20Task%20Force%20Report.pdf).
- United Nations-Habitat and Economic and Social Commission for Asia and the Pacific (2015). *The State of Asian and Pacific Cities 2015*. Bangkok. Available from [www.unescap.org/resources/state-asian-and-pacific-cities-2015-urban-transformations-shifting-quantity-quality](http://www.unescap.org/resources/state-asian-and-pacific-cities-2015-urban-transformations-shifting-quantity-quality).
- United Nations Industrial Development Organization and Agence Francaise de Developpement (2013). *Green Growth: From Labour to resource productivity, Best Practice Examples, Initiatives and Policy Options*. Paris. Available from [www.greengrowthknowledge.org/resource/green-growth-labour-resource-productivity-best-practice-examples-initiatives-and-policy](http://www.greengrowthknowledge.org/resource/green-growth-labour-resource-productivity-best-practice-examples-initiatives-and-policy).
- United Nations Office of Legal Affairs (2014). 'The role of UNCLOS in sustainable development.' Introductory remarks. OLA/DOALOS Side event. Available from [http://legal.un.org/ola/media/info\\_from\\_lc/mss/speeches/MSS\\_DOALOS\\_Side\\_event-3-Feb-2014.pdf](http://legal.un.org/ola/media/info_from_lc/mss/speeches/MSS_DOALOS_Side_event-3-Feb-2014.pdf).
- United Nation System Task Team (2012). Addressing Inequalities: The heart of the post-2015 agenda and the future we want for all.' Thematic Think Piece. Available from [www.un.org/millenniumgoals/pdf/Think%20Pieces/10\\_inequalities.pdf](http://www.un.org/millenniumgoals/pdf/Think%20Pieces/10_inequalities.pdf).
- Urbina, I. (2015). Sea slaves: The human misery that feeds pets and livestock. *New York Times*, 27 July. Available from [www.nytimes.com/2015/07/27/world/outlaw-ocean-thailand-fishing-sea-slaves-pets.html?\\_r=1](http://www.nytimes.com/2015/07/27/world/outlaw-ocean-thailand-fishing-sea-slaves-pets.html?_r=1).
- Vandemoortele, J. (2011). The MDG story: Intention denied. *Development and Change*, vol. 42, No. 1, pp. 1–21. Available from <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-7660.2010.01678.x/epdf>.
- Volz, U. (2015). The financial sector needs to be driving the green transformation. *Asia Pathways* (3 February). Available from [www.asiapathways-adbi.org/2015/02/the-financial-sector-needs-to-be-driving-the-green-transformation/#sthash.XSH5s6ys.9lbh184N.dpuf](http://www.asiapathways-adbi.org/2015/02/the-financial-sector-needs-to-be-driving-the-green-transformation/#sthash.XSH5s6ys.9lbh184N.dpuf).
- von Weizsacker, E., and others (2009). *Factor Five: Transforming the Global Economy Through 80 Per Cent Improvements in Resource Productivity*. A Report to the Club of Rome. New York: Routledge.
- von Weizsäcker, E.U., and others (2014). Decoupling 2: Technologies, Opportunities and Policy Options. A Report of the Working Group on Decoupling to the International Resource Panel. Nairobi: United Nations Environment Programme. Available from [www.unep.org/resourcepanel/Portals/24102/PDFs/IRP\\_DECOUPLING\\_2\\_REPORT.pdf](http://www.unep.org/resourcepanel/Portals/24102/PDFs/IRP_DECOUPLING_2_REPORT.pdf).
- Waughray, D., ed. (2011). *Water Security: The Water-Food-Energy-Climate Nexus*. Washington, D.C.: Island Press.
- Wells, T. (n.d.). Sen's capability approach. Erasmus University Rotterdam. Available from [www.iep.utwente.nl/sen-cap/](http://www.iep.utwente.nl/sen-cap/).
- White, I. and T. Falkland (2010). Management of freshwater lenses on small Pacific islands. *Hydrogeology Journal*, pp. 1–20.
- Whitley, S., and L. van der Burg (2015). Fossil fuel subsidy reform: From rhetoric to reality. Working Paper. The New Climate Economy: The Global Commission on the Economy and Climate. Available from [http://2015.newclimateeconomy.report/wp-content/uploads/2015/11/Fossil-fuel-subsidy-reform\\_from-rhetoric-to-reality.pdf](http://2015.newclimateeconomy.report/wp-content/uploads/2015/11/Fossil-fuel-subsidy-reform_from-rhetoric-to-reality.pdf).
- Whitmee, S. and others. (2015). Safeguarding human health in the Anthropocene epoch. Report of The Rockefeller Foundation–Lancet Commission on planetary health. *Lancet*, vol. 386, No. 10007, pp. 1973–2028.

World Bank (2010). *Economics of Adaptation to Climate Change*. Washington, D.C. Available from [http://siteresources.worldbank.org/EXTCC/Resources/EACC\\_FinalSynthesisReport0803\\_2010.pdf](http://siteresources.worldbank.org/EXTCC/Resources/EACC_FinalSynthesisReport0803_2010.pdf).

\_\_\_\_\_ (2013a). Fish to 2030: Prospects for Fisheries and Aquaculture. *World Bank Report* No. 83177-GLB (December). Washington, D.C. Available from [www.fao.org/docrep/019/i3640e/i3640e.pdf](http://www.fao.org/docrep/019/i3640e/i3640e.pdf).

\_\_\_\_\_ (2013b). Myanmar economic monitor. Washington, D.C. Available from [www.worldbank.org/content/dam/Worldbank/document/EAP/Myanmar/Myanmar\\_Economic\\_Monitor\\_October\\_2013.pdf](http://www.worldbank.org/content/dam/Worldbank/document/EAP/Myanmar/Myanmar_Economic_Monitor_October_2013.pdf).

\_\_\_\_\_ (2014). *State and Trends of Carbon Pricing*. Washington, D.C. Available from [www-wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2015/06/01/090224b0828bcd9e/1\\_0/Rendered/PDF/State0and0trends0of0carbon0pricing02014.pdf](http://www-wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2015/06/01/090224b0828bcd9e/1_0/Rendered/PDF/State0and0trends0of0carbon0pricing02014.pdf).

\_\_\_\_\_ (n.d.). G20 Financial inclusion indicators. Available from <http://databank.worldbank.org/data/reports.aspx?source=G20-Financial-Inclusion-Indicators> (accessed 7 October 2015).

World Bank and Ecofys (2015). *Carbon Pricing Watch 2015*. Washington, D.C. Available from [www-wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2015/08/26/090224b08309a09a/4\\_0/Rendered/PDF/Carbon0pricing0e0released0late02015.pdf](http://www-wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2015/08/26/090224b08309a09a/4_0/Rendered/PDF/Carbon0pricing0e0released0late02015.pdf).

World Health Organization (2015). *Key facts from JMP 2015 report*. Available from [www.who.int/water\\_sanitation\\_health/publications/JMP-2015-keyfacts-en-rev.pdf?ua=1](http://www.who.int/water_sanitation_health/publications/JMP-2015-keyfacts-en-rev.pdf?ua=1).

World Water Assessment Programme (WWAP) (2012). *The United Nations World Water Development Report 4: Managing Water under Uncertainty and Risk*. Paris, United Nations Educational, Scientific and Cultural Organization.

World Water Council (WWC). (2000). *A Water Secure World: Vision for Water, Life, and the Environment*. Paris: World Commission for Water in the 21st Century.

World Wildlife Fund and World Resources Institute (2013). *Meeting Renewable Energy Targets: Global Lessons from the Road to Implementation*. Geneva. Available from [http://awsassets.panda.org/downloads/meeting\\_renewable\\_energy\\_targets\\_\\_low\\_res\\_.pdf](http://awsassets.panda.org/downloads/meeting_renewable_energy_targets__low_res_.pdf).

Yuqing Y., and others (2015). Ex-post assessment of China's industrial energy efficiency policies during the 11th Five-Year Plan. *Energy Policy*, vol. 76, pp. 132–145.

Zhixiao, M., and others (2013). Co-benefits analysis on climate change and environmental effects of wind-power: A case study from Xinjiang, China. *Renewable Energy*, vol. 57, 2013, pp. 35–42.

Zusman, E., M. Bengtsson, and S.H. Olsen, eds. (2015). *Achieving the Sustainable Development Goals: From Agenda to Action*. Hayama, Japan: Institute for Global Environmental Strategies. Available from <http://pub.iges.or.jp/modules/envirolib/view.php?docid=6063>.

Zusman, E., and others (2014). Governing sustainability transitions in Asia: Cases from Japan, Indonesia and Thailand. *ECO: The Korean Journal of Environmental Sociology*, vol.18. Available from <http://pub.iges.or.jp/modules/envirolib/view.php?docid=5585>.



## STATISTICAL ANNEX

### INTRODUCTION

This statistical annex complements the report *Transformations for Sustainable Development: Promoting Environmental Sustainability in Asia and the Pacific*. It provides snapshots of select indicators for three of the four areas of transformation argued for in this report—resource use, social justice and economic structure.

Using 1990 as the baseline and to the extent that data are available, the long-term trends for all countries in the region covered by ESCAP are illustrated. They indicate that 20 years after the first United Nations Conference on Sustainable Development (also known as the Earth Summit), the region's record in advancing environmental protection as one of the dimensions of sustainable development is mixed. While improvements are evident in some areas, such as in greenhouse gas intensity, energy efficiency and consumption of ozone-depleting substances, progress has been limited in such fundamental issues as preventing further deforestation and loss of biodiversity. Despite an overall increase in the region's material consumption, many countries have not been able to meet the basic human needs of all of their people in areas such as water, sanitation and energy.

The availability of disaggregated data on access to basic services and resources across sex, income and other groups is generally poor. This is a critical gap, considering that transformations are political and are likely to affect various groups differently. It is anticipated that this will be addressed in the context of defining national indicators and targets for the SDGs. Extra efforts to track investment flows are needed to also support policymaking and SDG-related investments.

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## SECTION A. ENVIRONMENTAL LIMITS

Rockström and others (2009) analysed the anthropogenic pressures on the Earth's system and identified seven planetary boundaries—climate change, ocean acidification, stratospheric ozone, biogeochemical nitrogen, global freshwater use, land system change and the rate of biodiversity loss. A 2015 update of the study concludes that humanity has already transgressed four planetary boundaries—climate change, loss of biosphere integrity, land system change and altered biogeochemical cycles (phosphorus and nitrogen).<sup>1</sup>

Each country should take specific steps to assess its contributions to the environmental pressures, to define those environmental limits that are important to its own development context, and to reflect those limits in policy. For instance, a mountainous country that is vulnerable to natural disasters, Bhutan has established minimum forest cover targets in its constitution.

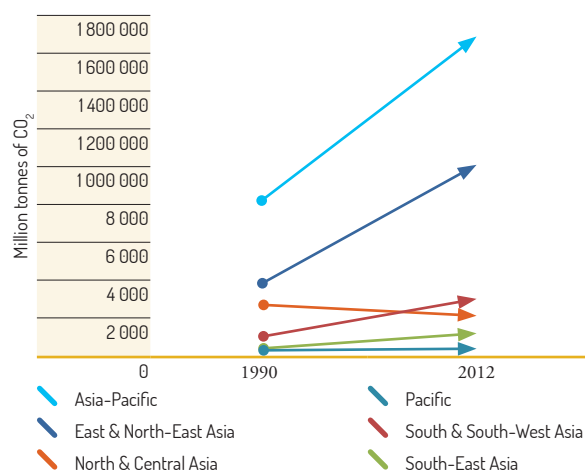
### CLIMATE CHANGE: AGGREGATE CO<sub>2</sub> EMISSIONS ARE INCREASING

Total CO<sub>2</sub> emissions from fuel combustion constitutes the majority of greenhouse gas emissions from the Asia-Pacific region. Regional emission levels increased from 8,027 million tonnes of CO<sub>2</sub> in 1990 to 16,849 million tonnes in 2012, with East and North-East Asian economies driving this trend (Figure A1).

