

Asia-Pacific Synergies Report

Advancing Synergistic Solutions to the Triple Planetary Crisis and the SDGs



ESCAP
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Asia-Pacific Synergies Report

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Abbreviations

ADB	Asian Development Bank
AI	artificial intelligence
CES	circulating and ecological sphere
CBD	Convention on Biological Diversity
COP	Conference of the Parties
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
ESG	environment, social and governance
GBF	Global Biodiversity Framework
GDP	gross domestic product
GHG	greenhouse gases
GIS	geographic information systems
GST	Global Stocktake
IAM	Integrated Assessment Model
IEA	International Energy Agency
IGES	Institute for Global Environmental Strategies
IPCC	Intergovernmental Panel on Climate Change
ILK	Indigenous and local knowledge
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
KMGBF	Kunming-Montreal Global Biodiversity Framework
KPIs	key performance indicators
LBSAPs	Local Biodiversity Strategy and Action Plans
LDC(s)	Least Developed Country(ies)
LT-LEDS	Long-Term Low Emission Development Strategy(ies)
MDB	multilateral development banks
MEA	multilateral environment agreements
NAP(s)	National Adaptation Plan(s)
NbS	nature-based solutions
NBSAPs	National Biodiversity Strategy and Action Plans
NDCs	Nationally Determined Contribution(s)
NFF	Nature Futures Framework
NGOs	non-governmental organizations
NO _x	nitrogen oxide
PM _{2.5}	particulate matter 2.5 micrometres
PPP	public-private partnerships
SDGs	Sustainable Development Goals
SEPLS	Socioecological Production Landscapes and Seascapes
SIDS	small island developing States
SMEs	small- and medium-sized enterprises
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN-Habitat	United Nations Human Settlements Programme
US\$	United States dollar

Executive summary

The Asia-Pacific region stands at a decisive moment in its development trajectory. Although some progress has been made, the region remains off track to achieve the Sustainable Development Goals (SDGs) as the interrelated climate, biodiversity and pollution crises intensify broader socioeconomic challenges, including rising affordability concerns and widening equity gaps.

While such an outlook is concerning, this *Asia-Pacific Synergies Report* argues that the region can convert interrelated planetary challenges into an opportunity for transformative change through synergies. Understood as the intentional alignment and integration of policies, actions, stakeholders and systems across sectors, governance levels and means of implementation (including finance, data and governance), synergies offer pathways that generate outcomes greater than the sum of their individual parts. Furthermore, synergies can enhance cost-efficiency, equity and resilience while accelerating progress on the SDGs by addressing the triple planetary crises. Synergistic approaches recognize and leverage dynamic interactions across environmental, social and economic systems, enabling policymakers to address interlinked challenges in a more coherent and transformative manner.

This report synthesizes experiences from the Asia-Pacific region on translating synergies into practical, policy-relevant lessons for decision makers at multiple levels. In so doing, it argues that synergies should be positioned as a core organizing principle in policies and actions toward 2030 and beyond.

Sustainability challenges are interconnected

For over a decade, countries in the Asia-Pacific region have sought to become economically competitive and resilient, net-zero and circular, nature-positive and inclusive, while also ensuring the health and well-being of nearly 5 billion people and that no one is left behind. Despite notable strides forward in each of these areas, progress on the SDGs has slowed rather than accelerated.

This slow progress is partly driven by the inherently interconnected nature of the environmental and other crises the region faces. Climate change exacerbates biodiversity loss and pollution; degraded ecosystems undermine food security, health and disaster resilience; and pollution compounds climate and health risks, particularly in cities. In addition, inequalities across income groups, genders and geographies often mean that those with the least bear the greatest burdens. Balancing these multiple priorities becomes more difficult as governments and other stakeholders face pressure to address these intersecting challenges with limited resources and capacities. Further, governments often confront additional constraints due to siloed institutions, policies and investments. These fragmented approaches are insufficient to address the scale and complexity of overlapping and cascading threats to a sustainable future. Converting these threats into opportunities requires leveraging synergies across Asia and the Pacific.

Asia and the Pacific is home to many synergistic solutions

With its unique capacity for innovation and home-grown responses, the Asia-Pacific region demonstrates a wide range of synergistic solutions to climate change, biodiversity loss, pollution and other developmental challenges.

However, progress has been lagging behind in mainstreaming synergies, hampered by a lack of collaborative and systematic efforts that synthesize experiences with cross-cutting solutions to generate transferable lessons. Such a synthesis can help policymakers and other stakeholders integrate synergies into local and national policies as well as regional frameworks. This report argues that policymakers must consistently incorporate synergies into policies and frameworks at multiple levels. Further, the report emphasizes that the diversity in development pathways, technologies and natural resource endowments makes the Asia-Pacific region well placed to identify and scale synergistic solutions, both within and beyond the region.

Policymakers in Asia and the Pacific can work through four entry points for synergies to seed transformative change

For many policymakers, the first step in leveraging synergies is identifying entry points to plant the seeds of wider systemic change. The report presents 36 cases, along with 150 additional case studies in an online appendix, that provide concrete examples of the kinds of entry points that can advance synergies. Drawing on these cases, the report also identifies four transformation pathways that can help policymakers leverage synergies to accelerate progress across multiple SDGs.

- 1. Health-centred climate action** is a powerful driver of ambition and equity. Climate change is already a defining health challenge in the region, shaping public concern, and influencing political priorities and investment decisions. Framing climate action as contributing to better health and well-being can generate local benefits such as cleaner air, safer temperatures and more resilient food systems that are potentially more tangible than climate benefits. When health is positioned not only as an outcome but as a driver of climate action, it strengthens political feasibility, supports just transitions and accelerates integrated action across energy, food and urban systems. Concrete national actions include integrating health considerations into Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), and Long-Term Low Emission Development Strategies (LT-LEDS) and other climate policies, and embedding health and equity indicators into climate monitoring and decision-making frameworks.
- 2. Nature-positive nexus approaches** to development provide pathways that maximize connections and manage trade-offs across food, water, climate and health objectives. The Asia-Pacific region is home to extraordinary biodiversity, yet ecosystem degradation continues at alarming rates. Treating biodiversity as a standalone policy area is both insufficient and inefficient. Instead, nature-positive development pathways integrate ecosystem integrity into broader economic and social decision-making, supported by the plural valuation of nature, inclusive governance and multilevel coordination. These approaches, including incentive mechanisms to promote nature-positive actions, such as payments for ecosystem services, help align biodiversity conservation with climate resilience, food security and sustainable livelihoods.
- 3. Circular economy approaches** across core provisioning systems for food, housing, mobility and energy address pollution at its source. Pollution in the region is not an isolated problem, but a systemic outcome of how these systems are designed and governed. Circular economy strategies that prioritize upstream prevention, material efficiency and value retention, for example, through strengthened extended producer responsibility, can deliver combined benefits for pollution reduction, climate mitigation, public health and economic development.
- 4. Cities** are not only at the frontline of interconnected crises but critical delivery platforms for synergies. Indeed, cities often have the greatest potential for synergies as they concentrate emissions, resource use and vulnerability. Integrated urban planning translates national ambition into local impact. Aligning land use, housing, transport, energy, water and waste through coherent urban planning enables the pursuit of multiple benefits for resilience, inclusion and well-being. Strengthening the alignment and interface between national frameworks and subnational implementation is essential to scale synergies. In addition, empowering cities is key to ensuring that synergies move beyond a concept on paper to become a reality on the ground.

Implementing synergistic solutions requires finance, data and governance

Synergies do not emerge in a vacuum. They require an enabling environment and deliberate institutional design, supported by aligned finance, robust data and analytical tools, and effective governance arrangements to take root and scale. These include:

- 1. Financing mechanisms** that create incentives for synergies are key to making the concept actionable. Fragmented financial flows, siloed data systems and institutional separation remain major barriers across the Asia-Pacific region. Synergistic approaches require various financing mechanisms to be carefully structured to deliver multiple benefits; this often involves regulations and blending of complementary resources that motivate the consideration and optimization of multiple benefits.
- 2. Integrated data systems and analytical tools** can advance synergies. While overall data availability has improved, critical data gaps persist for climate action, biodiversity, pollution, cities and governance. Integrated decision-making requires data systems that concretely illustrate interlinkages, co-benefits and trade-offs, and that are accessible across sectors and levels of government. Investing in national data infrastructure and analytical platforms for integrated SDG analysis, scenario modelling and synergy tracking can help visualize interlinkages among SDGs, enabling evidence-based decision-making to become more coherent.

3. Effective governance arrangements can align interests across sectors and stakeholders. Governance is therefore not only a critical enabler of synergies but also supports and aligns other enablers, including finance, data and analytical tools. Governance arrangements must move beyond coordination in principle to institutionalized mechanisms that align mandates, budgets and accountability across ministries and between national and local levels. Such arrangements can be advanced through small-scale tactical experiments that promote learning and formal multi-stakeholder partnerships that leverage established goals, towards more transformative whole-of-government approaches that institutionalize integration between development and environmental priorities. A whole-of-society approach, moreover, remains an important pre-condition to achieve genuinely inclusive and participatory governance arrangements.

Regional cooperation is critical to scaling synergies

Regional cooperation plays a critical role in developing and implementing synergistic solutions through shared frameworks and platforms, while supporting the scaling of synergistic approaches from pilots to policy. By synthesizing diverse local and sectoral experiences, regional cooperation can convert fragmented initiatives into boundary-spanning solutions, harmonize approaches, reduce duplication and lower implementation risks. Regional platforms enable countries and cities to jointly design, test and deploy responses to transboundary challenges, including climate impacts, pollution and ecosystem degradation, and strengthen peer learning, capacity development and coherence between national and subnational actions.

Strategic directions to move synergies forward

To accelerate progress toward the SDGs and address the triple planetary crisis, the report highlights six strategic directions for policymakers and partners across the Asia-Pacific region:

Strategic direction 1: Make synergies the organizing principle for national development strategies, climate action, biodiversity conservation, pollution control and urban policy.

Strategic direction 2: Empower cities and subnational governments to serve as delivery platforms for synergistic solutions, supported by predictable finance and technical capacity.

Strategic direction 3: Promote cross-sectoral investment by aligning finance with multi-benefit outcomes across climate, biodiversity, pollution and other development priorities to drive systemic changes.

Strategic direction 4: Transform data and tools into accessible and actionable resources for routine decision-making on synergies.

Strategic direction 5: Institutionalize whole-of-government and whole-of-society governance approaches, with clear mandates, shared indicators and aligned incentives.

Strategic direction 6: Leverage regional cooperation to synthesize evidence, harmonize approaches, promote learning and scale synergistic solutions across diverse contexts.

Looking ahead toward 2030 and beyond

Synergistic approaches offer a practical and necessary pathway toward a future where human health and well-being, environmental sustainability and economic competitiveness and resilience are mutually reinforcing. By moving beyond fragmented responses and embedding synergies into policy, planning and investment decisions, the Asia-Pacific region can turn interconnected crises into a virtuous cycle of opportunities for transformation. The experiences, lessons and directions outlined in this report are intended to support policymakers, practitioners and partners in translating ambition into action, and contribute to shaping the future of sustainable development toward and beyond 2030.

CHAPTER 1

Introduction



1.1 The challenge

In 2015, the international community agreed on 17 potentially transformative Sustainable Development Goals (SDGs). Shortly thereafter, the Paris Agreement was adopted at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP21), signalling a shared commitment to strengthening global responses to climate change. Although delayed by the COVID-19 pandemic, the Kunming-Montreal Global Biodiversity Framework (KMGBF) followed these milestone agreements, calling on countries to work toward achieving 4 long-term goals and 23 specific targets aimed at halting and reversing biodiversity losses as well as safeguarding nature. Around the same period, an Intergovernmental Negotiating Committee (INC) was convened to develop an international legally binding instrument on plastic pollution, including in the marine environment. Together, these agreements and negotiations fostered a sense of optimism that the world was willing and able to tackle the interconnected crises of climate change, biodiversity loss and pollution.

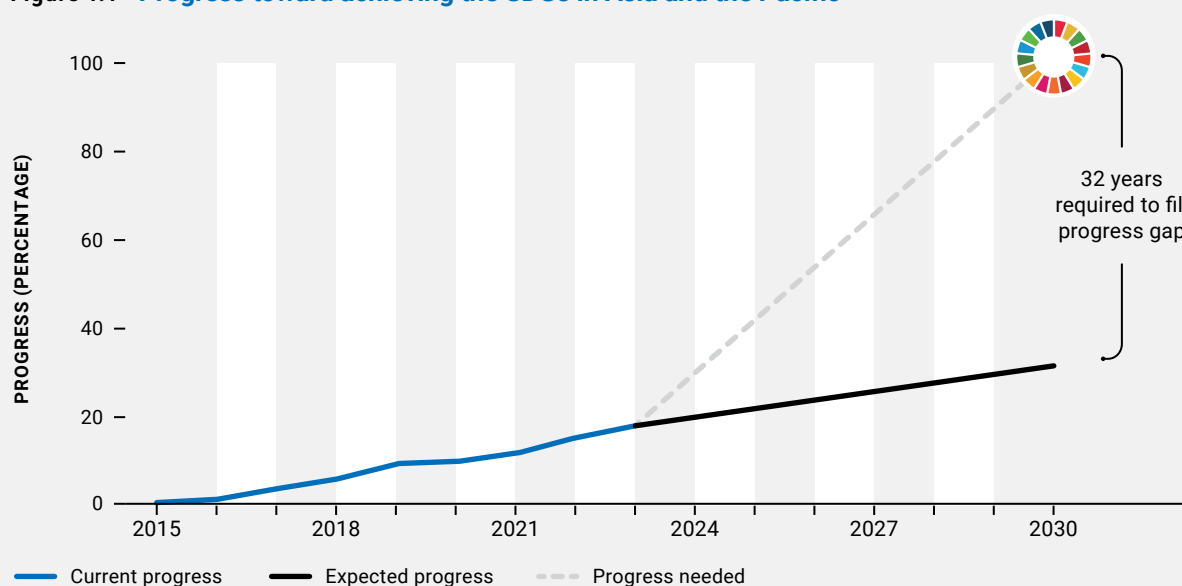
Over the past decade, however, this optimism has given way to more sobering assessments of the scale and complexity of addressing these interrelated planetary challenges. Globally, climate change is continuing at or near record levels (WMO, 2026). Current policies and financing commitments remain insufficient to limit global warming to 1.5°C during the 21st century (IPCC, 2022). At the same time, biodiversity conservation and restoration efforts continue to be significantly under-resourced relative to their social, economic

and ecological benefits (IPBES, 2024a). While many developed countries have reduced waste generation and improved resource efficiency, developing countries have increasingly become destinations for waste exports and plastic pollution, often without the infrastructure or capacities to transition to circular economic models (UNEP, 2024b). Broader progress on the SDGs has also been underwhelming with only around 18 per cent of targets currently on track globally (United Nations, 2025).

These global trends unfortunately mirror what has unfolded in the Asia-Pacific region. While the region has made strides on some fronts, for instance, reducing poverty and expanding access to essential water and sanitation services, progress on the SDGs has remained frustratingly slow, with regression observed in many policy areas (ESCAP, 2025). At current rates of progress, the region would require an estimated 32 additional years to achieve the full set of SDGs (ESCAP, 2025) (figure 1.1).

The same sobering assessment applies to the region's progress on key issues such as climate change. Home to around 60 per cent of the world's population, several countries in Asia and the Pacific contribute significantly to the continuing increase of global greenhouse gas (GHG) emissions, while temperatures in the region are also increasing more rapidly than the global average (WMO, 2025). The region's high exposure and vulnerability to a warming climate are further evidenced by the fact that three of the ten countries most affected by climate-related impacts between 1995 and 2024 are in Asia and the Pacific (Adil and others, 2025).

Figure 1.1 Progress toward achieving the SDGs in Asia and the Pacific



Source: *Asia and the Pacific SDG Progress Report 2024: Showcasing Transformative Actions* (United Nations publication, 2024).

Note: For each year, the percentage represents the average progress recorded towards all 17 SDGs.

Biodiversity is another area of concern. The Asia-Pacific region hosts a disproportionately large share of global biodiversity, including 17 of the world's 36 biodiversity hotspots and 7 of the 17 megadiverse countries (Conservation International, 2016; UNEP-WCMC, 2020). Despite this richness, biodiversity is under threat, with around a quarter of assessed species in the region facing a high risk of extinction (IUCN, 2021). These pressures are particularly acute in coastal ecosystems. The region contains approximately 50 per cent of the world's mangroves, yet it has accounted for over 60 per cent of global mangrove losses since the late 20th century (FAO, 2020). Marine ecosystems are under similar intense stress. The Asia-Pacific region hosts most of the world's coral reefs, including the global centre of marine biodiversity in South-East Asia, where more than 90 per cent of reefs are considered threatened (Souter and others, 2021). Terrestrial ecosystems have also been heavily degraded. In South-East Asia, around half of tropical peatlands have been drained or burned since 1990, largely due to agricultural expansion and land-use change (FAO, 2020; Cahyaningtyas, 2018). Across the wider Asia-Pacific region, an estimated 25 million hectares of naturally regenerating forest were lost between 1990 and 2020, based on the Food and Agriculture Organization of the United Nations (FAO) *Global Forest Resources Assessment* (FAO, 2020).

Pollution also remains a severe and persistent challenge across the Asia-Pacific region. All but one of the world's 20 cities with the most polluted air are in Asia (IQair, 2025), and 70 per cent of the world's air pollution-related deaths are from the region (UNEP, 2024c). Marine plastic pollution presents an additional challenge, with countries in Asia and the Pacific responsible for an estimated 81 per cent of global plastic input to the ocean (Meijer and others, 2021). The Asia-Pacific region also accounts for approximately 60 per cent of global material use, yet its material productivity remains significantly below the global average (Schandl and others, 2024). This is largely because performance on the circular economy remains limited in many parts of the region. In South-East Asia, for instance, circularity rates are estimated to be far lower than in the European Union, where the circular material use rate reached around 12.2 per cent in 2024 (Circle Economy, 2023; EEA, 2025).

Many of these challenges are closely linked to the region's rapid urbanization. More than half of the population in Asia and the Pacific lives in urban areas, and this is projected to increase by 50 per cent by 2050. Cities are major drivers of environmental pressures, accounting for around 70 per cent of global GHG emissions (UN-Habitat, 2020; IPCC, 2022). Simultaneously, urban areas in Asia and the Pacific often face disproportionate exposure to environmental and hazard risks, with adaptation planning being more reactive than proactive (Dulal and others, 2019). As noted previously, air pollution is also a major threat to sustainable urban development, with most city residents in the region exposed to air quality levels exceeding World Health Organization (WHO) guidelines (WHO, 2021).

Addressing these interconnected challenges depends critically on the availability of finance, robust data and analytical tools, and effective governance arrangements. Despite recent increases in climate-related finance, the Asia-Pacific region continues to face a substantial financing gap. Moreover, financial flows remain unevenly distributed across both thematic priorities and subregions. Climate mitigation attracts significantly more funding than climate adaptation and biodiversity. At the same time, in much of Asia, climate finance remains concentrated in a few key countries and is, again, chiefly for mitigation (Watson, Schalatek and Evéquoz, 2025).

Integrated approaches can simultaneously advance climate mitigation, public health protection and sustainable development.

The Asia-Pacific region performs relatively well in terms of overall data availability for SDG indicators compared to other parts of the world. However, significant gaps persist for several critical goals, including Gender Equality (SDG 5), Sustainable Cities and Communities (SDG 11), Climate Action (SDG 13), Life Below Water (SDG 14), and Peace, Justice and Strong Institutions (SDG 16). In contrast, data coverage is stronger for goals such as Affordable and Clean Energy (SDG 7), Life on Land (SDG 15) and Partnerships for the Goals (SDG 17) (ESCAP, 2025).

Governance arrangements across the region are diverse but limits on capacity and coordination constraints often result in persistent implementation gaps. These challenges tend to be the greatest in countries with lower incomes and fewer resources. There can also be few channels for those most adversely affected by environmental crises to articulate concerns and press for changes (Li and Puppim de Oliveira, 2021).

Slow progress in addressing the triple planetary crisis and the SDGs is partly due to the inherently interconnected nature of environmental and other challenges. A warmer climate can harm biodiversity while degraded natural systems make climate impacts more acute. A similar web of interactions exist between the effects of pollution on climate and natural systems. These interrelated environmental challenges can also widen gaps between the "haves" and "have-nots" and become triggers of socioeconomic instability.

1.2 The opportunity

How can the Asia-Pacific region turn these challenges into opportunities? One answer lies in a concept that is increasingly gaining traction across and beyond Asia and the Pacific: synergies. Synergies refer to dynamic interactions across issues, stakeholders, governance levels and means of implementation that emerge from

deliberate efforts to align and integrate responses to climate change, biodiversity loss, pollution and other sustainability challenges (Box 1.1). By harnessing potentially dynamic interactions, policymakers and other stakeholders can achieve combined outcomes that are greater than the sum of their isolated, issue-specific parts (United Nations, 2023).

Box 1.1 Defining synergies

Synergies refer to the deliberate alignment and integration of policies, actions, stakeholders, governance levels and means of implementation (finance, data and tools, and governance) across multiple sustainability domains, such as climate change, biodiversity, pollution and socioeconomic development, to generate outcomes that are greater than the sum of issue-specific efforts.

Synergies are not incidental but the result of intentional, coordinated approaches that recognize interdependencies across environmental and socioeconomic systems. By designing responses that work across issues, levels of decision-making and means of implementation, synergies can improve effectiveness, boost cost efficiency and reduce trade-offs, while delivering more equitable and transformative development outcomes.

Synergies are hence characterized by five defining features:

1. Intentional integration;
2. Multi-issue scope: addressing planetary crises such as climate, biodiversity and pollution, and development together;
3. Multi-actor and multilevel coordination, spanning sectors, scales, stakeholders and governance levels;
4. Efficiency and amplification effects, producing outcomes greater than isolated interventions;
5. Transformative potential, including potential for scaling solutions and social goals including equity, justice and “leave no one behind” outcomes.

The term “synergy” is often used synonymously with or related to the following terms:

- **Systems thinking:** Examines the dynamic, interconnected behaviour of social, economic and ecological systems.
- **Nexus thinking:** Identifies where systems interact most strongly, for example, food-water-energy-climate, and how actions in one domain produce cascading effects in others.
- **Policy coherence:** Focuses on fostering synergies and maximizing benefits across policy areas and institutional frameworks; balancing domestic with international policy objectives; and addressing the transboundary and long-term impacts of policies, including in the context of sustainable development (UNEP, OECD, 2026).
- **Multi-benefit pathways:** Designed to achieve simultaneous gains, for example, lowering emissions, improving health and boosting productivity.
- **Integrated approaches:** Promote planning, budgeting and action that cut across sectors and scales, addressing problems holistically instead of through single-issue solutions.
- **Whole-of-government (and whole-of-society) approaches:** Involves coordinated action across ministries, agencies, levels of government and stakeholders.
- **Co-benefits:** Benefits that accrue beyond the primary objective of an intervention.

While this report focuses on synergies, it does not exclude other terms and approaches because, for instance, the process of pursuing co-benefits, policy coherence and integration often overlap with the process of delivering synergies.

Source: ESCAP and IGES.

As the definition provided in Box 1.1 suggests, synergistic approaches can improve efficiency by aligning resources and actions across multiple policy objectives and domains (Zhao and others, 2021). Synergistic approaches are also closely aligned with arguments in sustainability science, which emphasize that many of the most pressing environmental and social challenges are deeply interconnected (Renaud and others, 2022). When explicitly designed to strengthen links between environmental and socioeconomic dimensions of sustainable development, synergies can further contribute to more equitable and inclusive outcomes, helping to ensure that no one is left behind (Zusman and others, 2025).

Many of the potential benefits of synergistic approaches have drawn heightened attention due to a coordinated global effort to integrate climate and responses to other SDGs. Since 2023, a series of Global Synergies Reports have been published annually, demonstrating how the international community can bring about a much-needed course change in resource-intensive development by integrating responses to climate and other challenges (United Nations, 2023). This effort helped consolidate emerging thinking on synergies, while providing practical guidance on how policy frameworks (such as Nationally Determined Contributions (NDCs)) and financing mechanisms, can make synergistic approaches operational at national and subnational levels (Nilsson and others, 2024). The messages from these reports have been reinforced by two resolutions

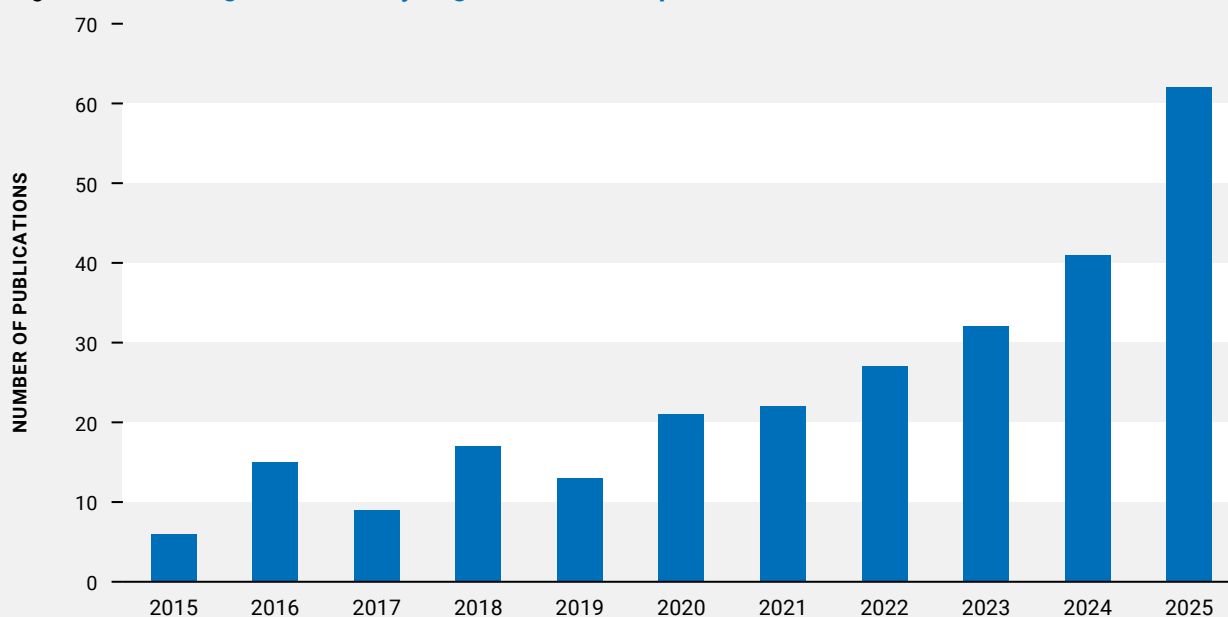
from the United Nations Environment Assembly (UNEA), which, have, *inter alia*, “invit[ed] regional and subregional cooperation bodies, including the United Nations regional economic commissions, to facilitate multilateral and multi-stakeholder cooperation for promoting synergies, cooperation or collaboration in line with nationally determined priorities” (UNEP/EA.6/Res.4 and UNEP/EA.7/Res.5).

At the same time, references to synergies have increased markedly in academic literature. As illustrated in figure 1.2, publications on synergies and climate change have grown significantly over the past decade. A similar trend is observed in major global synthesis reports (beyond the previously mentioned *series of Global Synergy Reports*). The *Global Sustainable Development Reports* (GSDR) and publications by the Intergovernmental Panel on Climate Change (IPCC) and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) have all highlighted the potential for synergies or similar concepts (Independent Group of Scientists appointed by the Secretary-General, 2023; IPCC, 2022; IPBES, 2024b).