### OZONE DEPLETION: CONSUMPTION OF OZONE-DEPLETING PRODUCTS IS DECLINING

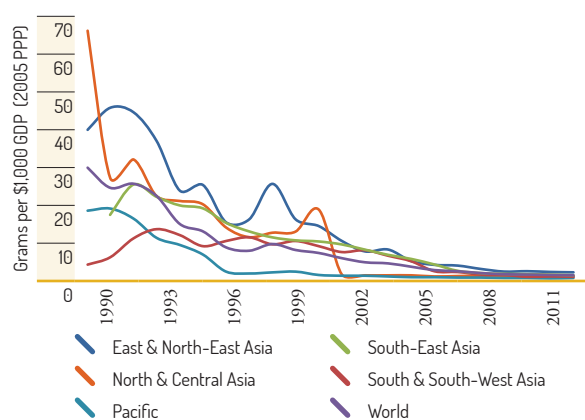
Action under the Montreal Protocol on Substances that Deplete the Ozone Layer was successful in reversing the thinning of the ozone layer in the 1990s.<sup>2</sup> In 1990, consumption of ozone-depleting substances was highest in North and Central Asia at 66 grams per \$1,000 GDP (2005 PPP); followed by East and North-East Asia at 40 grams—significantly higher than the world average. By 2011, all subregions had reduced their consumption of all ozone-depleting substances to less than 1 gram (Figure A2).

Figure A1 Total CO<sub>2</sub> emissions from fuel combustion in Asia and the Pacific, 1990 and 2012



Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, CO<sub>2</sub> emissions from fuel combustion statistics.

Figure A2 Consumption of ozone-depleting substances, Asia-Pacific subregions, 1990–2011

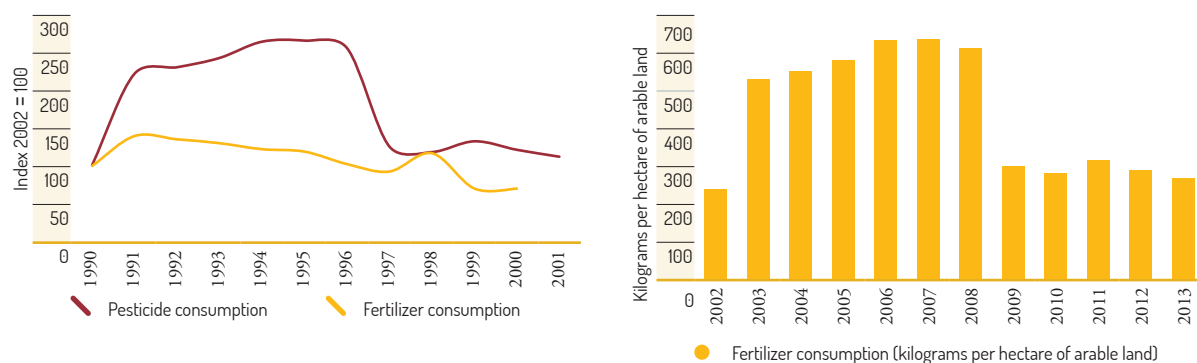


Source: ESCAP statistical database, based on data from MDG Indicators (accessed 15 Dec. 2015).

### BIOCHEMICAL FLOWS: CONSUMPTION PATTERN OF CHEMICALS IS INCREASING INTERFERENCE WITH THE GLOBAL NITROGEN CYCLE

The current annual consumption of fertilizers and pesticide has declined from the highs of the previous decades. According to FAO (2014a), this decline could

Figure A3 Changes in consumption of fertilizers and pesticides, Asia-Pacific region, 1990–2013



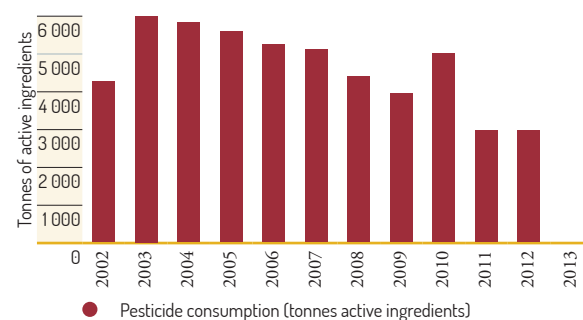
be due to more environmental awareness and regulation as well as large fertilizer price spikes during 2007–2009.<sup>3</sup>

### FRESHWATER RESOURCES: FRESHWATER PER CAPITA WITHDRAWAL IS DECREASING, BUT WATER STRESS LEVELS IN NINE COUNTRIES IN THE REGION REMAIN HIGH

Rapid growth rates of population and urbanization intensify pressure on water resources. Although water consumption of the industrial sector has become more significant—particularly in the region’s emerging economies—agriculture uses most of the surface water available.<sup>4</sup>

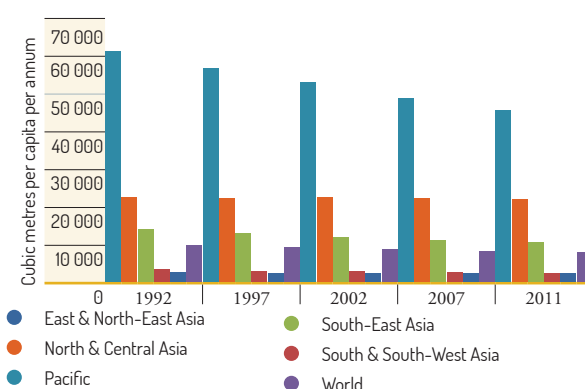
Figure A4 shows decreases in freshwater withdrawal per capita in ESCAP subregions during 1992–2011. Per capita withdrawals have been highest in the Pacific, followed by North and Central Asia and South-East Asia. In North and Central Asia and South-East Asia, per capita withdrawals exceed the global figure.

High levels of withdrawal per capita can be attributed to a country’s economic structure and irrigation practices. The



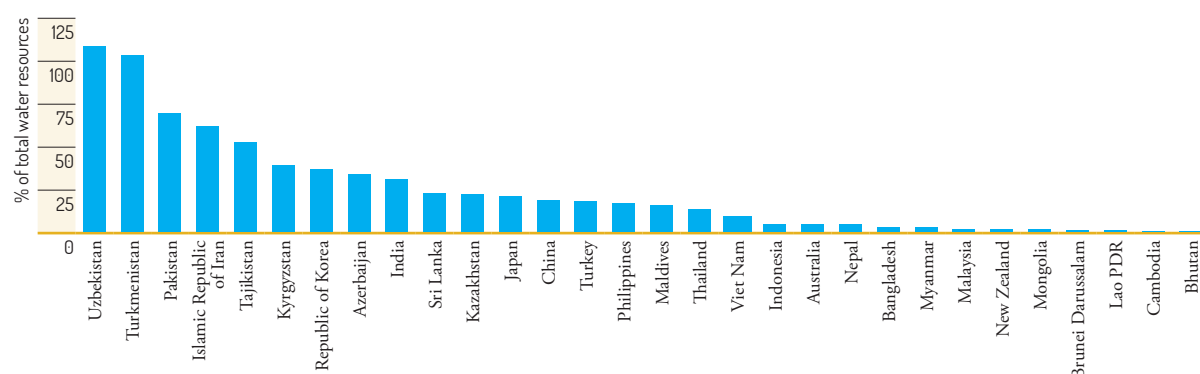
Source: FAO, 2015a.

Figure A4 Freshwater withdrawal per capita, 1992–2011



Source: ESCAP statistical database, based on data from AQUASTAT, FAO (accessed 15 Dec. 2015).

Figure A5 Total freshwater withdrawal as share of total renewable water per annum, 1990–2010 average



Source: United Nations Statistics Division, 2015

proportion of total water resources used differs widely between countries as shown in Figure A5.

According to Gassert and others (2013), nine of the 36 countries in the world that are facing *extremely high levels* of water stress are in the Asia-Pacific region (Table A1): Singapore (1st), Kyrgyzstan (22nd), Islamic Republic

of Iran (24th), Uzbekistan (30th), Pakistan (31st), Turkmenistan (32nd), Mongolia (33rd), Kazakhstan (35th) and Afghanistan (36th).<sup>5</sup>

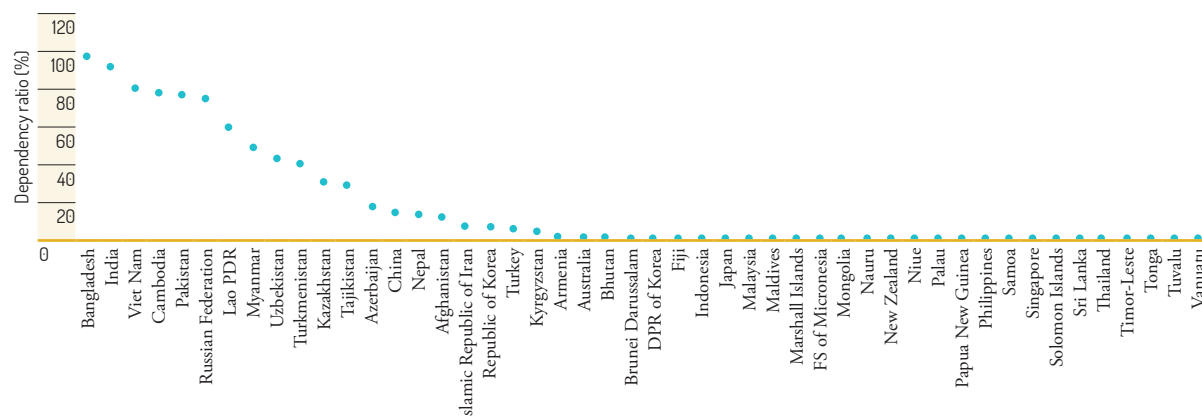
Figure A6 shows the dependence of countries of the region on water originating from outside of their borders, as indicated by the water dependency ratio.

Table A1 Baseline water stress, by country and sector

Global rank	Country	All sectors	Agricultural	Domestic	Industrial
Score: 1 = Low stress, 5 = Extremely high stress					
1	Singapore	5.00	-	5.00	5.00
22	Kyrgyzstan	4.82	4.82	4.91	4.89
24	Islamic Republic of Iran	4.78	4.79	4.76	4.61
30	Uzbekistan	4.32	4.29	4.53	4.53
31	Pakistan	4.31	4.33	4.14	4.12
32	Turkmenistan	4.30	4.30	4.13	4.35
33	Mongolia	4.05	3.23	4.17	4.82
35	Kazakhstan	4.02	4.07	3.79	3.80
36	Afghanistan	4.01	4.01	3.64	3.89
40	India	3.58	3.63	3.08	3.44
41	Republic of Korea	3.54	3.44	3.52	3.85
42	Tajikistan	3.53	3.55	3.44	3.22
44	Australia	3.51	3.50	3.66	3.45
50	Azerbaijan	3.39	3.23	3.50	3.79
54	Philippines	3.33	3.35	3.31	3.24
57	Indonesia	3.26	3.44	2.98	2.64
63	Armenia	3.07	3.07	3.05	3.21
64	Japan	3.05	3.07	3.05	3.21
66	Turkey	3.02	3.00	3.09	3.02
68	Sri Lanka	3.01	3.10	2.28	2.65
69	China	2.94	3.01	2.61	2.94
78	Nepal	2.40	2.40	2.49	2.55
82	Malaysia	2.09	1.93	2.14	2.20
83	Democratic People's Republic of Korea	2.06	2.07	1.86	2.19
92	Thailand	1.70	1.73	1.40	1.49
95	Georgia	1.51	1.62	1.32	1.46
100	New Zealand	1.35	1.05	1.98	1.35
108	Russian Federation	1.23	1.58	1.41	1.10
115	Viet Nam	1.01	0.98	1.12	1.41
125	Bangladesh	0.65	0.64	0.69	0.82
129	Papua New Guinea	0.60	-	0.61	0.58
138	Bhutan	0.45	0.47	0.41	0.54
139	Cambodia	0.44	0.45	0.38	0.19
148	Myanmar	0.30	0.27	0.39	0.62
170	Lao People's Democratic Republic	0.01	0.01	0.02	0.01
172	Brunei Darussalam	0.01	0.07	0.07	0.02

Source: Gassert and others, 2013.