There is also evidence that these efforts have influenced key policies. For example, most countries now reference the SDGs in their NDCs, National Adaptation Plans (NAPs) and Long-Term Low Emission Development Strategies (LT-LEDS). This practice is increasingly evident in data that reveals that 32 out of 36 countries,¹ in their NDCs 3.0, either explicitly highlight specific policy

¹ In total, 36 countries in the Asia-Pacific region have submitted their NDCs 3.0 by 10 April 2026. See UNFCCC, 2026.

Figure 1.2 Growing attention to synergies in academic publications



Source: Adapted by IGES, based on data from Scopus. Available at <https://www.scopus.com/sources>

Note: This figure is based on Scopus keyword search on “climate and synergy/ies”. It demonstrates that articles on the theme have risen sharply over the past 10 years.

coherence or the benefits of aligning SDGs and climate actions through integration into national strategies and planning frameworks. This integration is also becoming more apparent with links between climate and key social issues. For instance, the majority of countries include health as a key sector in their LT-LEDS. References to just transitions in low carbon economies as a pathway that will significantly improve the quality of life and health of the population is illustrative of a similar trend. Growing references to synergies are also apparent in adaptation planning. In their NAPs, countries have increasingly underscored that adaptive measures integrating health considerations can address the negative impacts of climate change in urban and rural areas.

While these initiatives, publications and policy decisions are welcome, they largely fall short of examining the potential for synergies in specific regional contexts. A central argument of this report is that few regions offer greater opportunities for leveraging synergies than Asia and the Pacific. This is partly because the region is home to several of the world's largest and fastest-growing economies. China² and Japan rank among the largest economies globally, while countries such as India, Indonesia and Viet Nam have recorded sustained growth rates of over 5 per cent in recent years (World Bank, 2025; IMF, 2026; DBS Bank, 2024).

The importance of focusing on the Asia-Pacific region also stems from its dual role as both a major contributor to the climate, biodiversity and pollution crisis, and one of the areas most exposed to their adverse impacts. Yet another reason for a regional focus is that the Asia-Pacific region encompasses an extraordinary diversity of countries, development pathways, and social and ecological contexts. As a result, synergistic responses developed in the region have the potential to generate lessons that are relevant not only within but beyond the region.

Such a regionally focused assessment is essential not only to strengthen policy design and coordination on paper in Asia and the Pacific, but also to support implementation and scaling of effective solutions on the ground. By integrating thematic expertise with empirical evidence from case studies (included in this report and approximately 150 cases in a supporting annex) from the region, this report illustrates how synergies can be made actionable. Toward this end, the report consists of four related objectives:

- Assess evidence of different synergistic approaches in Asia and the Pacific, and examine four interlinked transformation pathways: health-centred climate action, nature-positive nexus approaches to development, circular economy strategies, and integrated urban planning, to address the triple planetary crisis of climate, biodiversity and pollution;

- Explore how key means of implementation or enabling factors (data and tools, finance and governance) can accelerate and scale action on synergies across the region;
- Use the above assessments to suggest concrete actions for national and local policymakers, and outline ways in which regional organizations and development partners can assist policymakers in mainstreaming synergies into key decision-making processes across a range of themes and at different levels;
- Provide strategic directions for policymakers and partners in Asia and the Pacific to accelerate progress toward the SDGs and address the triple planetary crisis toward and beyond 2030.

1.3 Organization of the report

While the report examines synergies across a wide range of issues, each chapter focuses on one or two thematic areas, pathways or supportive means of implementation. Following the introduction, the first four chapters each concentrate on select thematic areas for synergies: climate and health (Chapter 2), biodiversity and nature-positive solutions (Chapter 3), pollution control and the circular economy (Chapter 4), and cities and urban resilience (Chapter 5). The remaining three chapters examine key means of implementation that can enable progress along the pathways featured in the thematic chapters: finance (Chapter 6), data and tools (Chapter 7), and governance (Chapter 8). Chapter 9 concludes by summarizing key messages and elaborating on six key directions.

The substantive chapters (Chapters 2-8) follow a similar structure that makes them accessible to different audiences. More concretely, the chapters include a set of key messages summarizing the main points. This is then followed by an introduction that highlights relevant challenges and opportunities; key synergistic approaches; illustrative case studies; enablers for scaling and replication; and key insights and recommended actions for national/local governments, regional organizations and development partners.

Figure 1.3 provides a simplified overview of the report's structure and illustrates the relationship between the thematic chapters and the chapters on means of implementation. In so doing, it also illustrates how synergistic solutions, supported by effective means of implementation or enabling reforms, can work through key entry points to drive transformative changes and accelerate progress towards the SDGs in Asia and the Pacific. The ultimate results of these efforts will be an Asia-Pacific region that is increasingly inclusive and resilient, as well as peaceful and prosperous.

2 ADB recognizes "China" as the People's Republic of China.

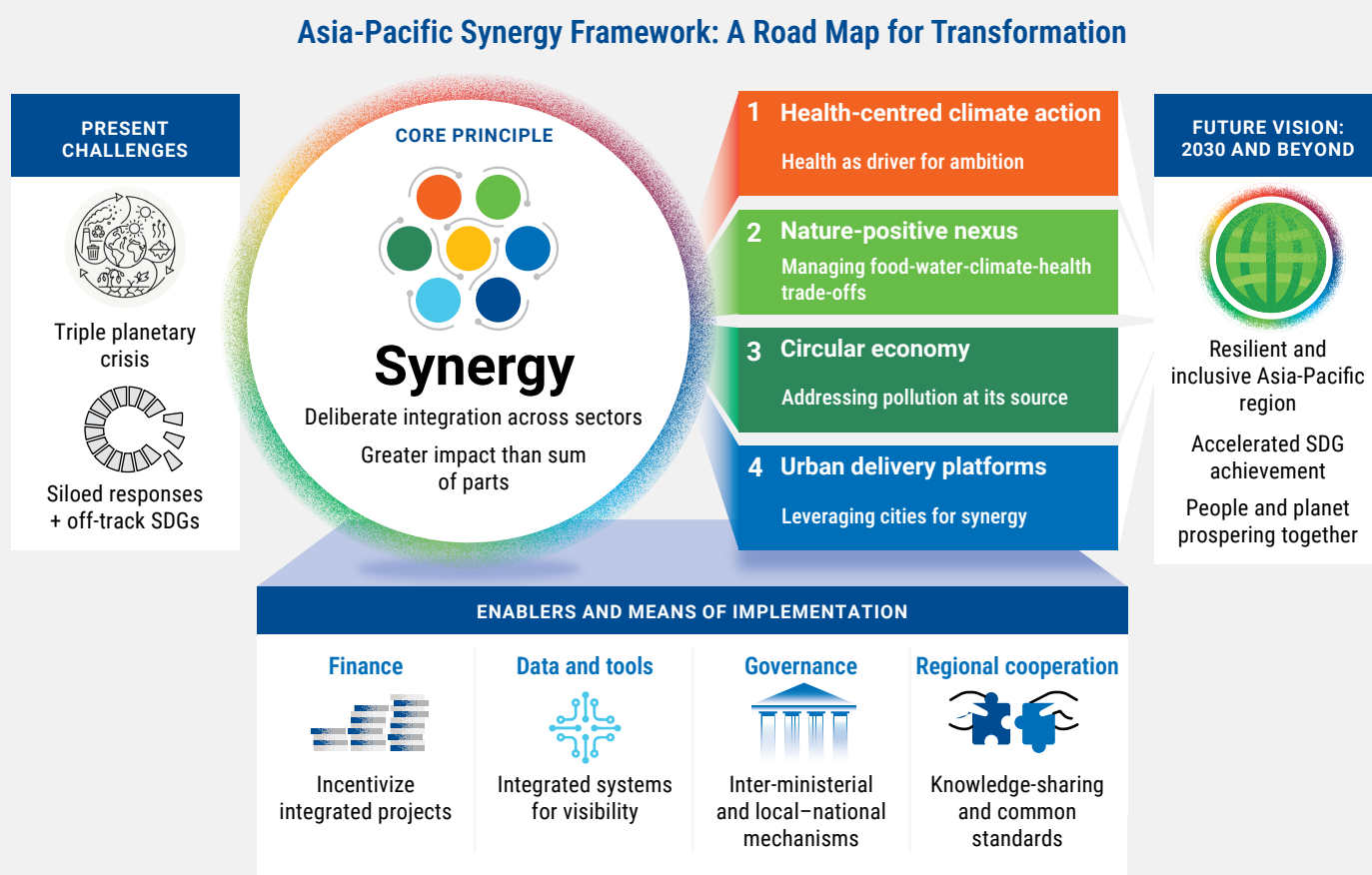
The primary audience for this report includes policymakers, practitioners and researchers engaged in environmental and sustainability policy at local, national and regional levels, including those working in multilateral development banks and the private sector across the Asia-Pacific region. This report is therefore not only intended to demonstrate why synergies should occupy a central place in decision-making in the region, but it is also meant to serve as a practical guide to support the design, implementation and scaling of synergy-oriented policies and investments, while contributing to broader regional and global processes that shape the future of sustainable development.

Contributing to these processes is particularly important since key organizations, such as the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), the Asian Development Bank (ADB) and the United Nations Environment Programme

(UNEP), increasingly seek to promote more integrated and synergistic approaches to SDG implementation in the region. By consolidating evidence and lessons from across Asia and the Pacific, this report aims to help these organizations and concerned policymakers contribute to the substance and structure of a post-2030 Sustainable Development Agenda.

In conclusion, synergistic approaches offer a practical and necessary pathway toward a future where human health and well-being, environmental sustainability, and economic competitiveness and resilience are mutually reinforcing. By moving beyond fragmented responses and embedding synergies into policy, planning and investment systems, the Asia-Pacific region can accelerate progress on the SDGs. The experiences, lessons and directions outlined in this report suggest that there is no time to waste in turning interconnected crises into opportunities for transformation.

Figure 1.3 An overview of the structure of the report



Source: IGES and ESCAP.

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CHAPTER 2

Leveraging synergies between climate and health



Key messages

- 1 Climate change is a defining health challenge for policymakers in Asia and the Pacific, and health considerations are key drivers for accelerated climate action.** Using a health lens to frame climate actions makes the triple planetary crisis more tangible and immediate to decision makers, strengthening the case for integrated responses.
- 2 Escalating planetary health risks underscore the growing urgency of integrated climate and health action.** The transgression of planetary boundaries is amplifying systemic health risks across Asia and the Pacific. These interconnected pressures are intensifying exposure to extreme heat, disrupting food and water systems, degrading ecosystems that support health and increasing the likelihood of cascading risks.
- 3 Health framing can accelerate climate action by strengthening feasibility, equity and social acceptance.** Health benefits are immediate, local and widely understood, making them effective entry points for synergistic solutions. Embedding health co-benefits into Nationally Determined Contributions (NDCs) can enhance their political legitimacy, support just transitions and ensure no one is left behind.
- 4 Integrating health considerations into climate policies unlocks high-impact synergies.** Cleaner energy and mobility reduce air pollution-related deaths, climate-smart food systems improve nutrition and resilience, and climate-resilient cities reduce heat and disease risks, opening pathways for climate-compatible development.
- 5 Realizing climate-health synergies requires governance arrangements and coordinated actions that work across sectors and levels.** Effective delivery depends on whole-of-government approaches that align energy, food, urban, environment and health systems, and empower subnational actors where many health impacts are felt most acutely.
- 6 Regional cooperation and development partners are critical for scaling climate-health synergies.** Transboundary risks and capacity gaps call for regional cooperation on data, knowledge exchange and technology transfer. Development partners can play a catalytic role by aligning climate, health and development finance, supporting integrated monitoring frameworks, and helping countries mainstream climate-health synergies into planning processes.

2.1 Introduction to climate and health synergies

From a planetary-health perspective, the transgression of planetary boundaries through climate change, biodiversity loss and pollution is shrinking the safe operating space for humanity. The degradation of air, water, soil and ecosystems undermines nutrition, disease control and resilience. The planetary-health framing therefore highlights the need for integrated action across land, sea and atmosphere, emphasizing environmental integrity as a determinant of health security and sustainable prosperity.

Climate change poses increasing and accelerating challenges to human health in the Asia-Pacific region. *The Sixth Assessment Report* of the Intergovernmental Panel on Climate Change (IPCC AR6) concludes that global surface temperature for 2011–2020 was 1.09°C higher than 1850–1900 (IPCC, 2021). Global near-surface temperatures reached new heights in 2024, temporarily exceeding 1.5°C above the pre-industrial era (figure 2.1) (Copernicus Climate Change Service, 2025). In 2024, the global mean sea levels reached a record high in the satellite observation record. Between 2015–2024, sea

levels rose at an annual rate of 4.7 mm compared to the 2.1 mm rise per year during 1993–2002 (WMO, 2025). The past decade has been the hottest on record, marked by more frequent and intense heat extremes, shifting monsoon patterns and compounding environmental stress. These dynamics expose the region's dense population and ecosystems to multiple, intersecting risks, making Asia and the Pacific both highly vulnerable and highly influential in shaping global climate-health outcomes.

The goal of the Paris Agreement is to limit global warming to well below 2°C, with efforts to limit temperature to 1.5°C. While global growth in gross domestic product (GDP) is increasingly decoupled from emissions due to the growing use of clean energy sources, greenhouse gas (GHG) emissions in the Asia-Pacific region continue to rise, accounting for over 60 per cent of the global total (ESCAP, UNEP and UN Women, 2025). These climate change impacts are not evenly distributed: women, children, older persons, informal workers, Indigenous peoples and vulnerable communities face disproportionate risks due to existing social, economic and environmental inequalities (WHO, 2021a; MSSRF, 2025).

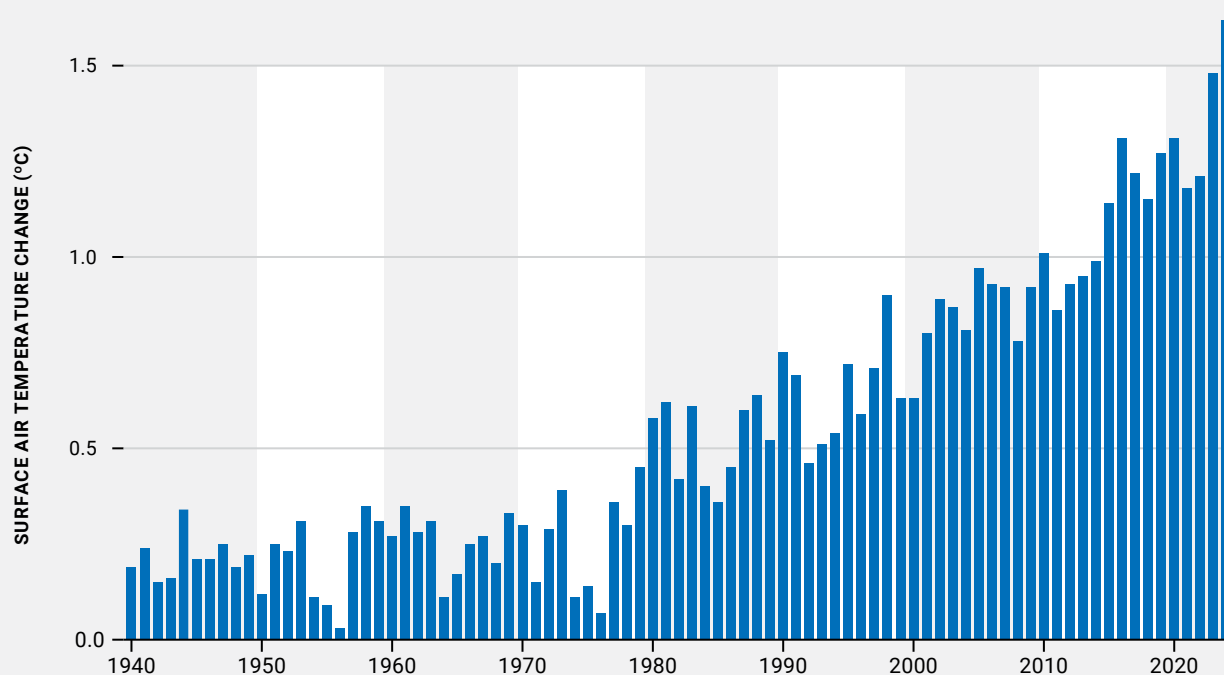
At the same time, Asia and the Pacific is at the centre of the global response to the triple planetary crisis of climate change, biodiversity loss and pollution (ADB, 2024). Rapid urbanization, expanding energy demand and intensive food production have delivered impressive development gains, but often at the expense of environmental integrity and public health. Without a shift towards low emissions, and integrated and resilient development pathways, these interlinked crises threaten to undermine decades of progress on poverty reduction, economic growth and social well-being. In this context, health provides a uniquely powerful lens through which the urgency and complexity of the triple planetary crisis can be understood and addressed.

Importantly, health should be seen as a key driver of climate action. Recent evidence suggests that heat-related mortality and productivity losses are already rising sharply due to record temperatures, with the Asia-Pacific region accounting for nearly 60 per cent of the global increase in heat exposure in recent decades (IPCC, 2022; Romanello and others, 2023; Vicedo-Cabrera and others, 2021; MSSRF, 2025). These trends are already affecting labour capacity and food security, reinforcing the urgency of rapid, health-centred mitigation and adaptation. The IPCC AR6 Working Group II finds that climate change has increased the observed heat-related mortality (medium confidence) and that extreme heat in cities has intensified (high confidence) (IPCC, 2021). Climate-related health risks, including

heat exposure, food insecurity and infectious disease dynamics, are already increasing across regions, with particularly pronounced impacts in Asia and the Pacific (Romanello and others, 2023). Clean air, secure food supplies and healthy ecosystems are tangible benefits that connect global climate goals to everyday lived experience. Framing climate action through health therefore strengthens public support, enhances political feasibility and helps mobilize investment for ambitious mitigation and adaptation measures (Haines and Ebi, 2019). In this regard, health functions as a bridge between environmental ambition and development priorities, translating climate targets into concrete human benefits. Health systems themselves must also adapt to escalating climate risks, including heatwaves, climate-sensitive diseases and extreme weather events, reinforcing the importance of climate-resilient healthcare infrastructure and services across the region. These risks reflect the growing threats from exceeding adaptive capacity thresholds, underscoring the urgency of rapid mitigation and adaptation (IPCC, 2022). At the same time, discussions of overshoot scenarios highlight the importance of rapidly scaling low-cost mitigation options that deliver immediate health co-benefits.

Integrating climate and health also reveals powerful synergies across sectors. Climate action in energy systems such as clean power, sustainable cooling and reduced reliance on fossil fuels can dramatically lower air pollution-related disease burdens while

Figure 2.1 Global annual surface air temperature anomalies (difference from 1850-1900 average)



Source: Copernicus Climate Change Service, "ERA5 global temperature dataset", European Centre for Medium-Range Weather Forecasts (ECMWF), 2025. Available at <https://climate.copernicus.eu/surface-air-temperature-july-2025> (accessed on 05 June 2025).

supporting decarbonization. In food systems, climate-smart and nature-positive agriculture and fisheries improve nutrition, resilience and livelihoods while reducing emissions and ecosystem degradation. In cities, integrated urban planning, clean mobility and green infrastructure reduce heat stress, improve mental and physical health, and enhance resilience to climate hazards. These approaches demonstrate that climate-health synergies are not marginal considerations, but central pathways for advancing multiple Sustainable Development Goals (SDGs) simultaneously, notably SDGs 2, 3, 5, 7, 11, 13, 14 and 15.

Recent international developments, including the first Global Stocktake (GST) under the Paris Agreement, recognize the growing importance of climate-health integration. For instance, the Global Mutirão decision, adopted at the 30th Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC COP30) in Belém, Brazil (10–21 November 2025), has acknowledged the economic and social benefits, and opportunities of climate action, including improved public health. Further, initiatives such as the Belém Health Action Plan have underlined the need for the health sector to adapt to climate change, the development of health adaptation indicators, the launch of a significant philanthropic funding coalition and the disproportionate health impacts of climate change on women and girls. In another indication of growing support for synergies, the Belém Gender Action Plan suggests that integrating gender considerations into climate action can ensure that such actions also benefit women's health and reduce their vulnerabilities. At the regional level, initiatives such as the ASEAN-Japan cooperation on the preparation of an ASEAN-Japan GST report aim to highlight practical pathways that align decarbonization, economic growth and human well-being in preparation for the second GST, and reflect those pathways in COP negotiations.

Despite growing recognition of these linkages, climate and health policies remain largely fragmented. Key challenges include institutional silos between environment, energy, agriculture, urban development and health ministries that limit the ability to design and implement integrated solutions. In addition, health co-benefits are often poorly captured in climate monitoring and reporting frameworks, reducing their visibility in decision-making and investment processes. Further, local and subnational governments frequently lack the mandate and/or finance to act effectively. Bridging these gaps requires strengthened institutional coordination, enhanced data integration and sustained investment in local capacity (see also Chapters 6, 7 and 8 for similar concerns).

Against this backdrop, this chapter examines how climate and health synergies can be operationalized in Asia and the Pacific. It focuses on synergistic approaches related to energy, food and urban systems, with cross-cutting attention to climate-resilient health systems and healthcare facilities.

2.2 Synergistic approaches

Health provides a practical entry point for translating climate ambition into synergistic, equitable and politically feasible action across sectors. For instance, air pollution from fossil-fuel combustion contributes to millions of premature deaths each year, with recent global assessments estimating around 8–9 million deaths annually linked to air pollution exposure (Health Effects Institute, 2025; Lelieveld and others, 2019). At the same time, more than 90 per cent of the global population is estimated to breathe air that exceeds the air-quality guideline levels established by the World Health Organization, highlighting the scale of health risks associated with fossil-fuel combustion and environmental pollution (WHO, 2021a). These risks interact across systems, including food production, water availability and urban environments, and increasingly converge on vulnerable populations such as women, children, informal workers and small-scale producers. Addressing these interconnected risks requires a systems approach linking mitigation, adaptation and health outcomes. This chapter therefore examines how several climate-health synergies approaches can be operationalized, beginning with energy systems.

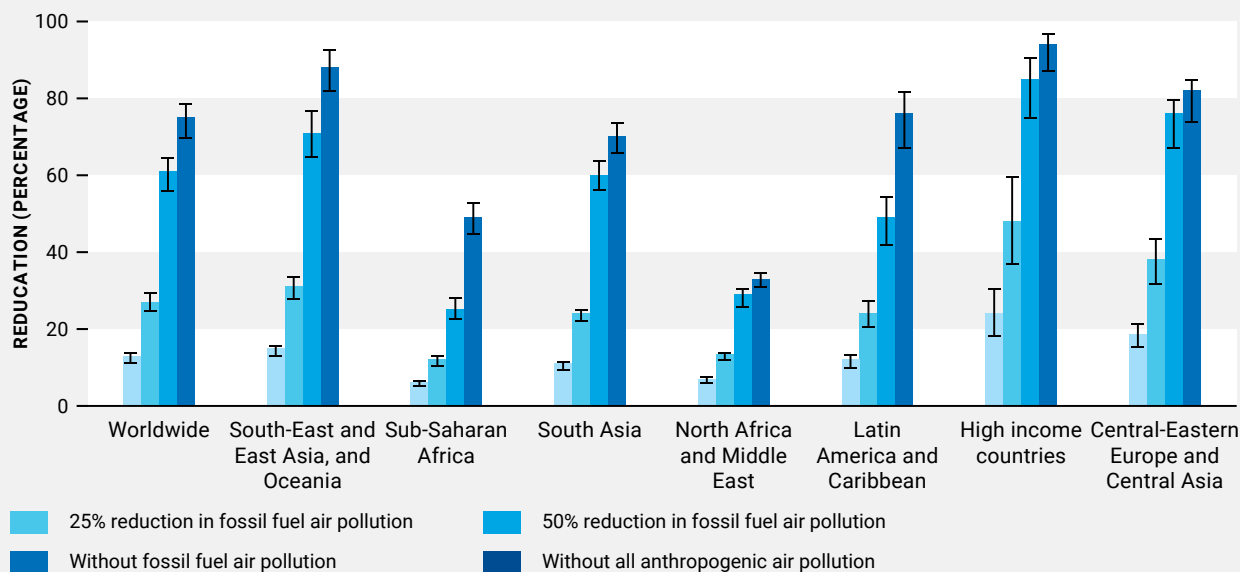
Synergistic climate actions in energy systems

Energy systems are central to climate mitigation, adaptation and public health in Asia and the Pacific, particularly through their influence on air quality, thermal comfort and access to essential services. Continued reliance on fossil fuels has contributed to high GHG emissions and severe air pollution, while rising temperatures are rapidly increasing demand for cooling. Integrated climate action in energy systems therefore represents an immediate opportunity to reduce emissions while delivering tangible health benefits.

From a climate-health perspective, energy systems shape health outcomes through several entry points, including 1) avoiding pollutant emissions by providing energy services more efficiently or in a way that does not involve fuel combustion; 2) reducing pollution abatement costs through technological innovation; and 3) lowering pollutant emissions via stringent emission standards, fuel switching and regulation of fuel quality. Existing policies and proven technologies provide a suite of measures that can be tailored to different national and regional settings as reflected in the case study in India in section 2.3.

Transitioning to clean energy reduces exposure to harmful air pollutants that drive respiratory and cardiovascular diseases. Research indicates that shifting away from fossil fuels could prevent approximately 5.13 million (ranging between 3.63–6.32 million) premature deaths globally each year. Because the relationship between emission cuts and health outcomes is relatively linear, as figure 2.2 indicates, even incremental decreases in fossil fuel reliance, rather than an immediate total cessation,

Figure 2.2 Reduction in annual air pollution-related deaths from eliminating fossil fuel and anthropogenic PM_{2.5} and O₃ emissions



Source: J. Lelieveld, and others, "Air pollution attributable to fossil fuel use: a global estimate of mitigation potential", *BMJ*, vol. 383 (November 2023). Available at <https://www.bmj.com/content/383/bmj-2023-077784>

Note: The regional breakdown in this figure may not correspond with the groupings used by the United Nations.

can lead to a significant drop in mortality rates across all pollution levels (Lelieveld and others, 2023). In addition, reliable and efficient electricity access supports health services, safe housing and productive livelihoods. When health considerations are embedded into energy planning, mitigation and adaptation objectives become more closely aligned with social priorities and equity.

A particularly important dimension of health-driven energy action is the growing demand for cooling in a warming climate. Unmanaged expansion of conventional air-conditioning risks locking in higher emissions and exacerbating energy poverty, while inadequate access to cooling increases heat-related illness and mortality. Sustainable cooling approaches such as combining energy efficiency, appropriate technologies and demand-side management seek to address these risks by treating access to safe and efficient cooling as both a climate and public health priority (SEforAll, 2020).

Integrated energy approaches also generate broader development synergies. Improved air quality lowers healthcare costs and productivity losses, while energy efficiency and demand-side measures reduce pressure on power systems and support affordable access for low-income households. These co-benefits strengthen the case for coordinated policy design across energy, environment, health and urban sectors.

Synergistic climate actions in food systems

Climate impacts such as rising temperatures, water stress, extreme weather events and ecosystem degradation threaten agricultural productivity, food security and nutrition, while food production itself contributes to GHG emissions and environmental pressures. Synergistic climate action in food systems is therefore essential for addressing both planetary and human health challenges in the region.