Figure A6 Water dependency ratio, 2008–2012



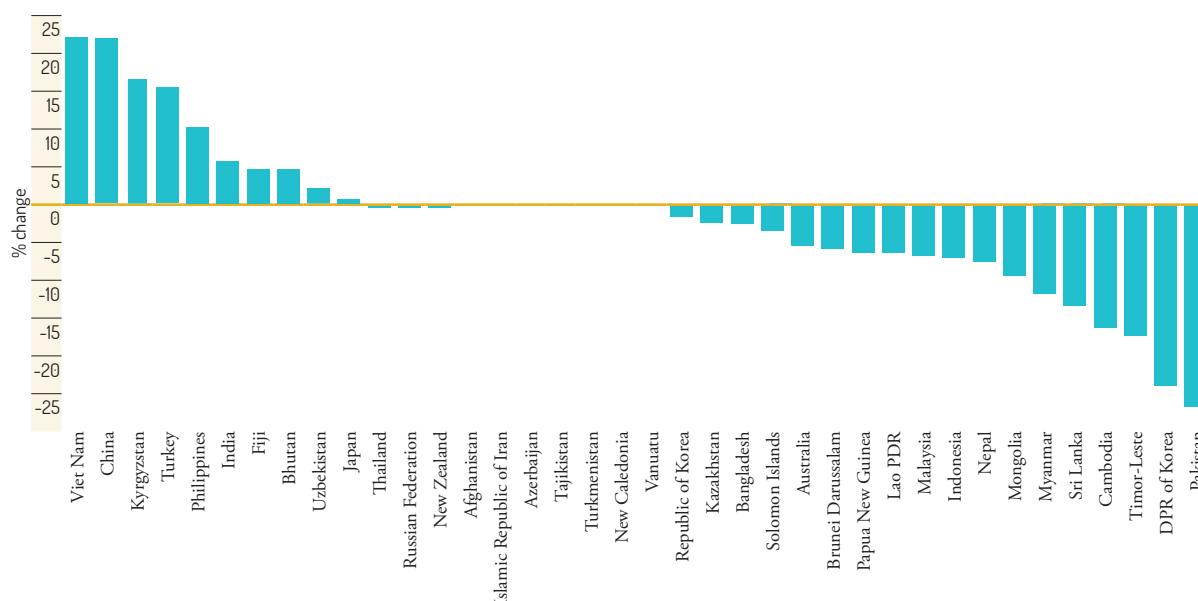
Source: FAO, 2015b.

Of these highly stressed countries, five obtain more than 20 per cent of water from sources originating outside of their countries—Kazakhstan, Pakistan, Tajikistan, Turkmenistan and Uzbekistan (Figure A6). Extremely high levels of baseline water stress do not necessarily lead to water scarcity if proper management and conservation strategies are implemented.

### LAND USE: LAND USE CHANGE IN THE REGION IS ACCELERATING BIODIVERSITY LOSS IN DEVELOPING COUNTRIES

The world may not be able to sustain the current rate of loss of species without resulting in functional collapses.<sup>6</sup> Human activities are accelerating the decline of biological diversity at rates of 100 to 1,000 times pre-human levels.<sup>7</sup> With growing global demand for consumer products

Figure A7 Percentage change in forest cover, 2000–2012



Source: ESCAP statistical database, based on FAOSTAT and Global Forest Resource Assessment 2010.

that depend on inputs of agro-industry, such as coffee and timber, the region is experiencing land use change, including deforestation.

Figure A7 shows significant decline in forest cover between 2000 and 2012 in a number of countries across the region, notably Democratic People's Republic of Korea and Pakistan. This and other habitat loss, together with the impacts of hunting, are driving the increase in extinction risk. In 2012, IUCN listed more than 6,600 species within the region. About 27 species have since become extinct, nearly 120 species are critically endangered and nearly 1,000 species are vulnerable or nearly threatened.

According to the IUCN's Red List, six countries in the region were among the world's top-20 countries with the largest number of threatened mammal species. Table A2 shows the estimated total number of threatened mammal species in the six countries.

Table A2 Threatened mammal species, 2014

Country	Total threatened mammal species
Indonesia	186
India	96
China	74
Malaysia	71
Thailand	57
Australia	56

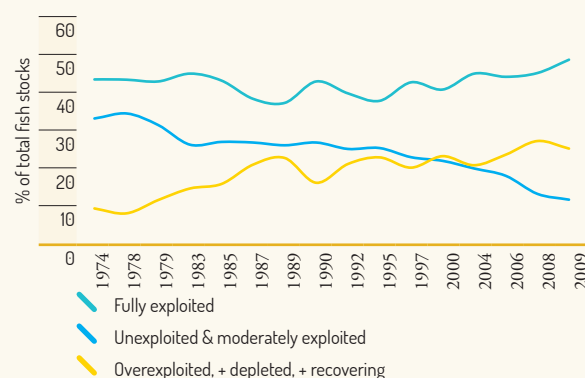
South-East Asia is a biodiversity hotspot encompassing about 20 per cent of the global plant, animal and marine species. The region contains three megadiverse countries, including Indonesia, Malaysia and the Philippines—where four of the world's 25 biodiversity hotspots are located. Climate change impacts and human pressures threaten these species. Although the rate of extinction is relatively small, deforestation and fragmentation of habitats is accelerating biodiversity loss.<sup>8</sup> 🌿

### Fish stock decline

International markets exert huge pressure on fishery resources impacting local food security. Figure A8 indicates that exploitation of fish stocks is accelerating.

According to FAO (2014b), nearly 90 per cent of all people globally involved in fisheries and aquaculture live in Asia. Two-thirds of the world's inland catch in 2008 was in Asia, with steady increases since the 1950s. While global fisheries are overexploited, the impacts of climate change (ocean acidification, coral bleaching) further increase the pressures on fish stocks.

Figure A8 Global fish stock exploitation, 1974–2009



Source: FAO, 2014b.

## SECTION B. RESOURCE USE

Understanding the rate of resource use is crucial for ensuring the sustainability of the consumption and production patterns.

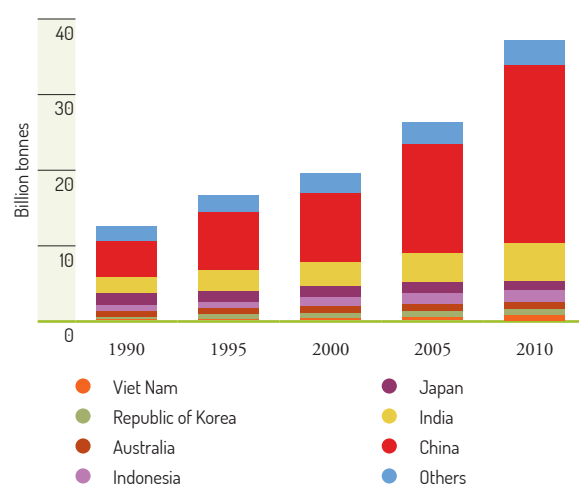
### MATERIAL CONSUMPTION IN THE ASIA-PACIFIC REGION<sup>9</sup> HAS INCREASED SIGNIFICANTLY<sup>10</sup>

Between 1990 and 2010, the use of biomass, fossil fuels, metal ores and non-metallic minerals increased by threefold, from 12.4 billion to 37.1 billion tonnes, which represents an average growth of 5.6 per cent annually, more than four times the population growth rate and 0.9 percentage points higher than GDP growth.



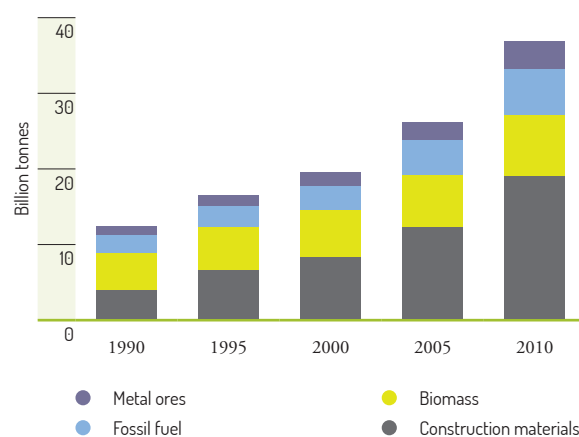
With global material consumption at 70 billion tonnes in 2010, the Asia-Pacific region consumes more than half of the world's materials. China, together with Australia, India, Indonesia, Japan, the Republic of Korea and Viet Nam, dominated domestic material consumption at the regional and global levels in 2010 (Figure B1). Developing countries' material consumption grew at an average annual rate of 6.3 per cent between 1990 and 2010.

Figure B1 Domestic material consumption, Asia-Pacific region, 1990–2010



Source: UNEP Live.

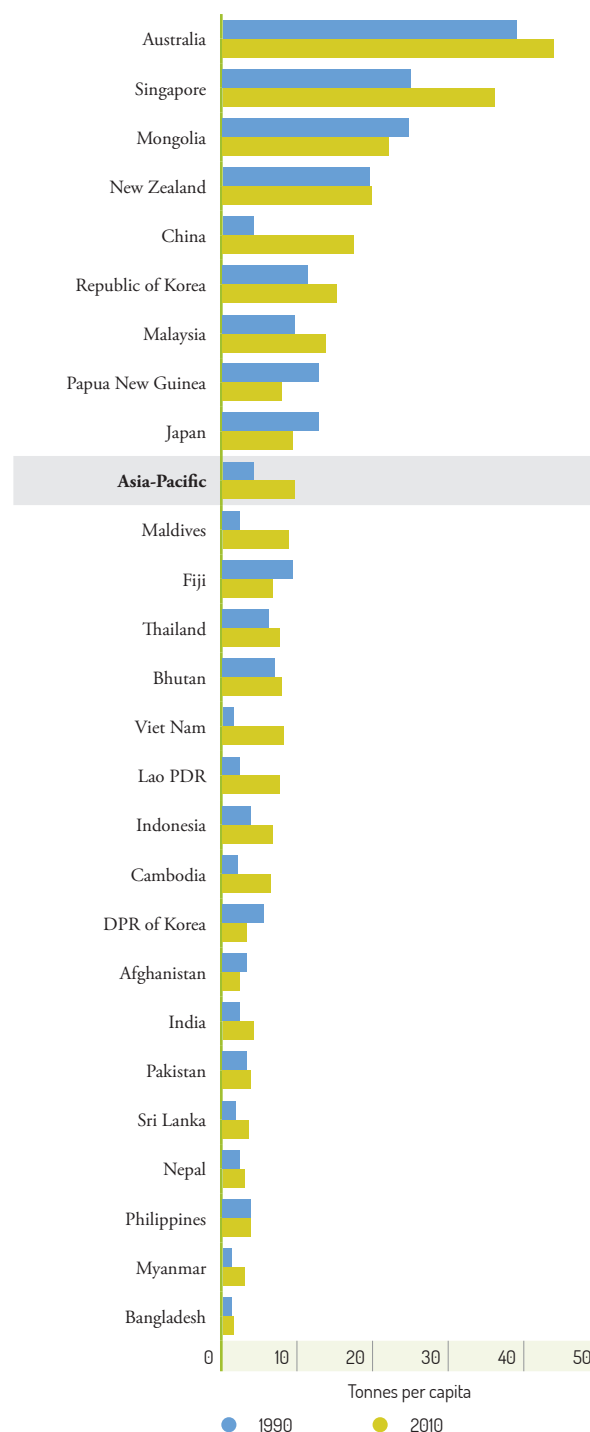
Figure B2 Domestic material consumption, by material, Asia-Pacific region, 1990–2010



Source: UNEP Live.

The use of all materials has increased, but in the past four decades, the region transitioned from biomass-based to mineral-based economies. Non-metallic minerals composed mostly of construction aggregates have experienced massive increase in utilization rates, by 4.8

Figure B3 Domestic material consumption per capita, Asia-Pacific region, 1990 and 2010



Source: UNEP Live.

times. In the same period, consumption of fossil fuels and metal ores increased by 2.6 and 3 times, respectively (Figure B2).