From a climate-health perspective, food systems shape health outcomes through multiple pathways, including nutrition, livelihoods, occupational safety and environmental quality. Integrated food system approaches, such as combining agricultural production with renewable energy (e.g. agrivoltaics), improving water and land management practices, and enhancing occupational health conditions for farmers, seek to align mitigation and adaptation objectives with improved dietary quality, resilient livelihoods and reduced health risks for rural communities. When health considerations are embedded into food and agriculture policies, climate action moves beyond yield protection to support broader well-being and resilience (see discussion in Chapter 3 on living in harmony with nature).

Practices that reduce emissions or resource use such as water-efficient cultivation methods, diversified cropping systems and soil management, and integrated

food-energy solutions can strengthen resilience and livelihoods if designed appropriately, but may also introduce new risks if local contexts and capacities are not adequately considered. Addressing these trade-offs requires coordinated governance across agriculture, energy, environment and health institutions, as well as meaningful engagement with farmers and local communities, often referred to as nexus governance in Chapter 3.

This approach is illustrated by cases for the Philippines, ASEAN and Japan (discussed in section 2.3), including agrivoltaic systems that combine agricultural production with renewable energy generation. These approaches, then, demonstrate how food system interventions, that explicitly consider health co-benefits such as cleaning air, reducing heat stress for agricultural workers and stabilizing incomes for farming households, can overcome perceived trade-offs between food security, climate mitigation and rural development.

Synergistic climate actions in cities and urban planning

Cities are both major drivers of climate change and spaces for implementing climate solutions while remaining focal points of climate-related health risks in Asia and the Pacific. Rapid urbanization has intensified exposure to air pollution, heat stress, flooding and inadequate living conditions, particularly for low-income and informal communities. In many parts of South and South-East Asia, these urban air quality challenges are further compounded by transboundary haze and wildfire smoke (Kopplitz and others, 2016), which are increasingly recognized as major sources of fine particulate matter and associated health risks, including respiratory and cardiovascular diseases (Gould and others, 2024; Zhang and others, 2025) (see also Chapter 5).

Urban systems offer unique opportunities for health-driven climate action because interventions in transport, buildings, land use and green infrastructure directly shape daily living environments. Clean and accessible mobility reduces air pollution and promotes physical activity; climate-responsive buildings, including passive cooling, heat-resilient design and sustainable cooling, together with improved urban design, protect populations during heatwaves, while urban green and blue infrastructure lowers temperatures, improves mental well-being and reduces disaster risk. Examples such as the rapid uptake of electric two-wheelers in China, Viet Nam and other countries illustrate how low-cost decarbonization options can simultaneously reduce emissions, improve air quality and deliver immediate health benefits supported by national incentives, local transport policies and expanding private-sector markets. When designed holistically, these measures transform cities into platforms for delivering simultaneous mitigation, adaptation and health benefits (see Chapter 5).

Health-centred urban climate action also reinforces equity and inclusion. Many climate-related health impacts are concentrated at the neighbourhood level, making local governments and communities essential actors in implementation. Integrating health objectives into urban planning strengthens social acceptance of climate policies and ensures that benefits reach vulnerable groups, while contributing to SDGs on Good Health and Well-Being (SDG 2), Sustainable Cities and Communities (SDG 11), and Reduced Inequalities (SDG 10), and Climate Action (SDG 13) and Reduced Inequalities (SDG 10). The urban cases discussed in section 2.3 as well as in Chapter 5, including initiatives on sustainable cooling, clean transport and climate-resilient urban design, illustrate this potential in practice.

Cities are both major drivers of climate change and spaces for implementing climate solutions while remaining focal points of climate-related health risks in Asia and the Pacific.

2.3 Case studies

This section presents selected case studies that illustrate how the key approaches outlined in section 2.2 have been operationalized in Asia and the Pacific. Rather than providing an exhaustive overview of many initiatives, the selected cases demonstrate how climate-health synergies can be realized by overcoming common institutional, financial and technical barriers. The case studies also provide practical evidence relevant to ongoing international climate discussions under the Paris Agreement. In the context of the previously mentioned GST, such experiences help illustrate how integrated approaches can simultaneously advance climate mitigation, public health protection and sustainable development. By highlighting practical pathways in sectors such as energy systems, food systems and urban environments, the cases demonstrate how countries can operationalize climate-health synergies in ways that align decarbonization with economic resilience and human well-being. Regional initiatives, including ASEAN-Japan cooperation aimed at contributing insights and evidence to the GST process, further underline the value of documenting and sharing such implementation experiences. As such, the following cases correspond to one of the three key approaches: energy systems, food systems and cities, and illustrates how health considerations can drive integrated climate action.

Table 2.1 Summary of the case studies

Areas of synergies	Synergistic solutions/approaches	Key actors	Enablers
Case study: Heat-resilient urban cooling and heat action plans in India SDGs: 3 7 11 13			
• Heat stress • Energy demand • Climate resilience • Public health protection	• Integrated heat action plans combining early-warning systems • Public health preparedness • Sustainable cooling strategies and energy-efficient cooling technologies	• National and local governments • Public health authorities • Energy and cooling technology sectors • Urban planners and research institutions	• National policy frameworks on cooling and climate resilience, integration of health and climate data • Early-warning systems • Cross-sector coordination between health, energy and urban planning institutions
Case study: Agrivoltaics for climate-health synergies in food systems in the Philippines SDGs: 2 3 7 8 13 15			
• Food security • Renewable energy generation • Climate resilience • Farmer livelihoods and occupational heat exposure	• Deployment of agrivoltaics systems combining solar photovoltaic generation with agricultural production	• Farmers and agricultural cooperatives • Renewable energy developers • Local governments and agricultural authorities • Research institutions and development partners	• Policies supporting dual land use for agriculture and renewable energy • Technical design adapted to crops and farming practices • Access to financing for distributed solar systems • Farmer engagement and agricultural extension services
Case study: Health-oriented urban mobility transition through electric two-wheelers in China and South-East Asia SDGs: 3 7 11 13			
• Urban air pollution • Climate mitigation • Mobility access • Public health	• Deployment of electric two-wheelers and other low-emission mobility solutions integrated with urban transport policies to reduce air pollution and GHG emissions	• Electric mobility manufacturers • Transport authorities • Private mobility providers	• Technological innovation in electric mobility • Supportive urban transport policies • Expanding regional markets for low-emission mobility solutions

Heat-resilient urban cooling and heat action plans in India

In India, rising temperatures and more frequent heatwaves have become a major public health concern. Heat stress disproportionately affects older persons, outdoor and industrial workers, women and low-income households, while rapidly increasing demand for cooling and placing increasing pressure on electricity systems that remain partly reliant on fossil fuels (IEA, 2021). Conventional expansion of air conditioning risks locking in higher emissions, worsening air pollution and exacerbating energy poverty if not managed carefully. While the policies to help manage these issues are often national in scope, implementation has progressed primarily through programmes and pilot initiatives in several states and urban regions, reflecting the diversity of climate risks, electricity systems and cooling demand across the country.

In response to rising temperature and extreme heat, India has advanced sustainable cooling initiatives, including programmes implemented through Energy Efficiency Services Limited and supported by the India Cooling Action Plan, with implementation taking place through programmes and pilot initiatives across several states and cities (IEA, 2021). These initiatives integrate health objectives into energy efficiency, cooling technology deployment and system planning. Rather than treating cooling solely as a demand-side energy issue, these approaches frame access to safe and efficient cooling as a public health priority linked to climate mitigation and adaptation goals. Several of these initiatives have been implemented through large-scale market programmes led by the Energy Efficiency Services Limited, which use bulk procurement mechanisms to accelerate the diffusion of super-efficient air conditioners and reduce costs for consumers (IEA, 2021).

Measures include the promotion of high-efficiency cooling appliances, improvements in building energy performance and demand-side management approaches that reduce peak electricity loads during extreme heat events. These initiatives are supported by policy frameworks that align heat-risk management, energy planning and climate strategies. Framing cooling as a health and safety issue strengthened political support and facilitated coordination across energy, urban, labour and social sectors. These efforts have not been limited to India. In China, for instance, linking demand for energy-efficient cooling led to the formation of partnerships that sparked progress on the Montreal Protocol and Paris Agreement (see Box 2.1).

Key enabling factors included strong national policy direction, innovative financing mechanisms that reduced upfront costs for efficient technologies and the use of data linking heat exposure to health risks to prioritize vulnerable populations and public facilities. This case, then, demonstrates how sustainable cooling can serve as a cornerstone of health-driven energy transitions, offering transferable lessons for scaling demand-side climate solutions in other heat-exposed contexts.

Agrivoltaics for climate-health synergies in food systems in the Philippines

In Asia, food systems are increasingly exposed to climate-related risks, including rising temperatures, extreme weather events and ecosystem degradation. These pressures threaten agricultural productivity, farmer livelihoods and food security, while also increasing health risks for agricultural workers through

prolonged heat exposure. At the same time, efforts to expand renewable energy generation have raised concerns about competition for agricultural land.

Agrivoltaics, also referred to as solar sharing, have emerged in various parts of Asia as an integrated approach that combines agricultural production with solar power generation on the same land. By installing elevated or appropriately spaced photovoltaic panels above crops or pasture, agrivoltaics systems enable continued food production while generating clean electricity and providing partial shading.

These initiatives are designed to support climate mitigation and adaptation while maintaining or improving agricultural productivity under accelerating climate change. The systems are adapted to local crops, climatic conditions and farming practices, and could be combined with irrigation efficiency measures and basic monitoring technologies to optimize both agricultural and energy outputs (Arino and others, 2025). Recent regional assessments suggest that agrivoltaics deployment could unlock significant dual land-use potential across South-East Asia while supporting climate mitigation and agricultural resilience (Johnson and others, 2024; Asia Engine for Net Zero, 2025).

Health considerations play an important role in agrivoltaics deployment. Partial shading can reduce ambient temperatures and heat exposure for farmers, lowering the risk of heat stress and improving working conditions during peak heat periods. More stable incomes from diversified revenue streams also contribute indirectly to improved household nutrition, access to healthcare and overall well-being. Linking climate

Box 2.1 The commercialization of room air conditioners using green and low-carbon refrigerant R290 in China

China, accounting for 80 per cent of the global production of room air conditioners, has pioneered the adoption of ozone- and climate-friendly propane (R290) to phase out HCFC-22, prioritizing long-term industry interests and green development. Through a decade of joint efforts by government departments, the United Nations Industrial Development Organization, the China Household Electrical Appliances Association and related enterprises, industries in China have conducted extensive research and marketization, and successfully transformed over 20 production lines for R290 room air conditioners. This collaboration also promoted revisions to international standards, developed and implemented domestic flammable refrigerant standards, and established national training centres for installation and maintenance.

R290 is an abundant, natural, cost-effective refrigerant with a negligible global warming potential, significantly outperforming alternatives. While its flammability increases production costs, small-scale sales have already exceeded 10 million units through the industry's years of marketization and pilot programmes for R290 refrigerant applications.

Enabling factors in this case included meticulous state planning, the leveraging role of the Multilateral Fund of the Montreal Protocol, and long-term commitment and upstream-downstream collaboration by key industries, and alternative technology choices aligned with sustainable development. Stable international and domestic funding, clear policy guidance, and coordinated institutional actions were also critical to this success.

Source: Submitted by the Ministry of Ecology and Environment, China.

action with tangible health and livelihood benefits has strengthened acceptance among farmers and local communities.

Successful agrivoltaics initiatives depend on enabling policies that recognize environmental protection, dual land use, coordination between agriculture and energy authorities, and access to finance for smallholders. Farmer engagement and extension support can also be critical to ensuring that systems are designed around agricultural needs rather than energy generation alone. This case, then, illustrates how agrivoltaics can address perceived trade-offs between food security, climate mitigation and health, offering lessons for scaling integrated food-energy systems across diverse agroecological and socioeconomic contexts.

Health-oriented urban mobility transition through electric two-wheelers in China and South-East Asia

Across cities in Asia and the Pacific, climate change is intensifying health risks associated with air pollution, extreme heat, flooding and inadequate housing. Rapid urbanization has increased exposure to these hazards, particularly and disproportionately in low-income and informal neighbourhoods where access to cooling, clean transport and basic services is limited. As a result, urban residents, especially older persons, children and outdoor and informal workers, face growing risks of respiratory illness, heat stress and climate-related morbidity (WHO, 2021b; MSSRF, 2025).

Urban climate initiatives that integrate health considerations focus on improving daily living environments through coordinated action across transport, buildings, land use and urban infrastructure. In this context, the rapid deployment of electric two-wheelers has emerged as an entry point for clean and accessible mobility, particularly in cities in Asia where motorcycles make up a large share of the vehicle fleet. To illustrate, China has largely electrified its two-wheeler fleet, with electric scooters and e-bikes dominating urban mobility and accounting for the vast majority of the world's electric two- and three-wheelers (IEA, 2025). Viet Nam, to cite another example, is one of the world's fastest-growing electric two-wheeler markets, but electric models still represent only a relatively small share of the country's overall motorcycle fleet despite strong growth in sales and domestic production (Le, Posada and Yang, 2022). Efforts to promote electric vehicles are often supported by complementary measures such as climate-responsive buildings, sustainable cooling, and green and blue infrastructure. Rather than treating these interventions as isolated sectoral actions, integrated urban approaches align mitigation, adaptation and health objectives within urban planning and service delivery frameworks. This enables cities to address multiple climate and health risks simultaneously while supporting broader development goals.

Health impacts, particularly respiratory illness linked to air pollution and heat-related illness during extreme temperature events, have frequently acted as catalysts for urban climate action. In cities where two-wheelers are a dominant source of emissions, electrification has been prioritized as a rapid and scalable solution to reduce exposure to air pollutants such as fine particulates, thereby lowering health risks. Public concern over deteriorating air quality and rising heat risks has strengthened political mandates for intervention and supported coordination across transport, environment and health sectors.

Key enabling factors included strong local leadership, supportive transport electrification policies and private sector innovation in electric mobility. The use of data linking air pollution exposure with health outcomes helped prioritize interventions such as electric two-wheelers in high-impact urban segments. This case also demonstrates how targeted electrification of dominant transport modes can deliver rapid climate and health benefits while remaining scalable across diverse urban contexts.