While the rest of the region has shown significant increase in per capita domestic material consumption, the Democratic People's Republic of Korea, Fiji and Papua New Guinea experienced a decline for the 1990 to 2010 period (Figure B3). In Fiji, biomass and metal ore per capita consumption declined by 49 per cent and 33 per cent, respectively.

### MATERIAL USE IS GROWING FASTER THAN GDP<sup>11</sup>

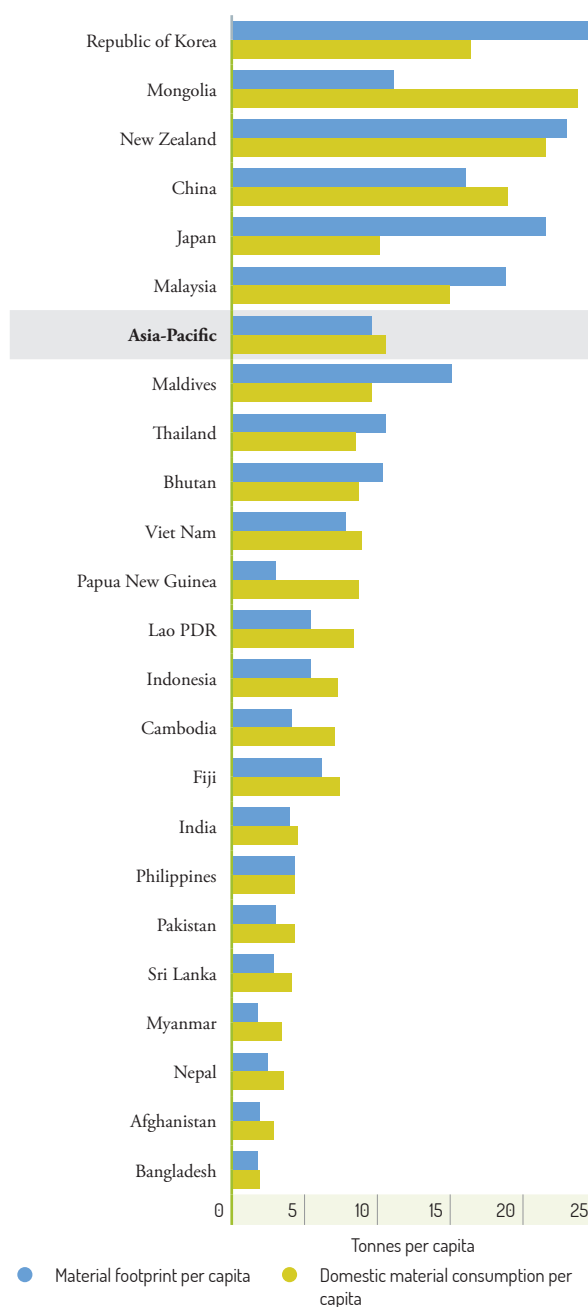
The material footprint of consumption indicates the total consumption of resources by a country.

Since 1990, the Asia-Pacific region has increased its material footprint of consumption, on average, by 5.5 per cent annually. The majority of the expansion in the material footprint has originated from the growing final consumption and capital investment in the region's cluster of developing countries. The developing group continues to lead the region in increasing average per capita footprint of consumption, at 5.1 per cent annually.

In 2010, the highest material footprint recorded was for Singapore, at 70.5 tonnes per capita. Less populated countries, such as Bhutan and Fiji, also had high per capita materials use, at 9.6 and 5.7 tonnes per capita, respectively. In the developed group, Australia had the highest per capita material use, at 37.8 tonnes (Figure B4).

Material footprint per capita by sector in the Asia-Pacific region has increased considerably in the past two decades. The largest increase was in the construction sector, where the material footprint per capita tripled, from 1,000 tonnes per capita in 1990 to 3,000 tonnes in 2010. In 2010, construction and manufacturing were the largest consumers of material, accounting for 34.2 per cent and 30.5 per cent, respectively, of the total material footprint in the region.

Figure B4 Material footprint and domestic material consumption per capita, Asia-Pacific region, 2010

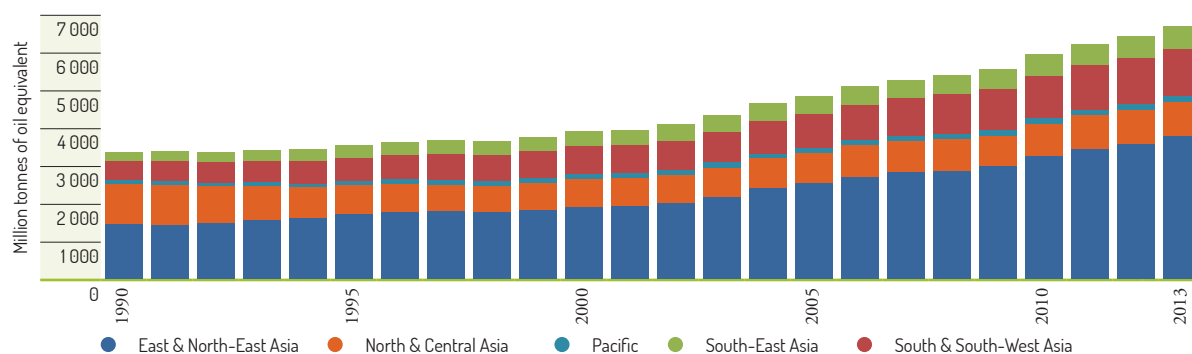


Source: UNEP Live.

### PRIMARY ENERGY SUPPLY IS INCREASING AND FOSSIL FUELS CONTINUE TO DOMINATE THE ENERGY MIX IN THE ASIA-PACIFIC REGION<sup>12</sup>

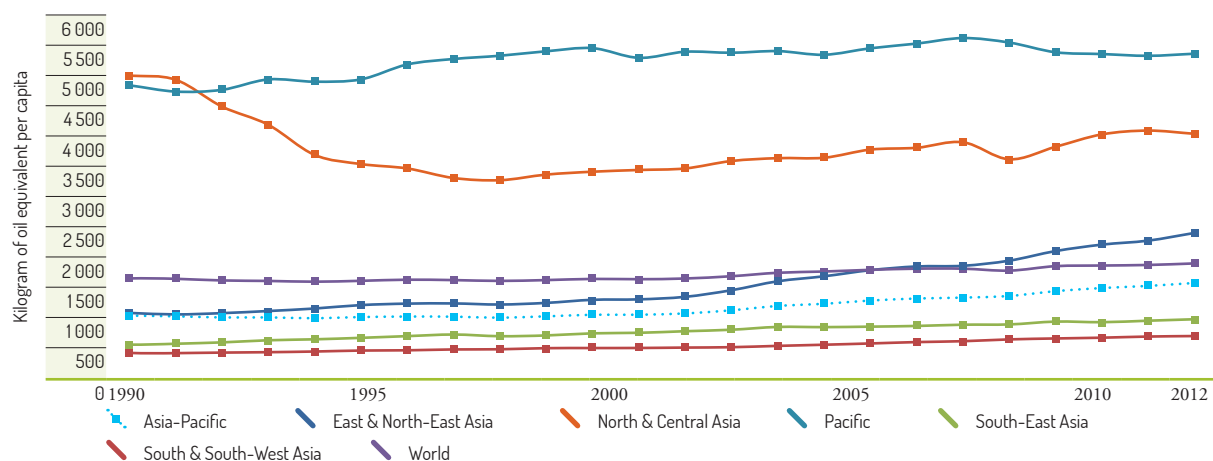
The total primary energy supply is largely associated with economic growth. The amount of energy used and the characteristics of energy sources determine the energy

Figure B5 Total primary energy supply, 1990–2013



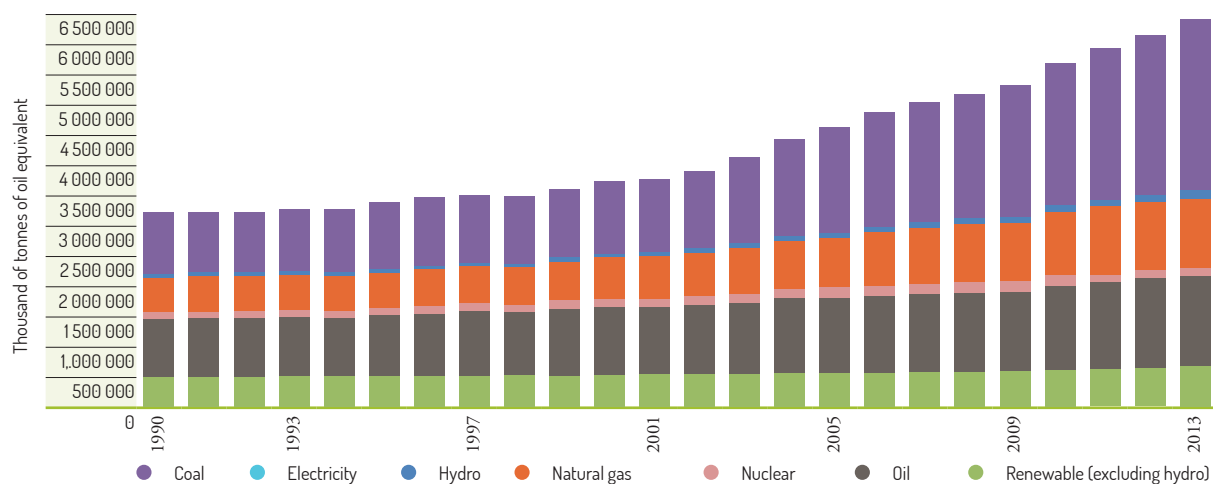
Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, World Energy Statistics and Balances.

Figure B6 Total primary energy supply per capita, 1990–2012



Source: ESCAP Asia Pacific Energy Portal, calculated based on data from the International Energy Agency and World Population Prospects.

Figure B7 Primary energy mix in the Asia-Pacific region, 1990–2013



Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, World Energy Statistics and Balances.

profiles of an economy. Regional trends show that total primary energy supply (TPES) growth between 1990 and 2013 was mainly driven by East and North-East Asia. In 1990, China's regional TPES share was 26 per cent, which increased to 44 per cent in 2012.

TPES per capita has increased between 1990 and 2012 in every subregion, with the exception of North and Central Asia.

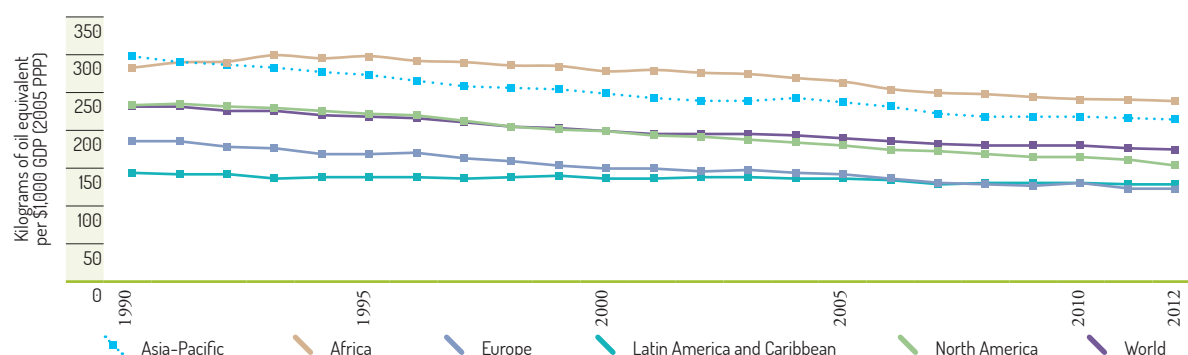
The region's reliance on fossil fuels is increasing. In 1990, coal comprised only 32.1 per cent of the primary energy mix in the region, but by 2012, its share had increased to 44 per cent. The share of oil, however, declined, from 30.4 per cent in 1990 to 23.9 per cent in 2012. These changes in the primary energy mix also influenced the

decline in the share of renewable energy, from 15 per cent in 1990 to 10.2 per cent in 2012 (Figure B7).

### ENERGY EFFICIENCY IS IMPROVING BUT MORE EFFORTS ARE REQUIRED TO CLOSE THE GAP WITH THE GLOBAL EFFICIENCY LEVEL<sup>13</sup>

Energy efficiency is assessed in terms of the overall energy intensity of an economy, as represented by the amount of energy that is used in an economy per unit of GDP. Lower energy intensity implies higher energy efficiency. Energy efficiency has been promoted regionally as part of the shift to a low-carbon development path. Between 1990 and 2012, the region reduced its energy intensity by 29 per cent, while there was a global reduction of 25 per cent (Figure B8).

Figure B8 Primary energy intensity, Asia-Pacific region and the rest of the world, 1990–2012



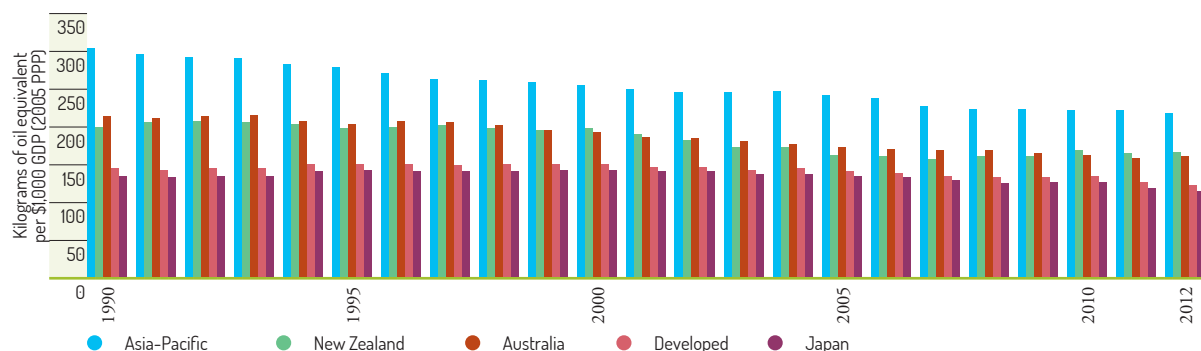
Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, World Energy Statistics and Balances and the United Nations Statistics Division National Accounts Main Aggregates Database.

Figure B9 Primary energy intensity, Asia-Pacific region, developed and developing economies, 1990–2012



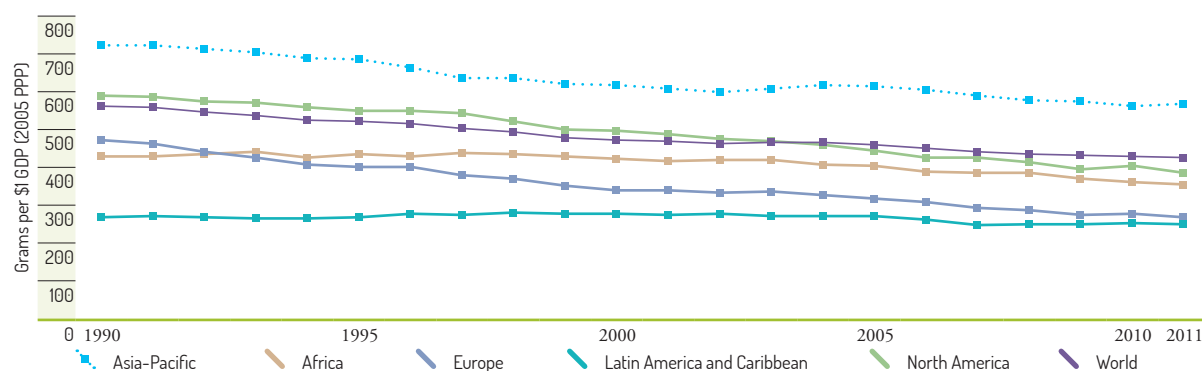
Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, World Energy Statistics and Balances and the United Nations Statistics Division National Accounts Main Aggregates Database.

Figure B10 Primary energy intensity of the economy, Asia-Pacific and developed economies, 1990–2012



Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, World Energy Statistics and Balances and the United Nations Statistics Division National Accounts Main Aggregates Database.

Figure B11 Carbon intensity of the economy, Asia-Pacific region and the rest of the world, 1990–2011



Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, CO<sub>2</sub> emissions from fuel combustion statistics and World Bank World Development Indicators.

The developing countries are driving the decrease in energy intensity across the region (Figure B9). In 2012, the energy intensity of developing countries in the region was 236 kg of oil equivalent per \$1,000 GDP (2005 PPP), a decrease from 385 kg in 1990 and representing an average annual decrease of nearly 1.8 per cent. The decrease was mainly due to energy efficiency improvements and changes in the economic structures of countries. The energy intensity in their industrialized counterparts, including Australia, Japan and New Zealand, decreased from 302 kg of oil equivalent per \$1,000 GDP (2005 PPP) in 1990 to 217 kg in 2012 (Figure B10), representing nearly a 1.3 per cent average annual rate of reduction.

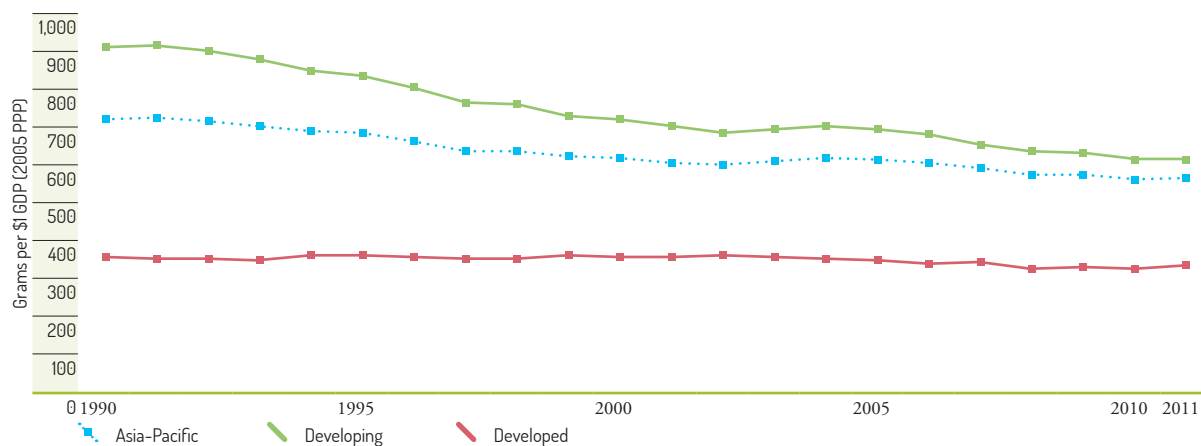
## DESPITE INCREASES IN AGGREGATE EMISSIONS, CARBON INTENSITY IS DECLINING<sup>14</sup>

In 2011, the carbon intensity in the Asia-Pacific region was highest among the world's regions. At the global level, carbon intensity is decreasing in all regions (Figure B11).

For the Asia-Pacific region, the rate of decline in carbon intensity among developing countries is faster than the rate for industrialized countries (Figure B12).✿

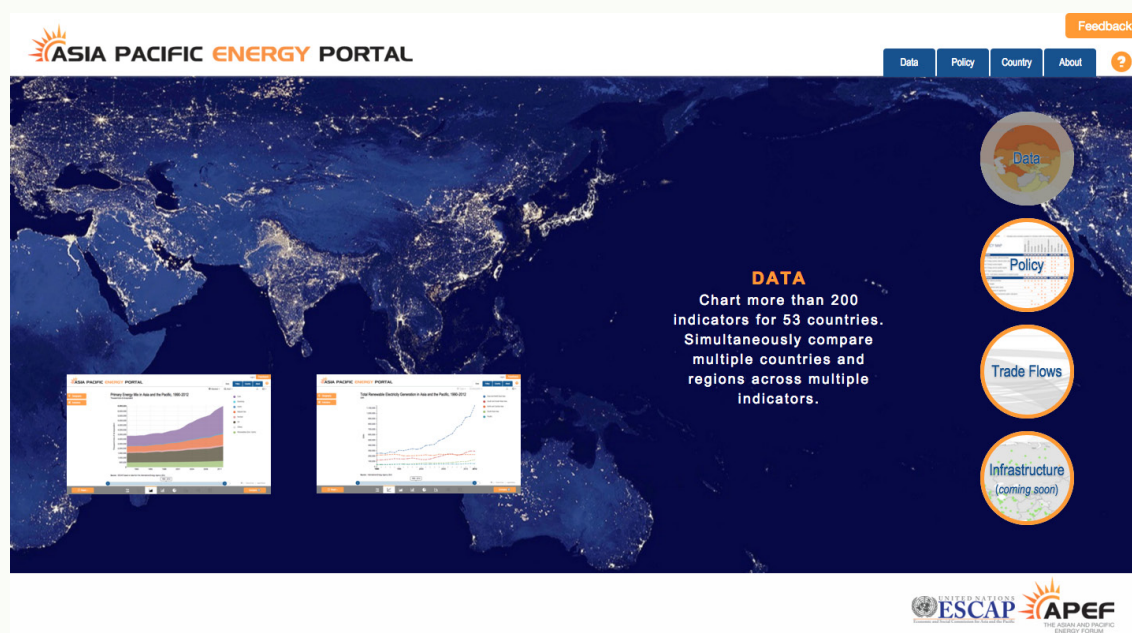


Figure B12 Carbon intensity of the economy, Asia-Pacific region, developed and developing countries, 1990–2011



Source: ESCAP Asia Pacific Energy Portal, based on data from the International Energy Agency, CO<sub>2</sub> emissions from fuel combustion statistics and World Bank World Development Indicators.

## WANT TO LEARN MORE ABOUT ENERGY PRODUCTION AND CONSUMPTION IN THE ASIA-PACIFIC REGION?



The Asia Pacific Energy Portal is an innovative energy information platform combining nearly 200 statistical indicators and more than 2,000 policy documents for 58 regional member States. As a single point of access for multi-source information, the portal offers users a comprehensive view of the region's energy dynamics. Interactive data visualizations and a cross-sectional policy matrix are unique features enabling rapid assessment and tracking of regional and national development. Energy trade flow diagrams simplify complex import and export data, and full-text policy searches facilitate in-depth research. These features are all found within a user-friendly interface that is accessible to a broad range of users, creating a tool for improved analysis of the energy situation, policies and their development impact.

## SECTION C. SOCIAL JUSTICE: MEETING BASIC NEEDS AND EQUITABLE ACCESS TO NATURAL RESOURCES

Although people's access to basic needs, such as water, food and energy, has improved over time in most of the region's countries, inequalities in access persist. The current state of water, food and energy access reflects both improvements and deficiencies.

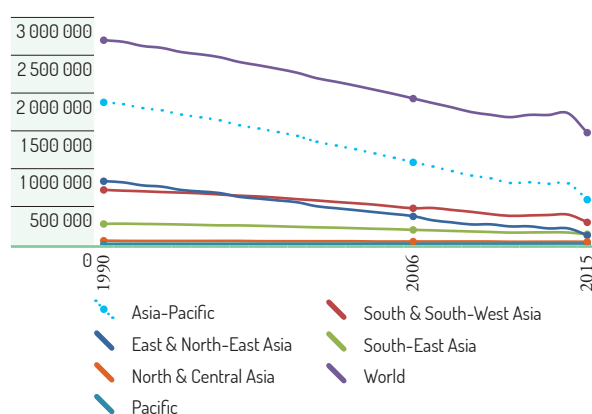
**AS MANY AS 277 MILLION PEOPLE HAVE NO ACCESS TO CLEAN DRINKING WATER, DESPITE SIGNIFICANT PROGRESS<sup>15</sup>**

The Asia-Pacific region achieved the MDG target of halving the proportion of people without access to safe drinking water well ahead of the 2015 deadline. With the starting point of 73 per cent in 1990, the region met the target in 2006, reaching 87 per cent, and progress continued to 94 per cent in 2015.

However, 277 million people in the region still lack access to clean drinking water, of which 138 million live in South and South-West Asia (Figure C1).