2.4 Enablers for scaling and replication

Across the three cases described in section 2.3, health framing helped mobilize political support and investment by making climate benefits more visible, including through targeted interventions such as electric two-wheelers in urban transport systems. Cross-sectoral governance and coordination were critical to aligning energy, food, urban and health objectives, while access to finance and data supported prioritization and scaling. At the same time, the cases highlight persistent challenges, including institutional silos, local capacity constraints and the need to manage trade-offs related to land use, energy demand and equity. These cross-case insights show that scaling climate-health synergies requires integrated action beyond technical solutions alone. Scaling requires enabling conditions that allow integrated approaches to be designed, financed and sustained across sectors and levels of governance (see also Chapters 6, 7, and 8). This section identifies key enablers that support health-driven climate action in energy systems, food systems and cities, and that can inform broader replication across Asia and the Pacific.

Finance and investment aligned with co-benefits

Scaling climate-health synergies requires financing models that recognize and reward co-benefits beyond emission reductions alone. Many integrated interventions such as sustainable cooling, agrivoltaics and climate-resilient urban infrastructure face higher upfront costs or complex risk profiles, even though they deliver substantial long-term benefits for health, resilience and productivity. These benefits also

generate macroeconomic gains through reduced health expenditures, improved labour productivity and stronger social resilience.

The cases highlight the importance of innovative financing mechanisms, including blended finance, concessional lending and results-based approaches, to reduce upfront barriers and advance crowding-in private investment (see also Chapter 6). Clear policy signals, technical standards and risk-sharing mechanisms are also essential to attract private companies and institutional investors, enabling the scaling of solutions such as sustainable cooling, agrivoltaics and health-centred climate-resilient urban infrastructure. International cooperation mechanisms under the Paris Agreement, including Article 6 approaches, offer additional opportunities to mobilize finance and technology while supporting host country priorities. To be effective, these mechanisms need to incorporate safeguards and metrics that capture health benefits, equity and sustainable development outcomes alongside emissions reduction and resilience-building.

Data, evidence and integrated metrics

Access to data linking climate risks with health outcomes is critical for prioritizing interventions, mobilizing resources and tracking progress. Across the cases examined, evidence on heat exposure, air pollution, occupational health risks and nutrition played an important role in shaping policy decisions and investment choices. However, climate, environmental and health data systems often remain fragmented, limiting their use for integrated decision-making.

Strengthening integrated data platforms and metrics that capture both emission reductions and health outcomes can significantly improve policy design and accountability. Indicators such as avoided mortality and morbidity, reduced heat exposure, or improved nutrition can help make the benefits of climate action visible and actionable, including through the integration of health co-benefit quantification into climate project appraisal and cost-benefit analysis. Examples include heat vulnerability mapping, linking satellite-based exposure data with socioeconomic indicators and integrating health surveillance data with temperature and air-quality monitoring to support anticipatory planning and targeted interventions (see Chapter 7).

Integrated and cross-sectoral governance

A fundamental enabler of climate-health synergies is governance that breaks down institutional silos between climate, energy, agriculture, urban development and health sectors. In many countries, responsibilities for mitigation, adaptation and health protection are distributed across multiple ministries and agencies, limiting coordination and coherence. The cases in this chapter show that integrated governance arrangements

such as inter-ministerial coordination mechanisms, joint planning processes and shared targets are essential for aligning policy objectives and implementation pathways (see Chapter 8).

Health considerations can serve as a unifying entry point for such coordination. Strengthening climate-resilient health systems, including hospitals, public health surveillance and emergency response capacities, will also be essential to manage escalating climate-related health risks. By framing climate action around health protection and well-being, governments can create common incentives for collaboration across traditionally separate sectors. This is particularly important in the Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) and the Long-Term Low Emission Development Strategies (LT-LEDS), a practice that is becoming increasingly common in Asia and the Pacific (see Box 2.2). Clear mandates that link climate strategies with health outcomes, including heat-risk management, air quality improvement, and food and nutrition security, help translate high-level ambition into coordinated action on the ground.

Strengthening climate-resilient health systems, including hospitals, public health surveillance and emergency response capacities, will also be essential to manage escalating climate-related health risks

Capacity, local implementation and stakeholder engagement

Many climate-health synergies are realized at the local level, where exposure to climate risks and health impacts is most acute. Local governments, farmers, communities, and small- and medium-sized enterprises play a central role in implementation, yet often face capacity constraints related to technical expertise, institutional authority and access to finance.

Building local capacity and ensuring meaningful stakeholder engagement are therefore critical enablers. Extension services, technical assistance and participatory planning processes help tailor solutions to local contexts and increase acceptance among affected communities. In the cases examined, early engagement with consumers, farmers, workers and urban residents supported the design of interventions that addressed real health and livelihood concerns, strengthening sustainability and scalability.

Box 2.2 Health and Nationally Determined Contributions in Asia and the Pacific

In the Asia-Pacific region, 32 out of 36 NDCs 3.0 (as of 10 April 2026) highlight the importance of addressing climate-related risks to human health, particularly risks associated with heat waves, diseases and air pollution. This underscores the importance of strengthening the resilience of health systems, health infrastructure and health facilities to climate change. However, a limited number of countries in the Asia-Pacific region explicitly highlight equitable access to care and climate justice considerations, particularly for vulnerable populations including women, children, coastal communities and low-income groups. Health is one of the key adaptive sectors in almost all the 26 NAPs submitted by countries in the Asia-Pacific region. Similarly, almost all countries have embedded health into their LT-LEDS emphasizing it as an opportunity to reshape the economy and society into low-carbon and resilient societies, and reap significant environmental, economic and health co-benefits. In addition, the Belém Health Action Plan provides a framework to advance the COP30 Action Agenda, particularly key objective 16 on promoting resilient health systems to support collective progress towards the 2028 GST. Japan, Malaysia and Tuvalu are among the three supporting countries from the Asia-Pacific region.

Equity, inclusion and health as a driver of just transitions

Equity and inclusion are central to the success of climate-health synergies. Health impacts of climate change are often unevenly distributed, with vulnerable populations facing the greatest risks while having the least capacity to respond. Integrating equity and gender considerations into climate-health interventions helps ensure that benefits reach those most in need and supports just transitions.

Positioning health as a driver of climate action reinforces this focus on equity. Health framing highlights distributional impacts and makes visible the social dimensions of climate policies, from access to cooling and clean energy to safe working conditions and food security. Embedding equity-focused indicators and safeguards into policy design, finance and monitoring frameworks strengthens the legitimacy and durability of integrated climate-health action.

Regional cooperation and knowledge-sharing

Regional cooperation plays a catalytic role in enabling climate-health synergies across Asia and the Pacific. Many climate and health risks such as heatwaves, air pollution, food system disruptions and climate-sensitive diseases transcend national boundaries. Regional platforms can support peer learning, harmonization of approaches, and the sharing of data, technologies and good practices. By fostering collaboration and mutual learning, regional cooperation helps accelerate the diffusion of health-driven climate solutions and supports countries at different stages of development. For instance, Central Asia is developing an important foundation for regional climate and health cooperation through WHO/Europe's Roadmap for Health and Well-being in Central Asia (2022–2025). This framework provides a basis for coordinated action on climate-resilient health systems, transboundary environmental risks and adaptation planning.

2.5 Key insights and recommended actions

Building on the approaches, case studies and discussion of enablers, this section outlines practical recommendations to mainstream climate-health synergies into climate action and sustainable development in Asia and the Pacific. The recommendations are structured across three levels: national/local governments, regional cooperation and development partners reflecting the multilevel governance required to scale health-driven climate solutions. To operationalize these recommendations, it is important to recognize the complementary roles of governance levels. Together, these recommendations underscore the importance of positioning health as a driver of climate action across governance levels. By aligning policies, finance and implementation around health outcomes, countries in Asia and the Pacific can accelerate climate ambition, enhance social acceptance and deliver resilient and inclusive development pathways in the face of the triple planetary crisis.

Recommendations for national governments

- Position health and well-being not only as an outcome but as a central driver for ambitious climate mitigation and adaptation targets, supported by stronger public support and investments.
- Integrate health considerations into NDCs, NAPs and LT-LEDS.
- Prioritize the rapid deployment of scalable and low-cost mitigation options that deliver immediate health co-benefits, particularly in areas where climate risks are accelerating and early action can avoid long-term system lock-in.
- Strengthen institutional frameworks for climate action that link climate, health and development priorities and national-subnational-local level implementation

by, for instance, establishing or strengthening institutional mechanisms that align targets, budgets and implementation responsibilities across sectors.

- Embed health, gender and equity indicators into national climate monitoring, reporting, evaluation and learning systems. Integrating these indicators into decision-making frameworks, including national GHG emission inventories and enhanced transparency frameworks, helps ensure that co-benefits reach vulnerable populations.
- Empower subnational governments and local actors to implement integrated solutions by providing them with the mandates, resources and technical support needed to implement health-driven climate action in cities, agricultural areas and communities, including through decentralized finance and capacity-building.

Recommendations for local governments

- Strengthen local leadership to operationalize climate-health action through integrated planning and implementation.
- Embed health considerations into local climate action plans, urban development strategies, and food and energy initiatives, prioritizing measures such as heat-resilient infrastructure, sustainable cooling, clean mobility and nature-based solutions.
- Develop municipal heat action plans, establish local cooling centres, enforce energy-efficient building standards, expand urban greening programmes and procure low-emission or eco-friendly public transport fleets.
- Facilitate participatory planning with communities and local stakeholders to further enhance equity and social acceptance, while collaboration with national authorities and development partners can help mobilize finance, technical assistance and capacity-building, including through mechanisms such as Voluntary Local Reviews and integrated monitoring frameworks.

Recommendations for development partners

- Align climate, health and development finance to support integrated action in blended finance, concessional lending and results-based mechanisms to reduce upfront costs and mobilize private investment for integrated solutions.
- Design financing instruments that recognize and reward climate-health co-benefits, including avoided health costs, improved productivity and resilience gains.
- Support capacity-building and technical assistance for the design, implementation and monitoring of integrated climate-health interventions by providing technical assistance, strengthening data and reporting systems, and supporting pilot projects that demonstrate scalable approaches.
- Leverage international cooperation mechanisms under the Paris Agreement, including Article 6 approaches, to mobilize finance and technology for integrated climate-health solutions.
- Ensure that international cooperation mechanisms incorporate safeguards and indicators that capture health benefits, equity and sustainable development outcomes alongside emission reductions.

Recommendations for regional cooperation

- Support regional responses to shared climate and health risks through, for instance, facilitating joint risk assessments, early warning systems and coordinated responses that enhance collective resilience.
- Strengthen regional platforms for knowledge exchange and peer learning on climate-health synergies, building on existing regional programmes and initiatives, such as the Asia-Pacific Regional Action Programme on Air Pollution, the Asia-Pacific Clean Air Partnership or the Better Air Quality Conferences.
- Promote harmonized approaches to data, metrics, and standards and methodologies for assessing climate-health impacts, enabling comparability and reducing transaction costs.

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Conserving biodiversity through nature-positive pathways



Key messages

- 1 **With nearly half of the world's biodiversity hotspots and megadiverse countries, the Asia-Pacific region is uniquely positioned to lead a global shift toward nature-positive societies.** As many people in Asia and the Pacific, particularly Indigenous peoples and local communities, depend directly on natural systems for their livelihoods, the region offers a valuable testing ground for 'living in harmony with nature'.
- 2 **Localizing a nexus approach is essential to maximizing synergies and minimizing trade-offs between actions in the biodiversity, climate, food, water and health sectors.** A nexus approach should underpin the integrated solutions needed to implement the Kunming-Montreal Global Biodiversity Framework (KMGBF). A nexus approach should also be embedded in National Biodiversity Strategies and Action Plans (NBSAPs) and Local Biodiversity Strategies and Action Plans (LBSAPs), requiring a corresponding shift toward 'nexus governance' that is characterized by transdisciplinary framing and equity-based decision-making.
- 3 **Integrating Indigenous and local knowledge in nature-based solutions (NbS) is critical to opening sustainable future pathways.** In Asia and the Pacific, valuing rich knowledge systems is a prerequisite for the co-design and co-implementation of nature-based solutions (NbS). This necessitates the full and effective participation of Indigenous peoples and local communities as rights-holders as well as the use of tools like the Nature Futures Framework (NFF) to explore future scenarios that balance diverse values of nature.
- 4 **Advancing a nature-positive economy in the Asia-Pacific region requires deepening collaboration between governments and businesses.** Addressing the risks of environmental crises is essential for long-term corporate value and resilience. Strengthening partnerships between governments and businesses and integrating nature into business operations can facilitate the delivery of NbS.
- 5 **Establishing a dedicated regional partnership for NbS is essential to translate local successes into broader national and regional impacts.** This hub would harmonize standards, facilitate data- and knowledge-sharing, technology transfer, enable the cross-border scaling of stewardship models, provide regulatory clarity (needed to attract public and private capital) and strengthen regional finance to accelerate funding for nature-positive infrastructure and resilient ecosystems.

3.1 Introduction to biodiversity and nature-positive synergies

Just as nature is the foundation of life on Earth, biodiversity provides the essential 'ecosystem services' required to sustain that foundation (e.g. food, water, medicines, fuel, water and climate regulation, pollination, aesthetic value, recreation, spirituality, education). Yet, globally that foundation is weakening as at least a million animal and plant species are now threatened with extinction, and many of these threatened species will go extinct within decades without "transformative changes" (IPBES, 2019). In fact, driven by increased human activity, extinction rates are estimated to be between 10 to 100 times higher than the average extinction rates of the past 10 million years. Therefore, a sustainable future for all depends on whether the world works toward goals consistent with nature-positive development such as "halting and reversing nature loss by 2030 on a 2020 baseline and achieving full recovery by 2050" (Locke and others, 2021).