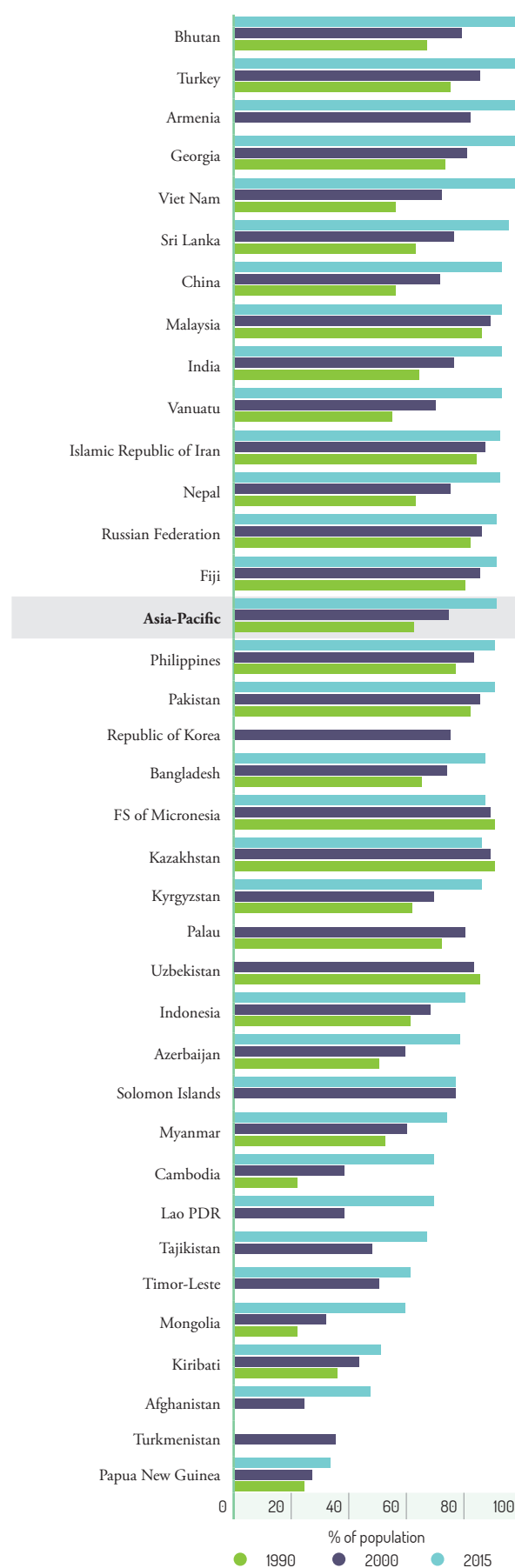
Of the 55 countries within the region with available data, eight had achieved universal access to clean drinking water in 1990 and six additional countries

Figure C1 People lacking access to improved water sources



Source: ESCAP, 2015a

Figure C2 Access to improved water sources in rural areas 1990, 2000 and 2015



Source: ESCAP, 2016

had achieved 100 per cent coverage by 2015. About two-thirds of countries met the MDG target while the remaining countries are close to or expected to meet the target. However, at least two recorded a decrease in overall access to improved water sources.<sup>16</sup>

### ONE IN TEN RURAL RESIDENTS STILL LACKS ACCESS TO CLEAN, POTABLE AND AFFORDABLE DRINKING WATER

The proportion of urban dwellers with access to improved water sources in the region is large, at 97 per cent. Yet, almost 10 per cent of the rural population in the region still does not have access to an improved water source. This represents 213 million people, or about three-fourths of the region's total population without access to clean drinking water.<sup>17</sup>

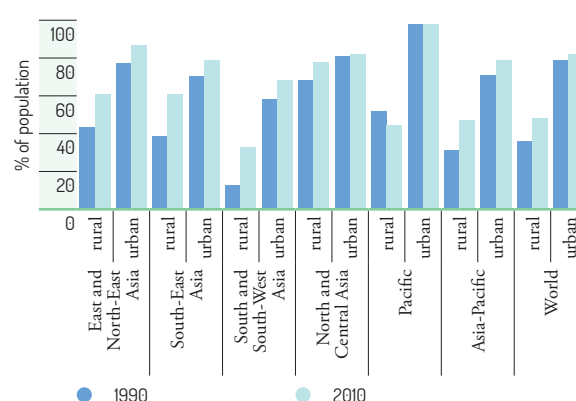
As of 2015, lack of access to safe water impacted more than one third of the rural population in several countries, including Papua New Guinea, Afghanistan, Kiribati, Mongolia, and Timor-Leste, among others (Figure C2).

### UNEQUAL ACCESS TO IMPROVED SANITATION BETWEEN URBAN AND RURAL AREAS CONTINUES TO BE A CHALLENGE IN REALIZING BASIC SANITATION FOR ALL IN THE ASIA-PACIFIC REGION

Of the 1.5 billion people in the Asia-Pacific region who did not have access to basic sanitation in 2015, 1.1 billion resided in rural areas—equivalent to around half of the region's total rural population.

Progress in basic sanitation in the rural areas has been substantially faster than that of the urban areas but it is not fast enough to close the urban-rural gap (Figure C3). Access to basic sanitation in rural areas in the region increased from 30 per cent in 1990 to 50 per cent in 2015, while it increased from 70 per cent to 81 per cent in the urban areas during the same period.

Figure C3 People lacking access to improved sanitation in urban and rural areas, 1990 and 2010

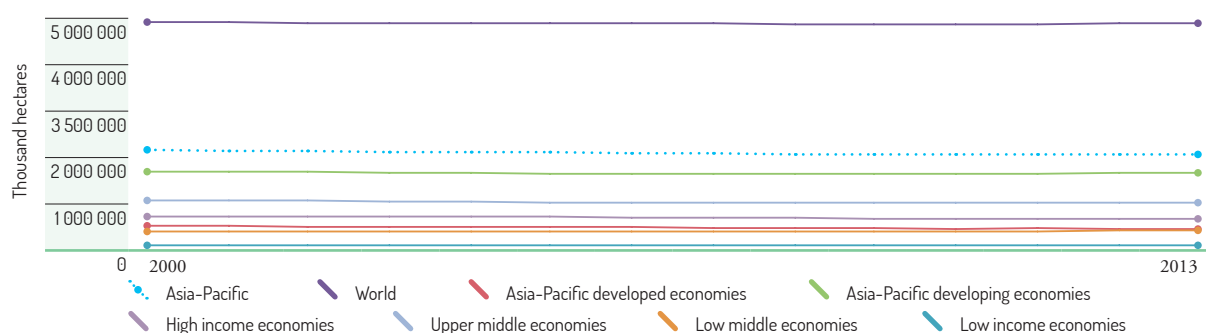


Source: ESCAP, 2016.

### AGRICULTURAL LAND AREA DECLINED BY 90 MILLION HA BETWEEN 2000 AND 2013<sup>18</sup>

Between 2000 and 2013, about 90 million ha of agricultural land were lost in the region (Figure C4). Most of the losses were in developed and developing economies with the exception of low income and lower middle income economies where land under agricultural production continued to expand.

Figure C4 Agricultural land, 2000-2013



Source: ESCAP, 2016.

Similar trends can be observed for arable land, which is the portion of agricultural land that can be ploughed and used to grow crops and which constitutes the most productive agricultural land. From 1993 to 2013, the Asia-Pacific region lost 5.3 per cent of its arable land due to land degradation and conversion to other uses, such as industrialization and urbanization.

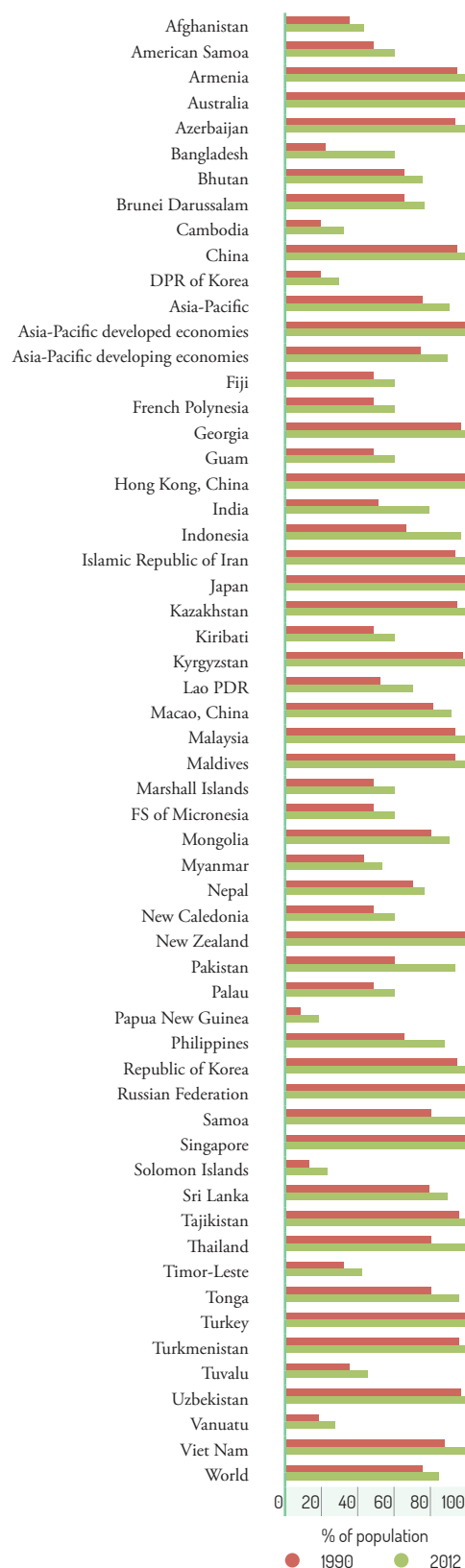
In 1961 globally, there was 0.45 ha of arable land available to feed one person. By 2012, that figure had more than halved, to 0.2 ha per capita. In the Asia-Pacific region, it was even lower, at 0.15 ha.

### AS MANY AS 3.5 BILLION PEOPLE IN THE ASIA-PACIFIC REGION HAVE ACCESS TO ELECTRICITY, BUT 455 MILLION REMAIN UNCONNECTED<sup>19</sup>

About 3.5 billion people in the region have access to electricity. In 2012, all countries in the region increased their electrification rates.<sup>20</sup> The proportion of the population with access to electricity has increased in all countries, with particularly large improvements in Bangladesh and Pakistan (Figure C5). However, an estimated 455 million people remain unconnected and in the dark. The rural areas account for the majority of this access deficit, highlighting the disparity between urban and rural electrification.

While the current estimates present an optimistic picture of access to electricity in the region, this must be interpreted with caution.<sup>21</sup> Individuals in households with electricity connections are counted, regardless of the source (grid or off-grid systems), quality, efficiency and availability of electricity supply. Also, comparisons with other reported estimates reveal discrepancies, which could be due to differences in definition, method of estimation, data sources and geographic coverage of different institutions. 🍀

Figure C5 Proportion of population with access to electricity, 1990 and 2012



Source: ESCAP Asia Pacific Energy Portal, based on data from SEA4ALL Global Tracking Framework.

## SECTION D. ECONOMIC STRUCTURE<sup>22</sup>

Structural transformation, which is the large-scale transfer of resources from the least productive economic activities of an economy to more productive ones, is an essential aspect of economic development.

### ECONOMIC STRUCTURAL TRANSFORMATION PROPELS A SHIFT OF EMPLOYMENT TO THE SERVICE SECTOR

Structural transformation involves a progressive shift of activity and labour within broad sectors, from agriculture to industry and services. This evolution can be observed in all subgroups of countries across the region. Thus, the share of agriculture in total employment in the region has declined, from 54 per cent in 1991 to 36 per cent in 2013, while the share of industry has increased, from 18 per cent to 23 per cent, and the share of services went from 28 per cent to 41 per cent (Figure D1).

The services sector is driving employment generation in the region (Figure D2). The industrial sector in most countries in the region has not generated enough employment to significantly impact unemployment. Manufacturing employment shares are also declining at an earlier stage in economic transition—at lower levels of per capita income than they once did.

### TRADE INTEGRATION AND AN INCREASE IN LABOUR PRODUCTIVITY HAVE NOT NECESSARILY TRANSLATED INTO UPGRADED PRODUCTION

The main driver of the structural transformation is the evolution of productivity. The region has experienced a dramatic increase in labour productivity over the past few decades, albeit mainly in the manufacturing and services sectors.

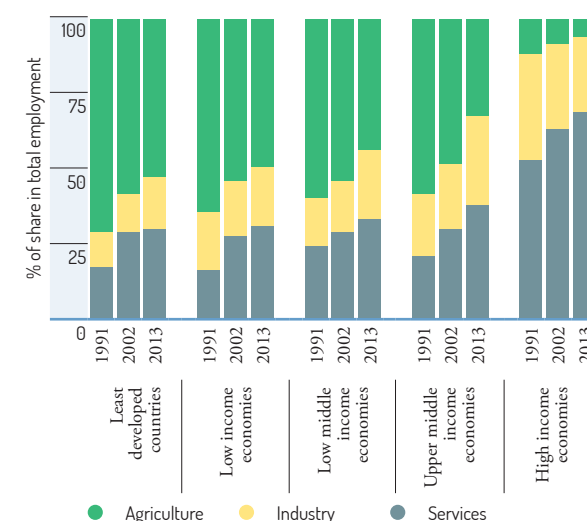
Simultaneously, trade integration has increased in the region (Figure D3). This presents an opportunity for developing economies to expand the range of goods and

Figure D1 Share of employment by sector, Asia-Pacific subregions, 1991, 2002 and 2013



Source: ESCAP statistical database, based on data from ILO Key Indicators of the Labour Market (accessed 15 Dec. 2015).

Figure D2 Share of employment by sector group, 1991, 2002 and 2013



Source: ESCAP statistical database, based on data from ILO Key Indicators of the Labour Market (accessed 15 Dec. 2015).



services they produce through access to external markets, increased production capabilities and diversification into more complex activities.<sup>23</sup>

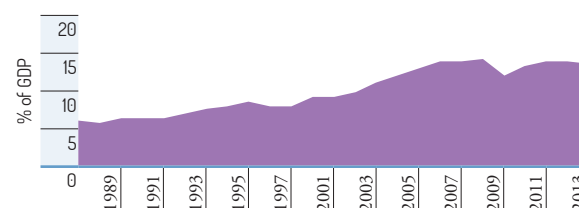
## URBANIZATION AND RISING INCOMES ARE CRITICAL DRIVERS OF ENVIRONMENTAL PRESSURES

Economies have experienced broad geographic shifts. With labour moving from agriculture to more concentrated activities in industry and services, economies have experienced massive population transfer from rural to urban areas, leading to an accelerated urbanization process. The urbanization rate (Figure D4) has increased, from less than 19.6 per cent in 1950 to nearly 48.2 per cent in 2015 and is projected to reach around 63.5 per cent in 2050, quickly catching up with the world's average.

The population living in cities represents around 55 per cent of the world's population but accounts for more than 80 per cent of total global greenhouse gas emissions.

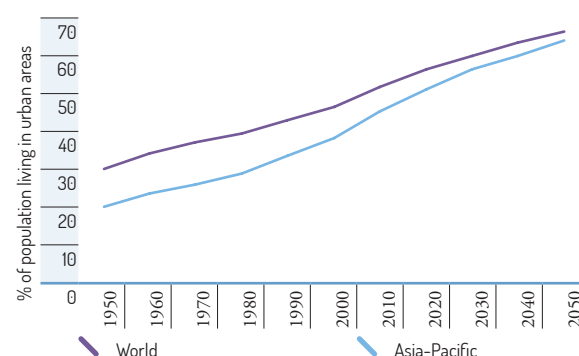
Figure D5 shows that between 1990 and 2010, average incomes increased, as reflected in the increasing share of the proportion of non-poor population in the region (calculated as the portion of population living on or above the \$2 per day threshold, at 2005 PPP). The 2012 *Green Growth, Resources and Resilience: Environmental Sustainability in Asia and the Pacific* report shows that the impact of rising incomes on increases in resource use has grown over time.<sup>24</sup> ♦

Figure D3 Intraregional exports in the Asia-Pacific region, 1989–2013



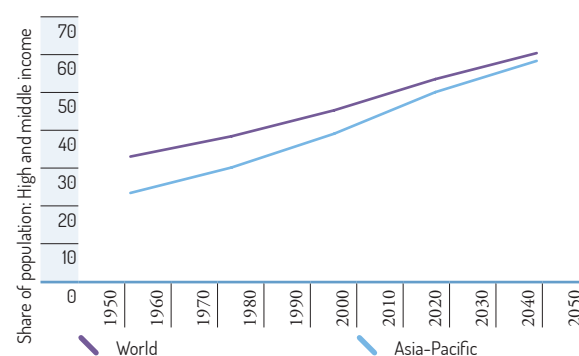
Source: ESCAP statistical database, based on Comtrade database, accessed 15 Dec. 2015).

Figure D4 Urbanization in the Asia-Pacific region, 1950–2050



Source: ESCAP statistical database, based on data from World Urbanization Prospects: The 2014 Revision (accessed 15 Dec. 2015).

Figure D5 Share of non-poor population, 1990–2010



Source: ESCAP statistical database, based on data from World Bank, Development Research Group (accessed 15 Dec. 2015).

## GLOSSARY OF TERMS

Key terms	Explanation	Source
<i>Baseline water stress</i>	Baseline water stress is the ratio of total water withdrawals to total available annual renewable supply in a given area.	Gassert and others, 2013.
<i>Change in forest cover</i>	Change in forest cover is an indicator that measures the percentage change in forest cover in areas with more than 50 per cent tree cover. It factors in areas of forest loss (including deforestation), reforestation (forest restoration or replanting) and afforestation (conversion of bare or cultivated land into forest).	Hsu and others, 2015.
<i>Dependency ratio (water)</i>	An indicator expressing the percentage of total renewable water resources originating outside the country.	FAO, 2015.
<i>Domestic material consumption (DMC)</i>	DMC is the measure of the total amount of materials directly used in the economy (used domestic extraction plus imports), minus the materials that are exported. It excludes unused domestic extraction and indirect flows of imports and exports.	United Nations, 2007.
<i>Greenhouse gas (GHG) emissions intensity</i>	The amount of GHG emissions per unit of economic output. It is expressed in tonnes of CO <sub>2</sub> equivalent per \$1,000 GDP.	ESCAP, 2014.
<i>IUCN Red List of Threatened Species</i>	International Union for Conservation of Nature's Red List is an information source on the conservation status of animal, fungi and plant species and their link to livelihoods.	IUCN.
<i>Material footprint of consumption</i>	Material footprint indicates the amount of resources or emissions that can be attributed to final demand (consumption and capital investment) in a country. It shows a responsibility of a country's consumption along the supply chain of resources and emissions that may occur anywhere in the world to satisfy final demand of that country. The footprint approach corrects the direct indicators for the upstream requirements of trade.	UNEP, 2015a.
<i>Material intensity</i>	Material intensity is a ratio of domestic material consumption (DMC) to gross domestic product (GDP) at constant prices.	United Nations, 2007.
<i>Consumption of ozone-depleting substances (ODS)</i>	An indicator showing the consumption trends for ODS controlled under the Montreal Protocol on Substances that Deplete the Ozone Layer, thereby allowing inference of the amount of ODS being eliminated as a result of the protocol.	United Nations, 2007.
<i>Total (actual) renewable water resources</i>	The sum of internal renewable water resources and natural incoming flows originating outside the country, taking into consideration the quantity of flows reserved to upstream and downstream countries through formal or informal agreements or treaties. That sum gives the maximum theoretical amount of water available in the country.	ESCAP, 2013.
<i>Total freshwater withdrawal</i>	The gross amount of water extracted, either permanently or temporarily, from surface water or groundwater sources minus those produced from non-conventional water sources, such as reused treated wastewater and desalinated water. Indicator calculations: Proportion of total freshwater withdrawal to total renewable water per annum.	ESCAP, 2013.
<i>Total primary energy supply (TPES)</i>	TPES is an indicator that reflects the annual supply of commercial primary energy and is calculated as the sum of energy production, net imports and net stock changes minus energy used for international shipping and aviation.	ESCAP, 2011.

## ENDNOTES

- 1 Steffen and others, 2015.
- 2 Rockström and others, 2009.
- 3 FAO, 2014a.
- 4 ESCAP, 2013.
- 5 Gassert and others, 2013.
- 6 Rockström and others, 2009, p. 32.
- 7 Lenzen, and others, 2012.
- 8 For more information on the state of biodiversity in South-East Asia, please check the upcoming second publication of the ASEAN Biodiversity Outlook that will be available from [www.aseanbiodiversity.org/](http://www.aseanbiodiversity.org/) in 2016.
- 9 This includes only 26 countries for which data are available: Afghanistan, Australia, Bangladesh, Bhutan, Cambodia, China, Fiji, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Pakistan, Papua New Guinea, Democratic People's Republic of Korea, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, Viet Nam.
- 10 Data presented in this section are adopted from ESCAP, 2016, based on data from Schandl and others, 2015. Available from [uneplive.unep.org](http://uneplive.unep.org).
- 11 Ibid.
- 12 Data presented in this section are from ESCAP, 2015a.
- 13 Ibid.
- 14 Ibid.
- 15 Data presented in this section are adopted from ESCAP, 2016 forthcoming.
- 16 See ESCAP, 2016.
- 17 Ibid.
- 18 Data presented in this section are adopted from ESCAP, 2016 forthcoming.
- 19 Based on SEA4ALL Global Tracking Framework.
- 20 See ESCAP, 2016.
- 21 ADB, 2015.
- 22 Data presented in this section are adopted from ESCAP, 2015b.
- 23 See Rodrik, 2015.
- 24 ESCAP, ADB and UNEP, 2012.