Global efforts to reverse biodiversity loss

There have been several high-profile global efforts to preserve biodiversity for future generations. Entering into force in 1993, the Convention on Biological Diversity (CBD) was among the first global agreements to demonstrate such an effort. The CBD recognizes that the conservation of biodiversity is "a common concern of humankind". It also has three main objectives aligned with this overarching goal: 1) the conservation of biological diversity; 2) the sustainable use of the components of biological diversity; and 3) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. Since the adoption of the CBD, there has been progress and setbacks. Notable advances include the Cartagena Protocol on Biosafety in 2000, and the 2010 agreement over the Strategic Plan for Biodiversity and its 20 Aichi Biodiversity Targets, while setbacks include the fact that none of the 20 Aichi targets have been achieved.

The KMGBF, adopted in 2022, was designed to address the shortcomings of the Aichi Biodiversity Targets. It established 23 ambitious targets for 2030, and a robust monitoring framework centred on 'headline indicators'. To ensure accountability, the framework introduced a standardized reporting process and a global review of progress based on national reports known as the National Biodiversity Strategies and Action Plans (NBSAPs). Parties were requested to align their NBSAPs with the KMGBF and submit updated targets or full plans to the CBD prior to 16th Conference of the Parties (CBD COP16) in October 2024. However, the majority of countries missed this submission deadline, and those that met it have frequently faced significant financial and institutional barriers during implementation. These gaps underscore the need for a shift toward a more nature-positive development pathway.

Such a shift requires understanding the interrelationships between the direct and indirect drivers of biodiversity loss. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) *Global Assessment Report on Biodiversity and Ecosystem Services* (2019) identified the main direct drivers as: 1) changes in land and sea use; 2) direct exploitation of organisms; 3) climate change (see Chapter 2); 4) pollution (see Chapter 4); and 5) invasive alien species. The indirect drivers were: 1) demographic and sociocultural trends; 2) economic and technological factors (see Chapters 6 and 7); 3) institutions and governance (see Chapter 8); and 4) conflicts and epidemics. These drivers, including biodiversity loss, climate change and pollution as well as means of implementation, are closely related. Their interconnections also underscore the importance of a synergistic approach to maximize biodiversity benefits and minimize related trade-offs.

Biodiversity loss in the Asia-Pacific region

Leveraging these connections and limiting related conflicts is particularly important in Asia and the Pacific. The region encompasses diverse ecosystems, climates, geographies and sociocultural settings. It spans from the world's highest mountains to deepest oceans while supporting complex alluvial systems and a dense network of continental and archipelagic island systems. Covering a huge ocean area, the region's marine diversity is as significant as it is striking: 77 per cent (200,000 km²) of the world's coral reefs, 51 per cent (74,808 km²) of the world's mangrove forests and roughly a quarter (149,200 km²) of the world's seagrass meadows are in Asia and the Pacific (ESCAP, 2024). The region also contains 17 of the 36 global biodiversity hotspots and 7 of the 17 megadiverse countries. The impacts of changes in the region's ecosystem are also notable. For example, degradation of biota and ecosystems affects the livelihoods of 50–80 per cent of rural populations, many of whom depend on forest products and fishery resources for their livelihoods (UNEP, 2016; IPBES, 2018).

Despite the rich biodiversity, the region's natural habitats have steadily degraded. This decline is not only apparent in the visible loss of ecosystems, forests, alpine, inland freshwater and wetlands, and coastal ecosystems, but in hard data that demonstrates the magnitude of those losses. Some of that data suggests that South-East Asia experienced a 12.9 per cent reduction in total forest cover between 1990 and 2015 (IPBES, 2018). A similar worrying trend is evident in figures that reveal a 63 per cent global loss in mangrove cover between 1996 and 2020 (ESCAP, 2024). Projections that suggest that up to 90 per cent of coral reefs in South and South-East Asia will be severely degraded by 2050 lay bare the trends that point in the same troubling direction (ESCAP, 2024). These trends are often attributable not only to pollution and climate change but also to coastal development and illegal fishing. The influence of the latter human-induced impacts can be seen in a 28.7 per cent increase in populations residing within 5 km of coral reefs in the Pacific region between 2000 to 2020 (Wicquart and others, 2025).

Ecosystem degradation has also led to unprecedented species losses in Asia and the Pacific. To illustrate, the IUCN Red List identifies nearly 25 per cent of the region's endemic species as threatened. In addition, this number is likely to be larger since 19 per cent of records on species remain "data deficient" (IPBES, 2018). A similar story emerges when tracking trends in the Biodiversity Intactness Index, which is an index that assesses the proportion of original natural biodiversity that persists within a region's terrestrial ecosystem. Trends from that index suggest that the conversion of natural landscapes into high-yield agricultural zones in the Asia-Pacific region has led to a decline of biodiversity over the last 100 years that is more rapid and steep than any other region (WWF, 2024). The effects of this decline also extend to human systems as biodiversity loss and nature's decline also impact health. It is estimated, for instance, that almost one quarter of the global environmental burden of disease originates from 14 South-East and East Asian countries (WHO Western Pacific, 2018).

Many of these trends are due to changing land and sea use. These changes are identified as the primary drivers of biodiversity loss, followed by the direct exploitation of organisms, climate change, pollution and invasive non-native species. Approximately 75 per cent of GDP in Asia and the Pacific is directly or indirectly tied to nature through sectors such as agriculture, fisheries and tourism (ADB, 2025). There are nonetheless some differences across the Asia-Pacific region in the drivers of land-use change. Most notably, larger countries tend to be affected primarily by large-scale agricultural expansion, including cash crop plantations, particularly oil palm, logging and agricultural clearing, while smaller countries, particularly the Pacific small island developing States, face land degradation driven by small-scale activities such as shifting cultivation, urban growth and salinization. This latter set of impacts also include expanding human access to resources through growing road networks that

are leading to quick land-use change (Engert and others, 2024; Stibig and others, 2013; Moad, Whitmore and H. C. Features Submission, 1994).

Despite the endorsement of KMGBF and the updating of NBSAPs, the Asia-Pacific region faces substantial challenges in implementing provisions in these agreements and plans to reverse biodiversity loss. Some of these challenges are related to financial gaps since many countries lack robust biodiversity-finance plans or mechanisms to mobilize private capital (see Chapter 6). They also include limited access to and supplies of data and technologies that undermine evidence-based actions, with many countries reporting insufficient data on ecosystem health, species status and pressures (see Chapter 7). Fragmented governance and institutional arrangements at local, national and regional scales are yet another set of hurdles (see Chapter 8). Finally, the lack of an integrative, inclusive and holistic approach neglects the diverse knowledge systems, particularly the region’s wealth of Indigenous and local knowledge, despite increasing awareness of its value, thereby limiting Indigenous peoples and local communities in decision-making processes.

Nevertheless, not all trends across the Asia-Pacific region are negative. For instance, the region has taken steps to expand biodiverse protected areas, though these steps are insufficient to outweigh habitat loss and pressures on vulnerable ecosystems in much of the region. There is hope that synergistic approaches can support a transformational shift toward the nature-positive societies needed in the Asia-Pacific region and beyond.

3.2 Synergistic approaches

Synergistic approaches are regarded as potentially transformative responses to interrelated biodiversity and other environmental challenges (IPBES, 2024a; 2024b). Their potential reflects the fact that biodiversity is not an isolated environmental issue but the foundation of resilient and inclusive development itself (IPBES, 2024a). This recognition is reinforced by growing evidence that healthy ecosystems are critical to achieving a broad range of Sustainable Development Goals (SDGs): climate resilience, food security, water provision and human health. Finally, the importance of synergies involves considerable thinking on how to operationalize a nexus approach.

A nexus approach as a synergistic solution

A nexus approach can provide the basis for synergistic solutions. The ‘nexus’ in this case refers to the critical interlinkages among two or more elements of biodiversity, water, food, health and climate change. A nexus approach, then, aims to maximize synergies and minimize trade-offs between these key elements, while simultaneously acknowledging just and sustainable futures (IPBES, 2024a). On the other hand, siloed approaches that focus on only one or two elements can have the opposite effect, adversely impacting neglected elements (figure 3.1).

An example from the food sector illustrates how a nexus approach works. If a policymaker in the agricultural sector focuses narrowly on food production at the

Figure 3.1 Projected future impacts of nexus scenario archetypes on nexus elements



Source: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *IPBES Nexus Assessment: Summary for policymakers*, figure 5, Zenodo (2024a).

expense of other issues, the resulting policy outcomes could inadvertently harm biodiversity. However, if policymakers took a nexus approach, the consequent policy decisions are more likely to deliver benefits across multiple sustainability domains. A nexus framing is therefore increasingly important for a growing range of policy concerns. This includes climate adaptation and mitigation where a singular focus on food production can promote industrial agriculture and deforestation that can further destabilize the climate. The need for nexus approach also applies to emerging issues such as pollination since research shows that 35 per cent of the world’s food crops rely on pollination (Klein and others, 2007). Finally, a nexus approach can have vitally important implications for health. An estimated 23 per cent of global deaths and 26 per cent of deaths among children under 5 years of age are attributed to the environment (Prüss-Üstün and others, 2016), and ecosystem disruption increases the risk of zoonotic disease (IPBES, 2020).

Transformative change and the diverse values of nature

A related synergistic approach needed for a nature-positive future focuses on transformative change. This type of change requires “a fundamental, system-wide reorganization across technological, economic and social factors, including paradigms, goals and values” (IPBES, 2019). Such a systemic reordering is needed because many of the underlying causes of biodiversity loss and nature’s decline necessitate deep shifts in how humans conceive of and interact with nature. A shift in these values is also required to address overarching challenges, realign principles and craft strategies to reverse biodiversity losses (table 3.1).

One of the keys to leveraging synergies for transformative change is to squarely address some of the underlying causes and overarching challenges for biodiversity loss in an integrated or synergistic manner. This, in turn, requires recognizing that often current land use and resource extraction, including unsustainable production patterns and governance arrangements, are rooted in socioeconomic systems that often trace back to inequitable colonial eras. During these periods, it was unfortunately common to exclude, neglect or underrepresent Indigenous and local knowledge. To address the underlying causes and related challenges, therefore, some of the principles and strategies in table 3.1 that run counter to that historical legacy should be embedded and localized in different countries and in the region.

In a similar vein, some of the key synergistic strategies needed for transformative change also involve promoting the conservation and restoration of nature while enhancing inclusion of diverse values of nature, especially relational values and participation of Indigenous people and local communities. Recognizing these values can help redirect current growth-centred economic systems toward approaches that value the interdependence between human well-being and environmental sustainability. This is particularly important given the rise in emerging economies and increasing pressures on ecosystems that likely accompany their emergence. A shift towards more inclusive and accountable governance and economic systems at an early stage could help incorporate the perspectives and ideas needed to safeguard against these challenges.

A related synergistic approach that can support transformational changes involves including diverse values of nature into policies and practices. The Inter-

Table 3.1 The underlying causes of biodiversity loss and nature’s decline, and overarching challenges, key principles, strategies and actions for transformative change

Underlying causes	• Disconnect from and domination over nature and people; • Concentration of power and wealth; and • Prioritization of short-term, individual and material gains.
Overarching challenges	• Relations of domination over nature and people, especially those that emerged and were propagated in colonial eras and that have persisted over time; • Economic and political inequalities; • Inadequate policies and unfit institutions; • Unsustainable consumption and production patterns, including individual habits and practices; and • Limited access to clean technologies, and uncoordinated knowledge and innovation systems.
Principles to address the underlying causes	• Equity and justice; • Pluralism and inclusion; • Respectful and reciprocal human-nature relationships; and • Adaptive learning and action.
Strategies	• Conserve and regenerate places of value to nature and people; • Drive systemic change in the sectors most responsible for biodiversity loss and nature’s decline; • Transform economic systems for nature and equity; • Transform governance systems to be integrative, inclusive, accountable and adaptive; and • Shift societal views and values to recognize human-nature interconnectedness.

Source: Adapted from Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *IPBES Transformative Change Assessment: Summary for policymakers*, Zenodo (2024b).

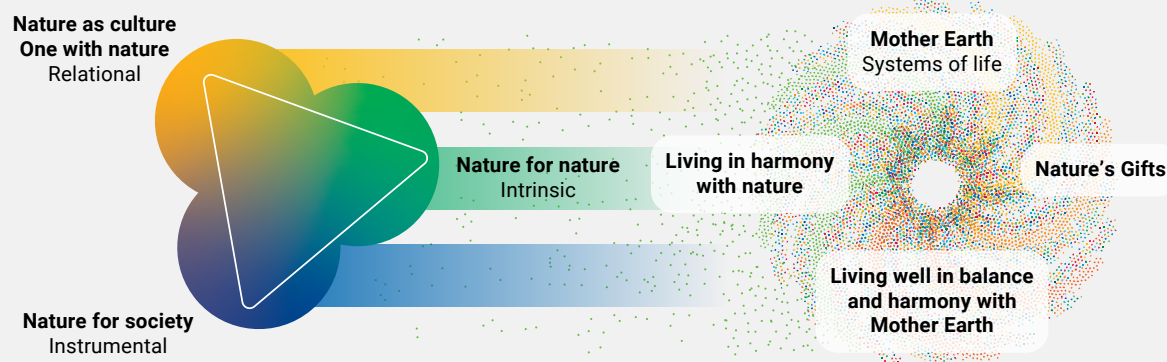
governmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) emphasizes understanding the effects of three values on people and nature that can support transformative change: “*instrumental values* (i.e., means to a desired end often associated with the notion of “ecosystem services”), *relational values* (i.e., the meaningfulness of human-nature interactions), and *intrinsic values* (i.e., independent of people as valuers)” (IPBES, 2022). The Nature Futures Framework (NFF) provides a comprehensive approach to integrating these diverse values. The NFF is particularly important since

it emphasizes relational values that have often been neglected in the era where short-term, individual and material gains eclipse more sustainable values held by Indigenous peoples and local communities. These long-held values, in particular, are premised on strengthening the interconnectedness between humans and nature, and on living in harmony with nature (Box 3.1). Enhancing relational values enables a shift from domination to care; a shift that is fundamentally about recognizing synergies between humans and ecosystems which can provide a pathway to nature-positive outcomes.