## REFERENCES

- Asian Development Bank (2015). *Sustainable Energy for All: Tracking Progress in Asia and the Pacific: A Summary Report*. Manila. Available from [www.se4all.org/wp-content/uploads/2015/10/se4all-tracking-progress.pdf](http://www.se4all.org/wp-content/uploads/2015/10/se4all-tracking-progress.pdf).
- Braimoh, A.K., and others (2010). Climate and human-related drivers of biodiversity decline in Southeast Asia. *The United Nations University Institute of Advanced Studies Policy Report*. Yokohama, Japan: United Nations University. Available from [http://archive.ias.unu.edu/resource\\_centre/UNU-IAS%20Climate%20e-ver.pdf](http://archive.ias.unu.edu/resource_centre/UNU-IAS%20Climate%20e-ver.pdf).
- Brown, A., and M.D. Matlock (2011). A review of water scarcity indices and methodologies. *White Paper* No. 106 (April). Tempe, Arizona: The Sustainability Consortium. Available from [www.sustainabilityconsortium.org/wp-content/themes/sustainability/assets/pdf/whitepapers/2011\\_Brown\\_Matlock\\_Water-Availability-Assessment-Indices-and-Methodologies-Lit-Review.pdf](http://www.sustainabilityconsortium.org/wp-content/themes/sustainability/assets/pdf/whitepapers/2011_Brown_Matlock_Water-Availability-Assessment-Indices-and-Methodologies-Lit-Review.pdf).
- Conservation International (2011). Biodiversity Hotspots Revisited. Conservation synthesis. Arlington, Virginia: Center for Applied Biodiversity Science. Available from <http://databasin.org/datasets/23fb5da1586141109fa6f8d45de0a260>.
- Conservation International (2015). Hotspots. Available from [www.conservation.org/How/Pages/Hotspots.aspx](http://www.conservation.org/How/Pages/Hotspots.aspx).
- Environmental Performance Index (2015). Issue profile: Forests. Available from <http://epi.yale.edu/our-methods/forests>.
- Food and Agriculture Organization of the United Nations (2014a). *State of Food and Agriculture in Asia and the Pacific*. Bangkok. Available from <http://www.fao.org/docrep/019/i3625e/i3625e.pdf>.
- \_\_\_\_\_. (2014b). *The State of World Fisheries and Aquaculture: Opportunities and Challenges*. Rome. Available from [www.fao.org/3/a-i3720e.pdf](http://www.fao.org/3/a-i3720e.pdf).
- \_\_\_\_\_. (2015a). FAOSTAT. Available from <http://faostat3.fao.org/home/E>.
- \_\_\_\_\_. (2015b). AQUASTAT. Available from [www.fao.org/nr/water/aquastat/main/index.stm](http://www.fao.org/nr/water/aquastat/main/index.stm).
- \_\_\_\_\_. (2015c). Food security indicators (12 October). Available from <http://bit.ly/14FRxGV>.
- \_\_\_\_\_. (2015d). *Global Forest Resources Assessment 2015 – How Are the World's Forests Changing?* Rome. Available from [www.fao.org/3/a-i4793e.pdf](http://www.fao.org/3/a-i4793e.pdf).
- Gassert, F., and others (2013). Aqueduct country and river basin rankings: A weighted aggregation of spatially distinct hydrological indicators. *WRI Working Paper* (December). Washington D.C.: World Resource Institute. Available from [www.wri.org/sites/default/files/aqueduct\\_country\\_rankings\\_010914.pdf](http://www.wri.org/sites/default/files/aqueduct_country_rankings_010914.pdf).
- Hansen, M.C., and others (2013). High-resolution global maps of 21st-century forest cover change. *Science*, vol. 342, No. 6160 (November), pp. 850–853.
- Hoekstra, A.Y., A.K. Chapagain, and H.H.G. Savenije (2005). Saving water through global trade. *Value of Water Research Report Series* No.17 (September). Delft, Netherlands: UNESCO-IHE Institute for Water Education. Available from <http://waterfootprint.org/media/downloads/Report17.pdf>.
- Hsu, A., and others (2014). *The 2014 Environmental Performance Index*. New Haven, Connecticut: Yale Center for Environmental Law & Policy. Available from [http://issuu.com/yaleepi/docs/2014\\_epi\\_report](http://issuu.com/yaleepi/docs/2014_epi_report).
- International Energy Agency (IEA) and the World Bank (2015). *Sustainable Energy for All 2015—Progress Toward Sustainable Energy* (June). Washington, D.C.: World Bank. Doi: 10.1596/978-1-4648-0690-2 License: Creative Commons Attribution CC BY 3.0 IGO.
- Intergovernmental Panel on Climate Change (2014). *Climate Change 2014 Synthesis Report: Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva.
- International Council for Science (n.d). Oceans Acidification, expert assessment. Launched at UNFFF COP-19. Available from [www.icsu.org/news-centre/news/top-news/expert-assessment](http://www.icsu.org/news-centre/news/top-news/expert-assessment).

- International Geosphere-Biosphere Programme, Intergovernmental Oceanographic Commission, and Scientific Committee on Ocean Research (2013). 'Ocean Acidification Summary for Policymakers 2013. Third Symposium on the Ocean in a High-CO<sub>2</sub> World. Stockholm. Available from [www.igbp.net/download/18.30566fc6142425d6c91140a/1385975160621/OA\\_spm2-FULL-lorenz.pdf](http://www.igbp.net/download/18.30566fc6142425d6c91140a/1385975160621/OA_spm2-FULL-lorenz.pdf).
- International Human Dimensions Programme on Global Environmental Change (2014). *Land, Water, and People: From Cascading Effects to Integrated Flood and Drought Responses: Summary for Decision-Makers*. Bonn. Available from [www.ihdp.unu.edu/docs/Publications/Secretariat/Reports/SDMs/Land,%20Water,%20and%20People%20-%20SDM.pdf](http://www.ihdp.unu.edu/docs/Publications/Secretariat/Reports/SDMs/Land,%20Water,%20and%20People%20-%20SDM.pdf).
- International Union for Conservation of Nature (2015). Red list of threatened species. Available from [www.iucnredlist.org/](http://www.iucnredlist.org/).
- Lenzen, M., and others. (2012). International trade drives biodiversity threats in developing nations. *Nature*, vol. 486, No. 7401 (June), pp. 109–112. Available from <http://mahb.stanford.edu/wp-content/uploads/2012/02/Nature-2012-Lenzen.pdf>.
- Maddocks, A., and others. (2015). *Ranking the World's Most Water-Stressed Countries in 2040*. Washington, D.C.: World Resource Institute. Available from [www.wri.org/blog/2015/08/ranking-world%E2%80%99s-most-water-stressed-countries-2040](http://www.wri.org/blog/2015/08/ranking-world%E2%80%99s-most-water-stressed-countries-2040).
- Milligan, H., L.M. Deinet, and R. Freeman. (2014). *Protecting Species: Status and Trends of the Earth's Protected Areas*. London: Zoological Society of London. Available from [http://admin.zsl.org/sites/default/files/media/2014-11/protected\\_species\\_final\\_20141112.pdf](http://admin.zsl.org/sites/default/files/media/2014-11/protected_species_final_20141112.pdf).
- Rodrik, D. (2015). Premature deindustrialization. *NBER Working Paper* No. 20935, Cambridge, Massachusetts: National Bureau of Economic Research. Available from: [www.nber.org/papers/w20935#navDiv=6](http://www.nber.org/papers/w20935#navDiv=6).
- PwC (2014). *Asset Management 2020: A Brave New World*. Available from [www.pwc.com/gx/en/asset-management/publications/pdfs/pwc-asset-management-2020-a-brave-new-world-final.pdf](http://www.pwc.com/gx/en/asset-management/publications/pdfs/pwc-asset-management-2020-a-brave-new-world-final.pdf).
- Rockström, J.W., and others (2009). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society*, vol.14, No.2.
- Schandl, H., and others (2015). *Indicators for a Resource Efficient and Green Asia and the Pacific - Measuring Progress of Sustainable Consumption and Production, Green Economy and Resource Efficiency Policies in the Asia-Pacific Region*. Bangkok: United Nations Environment Programme. Available from [http://greeninfo.asia/Publications/Indicator-for-a-RE\(Low-resolution\).pdf](http://greeninfo.asia/Publications/Indicator-for-a-RE(Low-resolution).pdf).
- Secretariat of the Convention on Biological Diversity (2010). *Global Biodiversity Outlook 3*. Montreal. Available from [www.cbd.int/doc/publications/gbo/gbo3-final-en.pdf](http://www.cbd.int/doc/publications/gbo/gbo3-final-en.pdf).
- Srisathanan, G., and S. Funge-Smith (2011). *The Potential Impact of Climate Change on Fisheries and Aquaculture in the Asian Region*. Bangkok: Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific. Available from [www.fao.org/3/a-ba0083e.pdf](http://www.fao.org/3/a-ba0083e.pdf).
- Steffen, W., and others (2015). Planetary boundaries: Guiding human development on a hanging planet. *Science*, vol. 347, No. 6223 (February).
- United Nations, Department of Economic and Social Affairs (2007). *Indicators of Sustainable Development: Guidelines and Methodologies*. 3rd Edition. New York. Available from [www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf](http://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf).
- United Nations Development Programme (2014). *Human Development Report 2014: Sustaining Human Progress: Reducing Vulnerabilities and Building Resilience*. New York. Available from [hdr.undp.org/sites/default/files/hdr14-report-en-1.pdf](http://hdr.undp.org/sites/default/files/hdr14-report-en-1.pdf).
- United Nations, Economic and Social Commission for Asia and the Pacific (2012). Widening energy access and enhancing energy security to achieve the Millennium Development Goals in Asia and the Pacific. *ESCAP Energy Resources Development Series* No. 42 (December). Accessed from [www.unescap.org/sites/default/files/Energy-Resources-Development-Series-42.pdf](http://www.unescap.org/sites/default/files/Energy-Resources-Development-Series-42.pdf).
- \_\_\_\_\_ (2013). *Statistical Yearbook for Asia and the Pacific 2013*. Bangkok. Sales No. E.13.II.F.1.
- \_\_\_\_\_ (2014). *Statistical Yearbook for Asia and the Pacific 2014*. Bangkok. (ST/ESCAP/2704). Available from [unescap.org/sites/default/files/ESCAP-SYB2014.pdf](http://unescap.org/sites/default/files/ESCAP-SYB2014.pdf).
- \_\_\_\_\_ (2015a). Asia Pacific Energy Portal. Available from [www.asiapacificenergy.org/](http://www.asiapacificenergy.org/).
- \_\_\_\_\_ (2015b). ESCAP statistical database. Available from [www.unescap.org/stat/data/statdb/DataExplorer.aspx](http://www.unescap.org/stat/data/statdb/DataExplorer.aspx).



- 
- \_\_\_\_\_ (2016). *Statistical Yearbook for Asia and the Pacific 2015*. Bangkok.
- United Nations Economic and Social Commission for Asia and the Pacific, Asian Development Bank, United Nations Environment Programme (2012). *Green Growth, Resources and Resilience: Environmental Sustainability in Asia and the Pacific*. Bangkok. Available from [www.unescap.org/resources/green-growth-resources-and-resilience-environmental-sustainability-asia-and-pacific](http://www.unescap.org/resources/green-growth-resources-and-resilience-environmental-sustainability-asia-and-pacific).
- United Nations Environment Programme (2008). *Vital Water Graphics: An Overview of the State of the World's Fresh and Marine Waters*. 2nd Edition. Nairobi. Available from [www.unep.org/dewa/vitalwater/](http://www.unep.org/dewa/vitalwater/).
- \_\_\_\_\_ (2012). *Keeping Track of Our Changing Environment: From Rio to Rio+20 (1992-2012)*. Nairobi. Available from [www.unep.org/geo/pdfs/keeping\\_track.pdf](http://www.unep.org/geo/pdfs/keeping_track.pdf).
- \_\_\_\_\_ (2015b). Ozone Secretariat Data Access Centre. Available from <http://ozone.unep.org/en/data-reporting/data-centre> (accessed 23 November 2015).
- \_\_\_\_\_ (2015c). *Resource Use in the Asia-Pacific: A Booklet of Infographics*. Bangkok. Available from [http://greeninfo.asia/Publications/Infographic\(Low-resolution\).pdf](http://greeninfo.asia/Publications/Infographic(Low-resolution).pdf).
- Villasante, S., and others (2012). The Global Seafood Market Performance Index: A theoretical proposal and potential empirical applications. *Marine Policy*, vol. 36, No 1, pp. 142–152.
- World Health Organization (2012). *Burden of Disease from Ambient Air Pollution for 2012*. Geneva. Available from [www.who.int/phe/health\\_topics/outdoorair/databases/AAP\\_BoD\\_results\\_March2014.pdf](http://www.who.int/phe/health_topics/outdoorair/databases/AAP_BoD_results_March2014.pdf).
- \_\_\_\_\_ (2014). Air quality deteriorating in many of the world's cities. 7 May. Available from [www.who.int/mediacentre/news/releases/2014/air-quality/en/](http://www.who.int/mediacentre/news/releases/2014/air-quality/en/).
- World Wide Fund for Nature (2014). *Living Planet Report 2014: Species and Spaces, People and Places*. Gland, Switzerland. Available from [http://ba04e385e36eed47f9c-abbcd57a2a90674a4bcb7fab6c6198d0.r88.cf1.rackcdn.com/Living\\_Planet\\_Report\\_2014.pdf](http://ba04e385e36eed47f9c-abbcd57a2a90674a4bcb7fab6c6198d0.r88.cf1.rackcdn.com/Living_Planet_Report_2014.pdf).



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*Transformations for Sustainable Development: Promoting Environmental Sustainability in Asia and the Pacific*

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The report is designed to help governments and other actors prepare to translate the 2030 Agenda for Sustainable Development—a plan for people, planet, prosperity, peace and partnership—into their country context. Although “transformation” became a buzzword during the negotiation of this agenda, how to apply it was less discussed. This report emphasizes that the Sustainable Development Goals will only be achieved when Asia-Pacific megatrends are managed in a way that creates opportunities for achieving development outcomes that are in line with environmental limits. It explores transformations in social justice, patterns of resource use, economic structural change and investment flows to deepen action at the national and regional levels on the environmental dimension of sustainable development.

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