Box 3.1 The Nature Futures Framework and relational philosophies in Asia and the Pacific

The NFF is a flexible tool for exploring future scenarios and models of desirable futures for people, nature and Earth. It consists of three representative values (intrinsic value, instrumental value and relational value) related to humans and nature.^a Each vertex of the triangle in figure 3.2 represents one of the following three perspectives on the relationship between humans and nature. In the “nature for nature” perspective, people view nature as having an intrinsic value, and that value is placed on the diversity of species, habitats, ecosystems and processes that form the natural world, and on nature’s ability to function autonomously. The “nature as culture”/“one with nature” perspective highlights relational values of nature, where societies, cultures, traditions and faiths are intertwined with nature in shaping diverse biocultural landscapes. The perspective of “nature for society” emphasizes the utilitarian benefits and instrumental values that nature brings to people and society.

Figure 3.2 The Nature Futures Framework triangle



Source: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *The Nature Futures Framework a flexible tool to support the development of scenarios and models of desirable futures for people, nature and Mother Earth, and its methodological guidance*, Zenodo (2023).

The NFF is not only for scenario-building; it is also consistent with many existing Indigenous relational practices. For instance, “*satoyama* and *satoumi*” in Japan is based on the harmonious interaction between humans and nature in rural landscapes and seascapes. “*Whakapapa*” in New Zealand emphasizes a cultural connectedness that encompasses both ancestry and nature and determines relationships and obligations. These examples of Indigenous and relational philosophies and ways of being exemplify long-standing practices that align with transformative change principles and values: care for nature, equity and intergenerational responsibility.^b

While these principles often align with Indigenous cultures on terrestrial ecosystems, there are also examples of countries restoring a harmonious relationship with marine ecosystems. For instance, China has promoted the comprehensive improvement of the marine eco-environment and has continuously advanced the building of beautiful bays as part of an effort to achieve multiple benefits in seven pilot cities and prefectures.

a Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *The Nature Futures Framework a flexible tool to support the development of scenarios and models of desirable futures for people, nature and Mother Earth, and its methodological guidance*, Zenodo (2023).

b J. S. Te Rito, “Whakapapa: A framework for understanding identity”, *MAI Review*, Article 2 (2007). Available at <https://journal.mai.ac.nz/system/files/maireview/56-65-1-PB.pdf>

Operationalizing a nexus approach and advancing transformative change also requires significant reforms to siloed and fragmented governance structures.

Integral to inducing these shifts in values is the complementary need for integrative, holistic and transdisciplinary framing of policies and practices. Framing decisions through this integrative lens is essential to recognize and contextualize interdependencies across nexus elements, explicitly delineating important relationships and dynamics (IPBES, 2024a). This often also involves breaking down barriers between different disciplines and ways of thinking. In fact, embracing transdisciplinarity can help bring together diverse perspectives and skills needed for transformational change. Further, this extends beyond scientific knowledge to include Indigenous and local knowledge because conservation and sustainable use of biodiversity and ecosystem services varies across socioeconomic and cultural conditions. Transdisciplinarity is hence essential for strengthening connections between nature and people.

Nexus and transformative governance

In many cases, operationalizing a nexus approach and advancing transformative change also requires significant reforms to siloed and fragmented governance structures. The IPBES Nexus Assessment groups many of the needed changes under a shift toward nexus governance. Nexus governance entails “the development and use of coordinating structures and processes that enhance the engagement of multiple actors through horizontal (e.g. across various nexus elements and associated sectors) and vertical (e.g. cross-scale connectivity or multilevel governance) channels to address nexus challenges, identify policy and sociopolitical options and manage their implementation” (IPBES, 2024a, p. 42) (see also Chapter 8). Nexus governance thereby provides the operational architecture needed for policies based on a nexus approach, while also integrating transdisciplinary knowledge and value systems of diverse actors consistent with transformative change (IPBES, 2024a). It is therefore well aligned with the four principles to address the underlying causes of biodiversity loss and nature’s decline together with one of the strategies (“transform governance systems”) listed in table 3.1. Table 3.2 outlines key components of nexus governance, demonstrating how it connects to those previously discussed principles.

Table 3.2 Mapping the key components of nexus governance to nexus challenges and the principles of transformative change and actions to support transformative governance

Key component of nexus governance	Relationship to four key principles of transformative change and actions to support transformative governance
Integrative, holistic and transdisciplinary framing of problems and solutions	• Principle: Respectful and reciprocal human-nature relationships • Action: Strengthening biodiversity-related values in integrated governance across sectors
Inclusive approaches that bring about enhanced arenas of actor engagement	• Principle: Pluralism and inclusion • Action: Engaging diverse actors in inclusive governance to increase responsibility to act on biodiversity
Normative considerations of equity and justice, alongside accountability	• Principle: Equity and justice • Action: Engaging diverse actors in inclusive governance to increase responsibility to act on biodiversity
Enhanced mechanisms and processes for collaboration and coordination across scales and sectors	• Action: Securing collaboration and accountability through multilateral governance to address global interdependencies
Adaptive, reflexive and experimental approaches to learn from what works and to scale these solutions	• Principle: Adaptive learning and action • Action: Strengthening learning through informed, accountable and adaptive governance based on diverse knowledge systems

Source: Adapted from Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *IPBES Nexus Assessment: Summary for policymakers*, figure 5, Zenodo (2024a); and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), *IPBES Transformative Change Assessment: Summary for policymakers*, Zenodo (2024b).

By definition, nexus governance requires connecting relevant actors and sectors to generate synergistic multisectoral and multi-stakeholder solutions. This often begins by strengthening coordination across government agencies working at different levels of decision-making through a whole-of-government approach (see also Chapter 8). Such an approach is not merely about coordination across agencies with different sectoral remits; it also involves vertically integrating globally agreed goals such as the Aichi targets and SDGs into the national, prefectural/district, municipal and household levels. Working across these different scales is particularly important for preventing “spillover effects” – a kind of trade-off wherein solving an environmental problem in one jurisdiction creates another problem elsewhere (IGES, 2024). A whole-of-government approach also requires going beyond changes to institutional structures; it requires the same kind of integrative, holistic and transdisciplinary framing emphasized in the previous discussion of transformative changes.

Governance arrangements that support coordination across spatial scales are also needed to manage the synergies and trade-offs associated with the globalized flow of people, goods, funds and information. In this case, it merits noting that livelihoods are increasingly dependent on distant areas and resources. For instance, cities depend heavily on surrounding regions for water, timber and food. Consequently, urban sustainability cannot be achieved without securing the ecological integrity of distant watersheds, forests and agricultural lands upon which cities rely. However, local development and environmental plans are often restricted to the municipal level. While higher level governments carry out wide-area coordination beyond municipalities, these efforts frequently lack the functional or spatial integration required to manage resources across administrative boundaries effectively. Enabling different actors to work across these boundaries is hence another key component of nexus governance (see also Chapter 5). The same applies to transboundary cooperation on issues that naturally cut across political boundaries such as water management.

Yet an additional crucial part of nexus governance involves inclusion. Reflecting a whole-of-society approach, inclusivity focuses on meaningful participation of and uniting key stakeholders to solve complex problems (Ruggiero, Piotrowicz and John, 2024). Inclusive approaches also imply empowering different rights holders and enabling varied sources of knowledge to enter decision-making processes, including Indigenous and local knowledge. Active engagement with these stakeholders and sources of knowledge is critical for the co-design and co-implementation of synergistic solutions (IPBES, 2024a). Co-design, in turn, often depends on improving a wide range of capacities and technical skills (IPBES, 2024a).

The emphasis on inclusivity is also consistent with two other core principles underpinning nexus governance: namely, equity and justice. Foregrounding equity and

justice in decision-making processes can help resolve trade-offs and balance power asymmetries through more transparent and accountable actions (IPBES, 2024a). For example, human rights-based approaches that set out obligations and procedures on rights, such as access to water and food as well as access to information and participation, help foster equity (Olawuyi, 2020; Sharma and Kumar, 2020).

Inclusion and collaboration can also be combined with adaptive approaches that embrace complexity, uncertainty and change in order to effectively address feedbacks and compounding issues across the nexus elements, while allowing participants to contemplate alternative futures (IPBES, 2024a). As such, embedding reflection and experimental learning in decision-making processes can help foster adaptive solutions and ensure accountability (Yuan and Lo, 2022). Including citizen science and reflective approaches, such as improving reflexivity can enable an individual or group to examine themselves in relation to their actions and interactions with others (Pienkowski and others, 2023). When combined together with iterative monitoring of response outcomes, reflexive approaches can help manage future trade-offs and unintended consequences. Engaging in adaptive processes can also deepen awareness of problems that undermine nature-positive and sustainable futures and change behaviours (IGES, 2024).

Altering views and building consensus rarely occur instantaneously; they require time, effort and sustained support.

However, altering views and building consensus rarely occur instantaneously; they require time, effort and sustained support. In this regard, the role of a facilitator who interacts and coordinates among stakeholders is particularly important. Facilitation requires providing knowledge and acting as a bridge between experts and non-experts. In order to promote problem-solving, including NbS through collaboration with diverse stakeholders, it is also important to incorporate the views of policymakers as well as those from the business and private sectors (IGES, 2024). A practical approach that can help different policymakers, business people and other stakeholders implement synergistic actions based on their engagement in reflexive and adaptive processes are sustainability-oriented labs, including urban living labs and SDG labs (McCrory and others, 2020; Jarzebski and others, 2023).

Table 3.3 Summary of the case studies

Areas of synergies	Synergistic solutions/ approaches	Key actors	Enablers
Case study: Transforming paddy rice systems for biodiversity conservation in Sado, Japan SDGs: 2 3 11 13			
Biodiversity conservation, water management, climate change mitigation and adaptation, traditional food culture	Rice certification for environmentally friendly paddy farming	National and local governments, farmers, agricultural cooperative, researchers	- Living labs - Synergistic financing schemes
Case study: Promoting nexus approaches through the Satoyama Initiative in sacred grove restoration in India SDGs: 1 2 3 4 6 11 13 15 17			
Biodiversity, food, water, climate, health	Global networking built around a nexus approach	- National/local governments - NGOs - Research institutions - The private sector - The United Nations and other intergovernmental organizations - Local universities - Indigenous peoples and local communities	- Nexus governance - Inclusive institutions
Case study: Eco-function zoning map for biodiversity and supply chain risk screening in China SDGs: 6 11 12 15			
- Biodiversity conservation - Pollution control - Sustainable supply chains	Spatial zoning and mapping tools for ecological risk screening and integration into finance and supply chain decisions	- The Ministry of Ecology and Environment - Institute of Public and Environmental Affairs - Financial institutions - Companies	- Public environmental data systems - Open-access platforms - Regulatory frameworks
Case study: Simulation-based water allocation for a participatory water-energy-food nexus in Sri Lanka SDGs: 2 6 7 17			
Water-energy-food nexus	Simulation model integrated with participatory planning for seasonal water allocation and multisector coordination	- Mahaweli Authority - Irrigation Department - Ceylon Electricity Board - Local stakeholders	- Long-term hydrological data - Institutionalized stakeholder processes - Coordination mechanisms

3.3 Case studies

Transforming paddy rice systems for biodiversity conservation in Sado, Japan

Sado rice is a high-quality brand product from Sado island, Japan. The island is known for its traditional rice cultivation system, characterized by a dynamic mosaic of woodlands, plantations, grasslands, paddy fields, wetlands, irrigation ponds and canals. The cultivation system not only provides food and habitat for local biodiversity but also supports various cultural customs, such as Noh theatrical performances and shrine rituals. The Food and Agricultural Organization recognized Sado as one of the first Globally Important Agricultural Heritage Systems in June 2011 (García-Martín and others, 2022).

Sado possesses many resources and species that lend themselves to a nexus approach and nexus governance. The Japanese crested ibis is the most symbolic species within Sado's rich biodiversity and feeds on small living creatures, such as fish, loaches and worms that live in and around the rice paddies. To promote ibis-friendly agriculture, Sado City, in collaboration with the Sado Agricultural Cooperative introduced the *Toki-to-kurasu-sato* (villages coexisting with the crested ibis) rice certification initiative in 2010. Prior to the full implementation of this certification, the city government introduced direct payments to certified producers and established demonstration farms and technical tutorials for farmers across the 10 districts of Sado Island in 2008. To help farmers attain this certification, the government also supported eco-farming practices by collaborating with the Sado Agricultural Cooperative to market the certified rice at higher prices than conventional

Sado-grown rice, allowing certified rice producers to receive a price premium derived from the higher retail price of certified rice (Takahashi and others, 2023).

The history of the Crested Ibis Rice Certification scheme can be divided into four phases (Takahashi and others, 2023). The first phase, between 2001 and 2003, was motivated by the first successful captive breeding of the crested ibis in 1999. It involved experimenting with rice farming methods aimed at rehabilitating the crested ibis' prey, alongside biodiversity monitoring conducted by a farmers group. The second phase focused on stabilizing the innovative design of the program and spanned from the establishment of Sado as a city in 2004 to the introduction of the Crested Ibis Rice Certification scheme in 2008. The third phase, concentrating on diffusion, occurred between 2009 and 2020, during which the certified paddy area gradually increased and peaked at 25 per cent of the island's total rice paddy area. The fourth phase, involving full system deployment, has yet to be reached as the certified paddy area has gradually decreased since peaking in 2016.

To coordinate fragmented initiatives and activities related to biodiversity conservation, water management, climate change mitigation and adaptation, and traditional food culture, stakeholders including the local university, local government, non-governmental organizations and businesses launched the Sado Living Lab for Sustainability in 2022. This lab facilitates cyclic processes of learning, visioning and actioning through the development of a database of knowledge and initiatives, connecting and networking existing efforts, and forming communities.

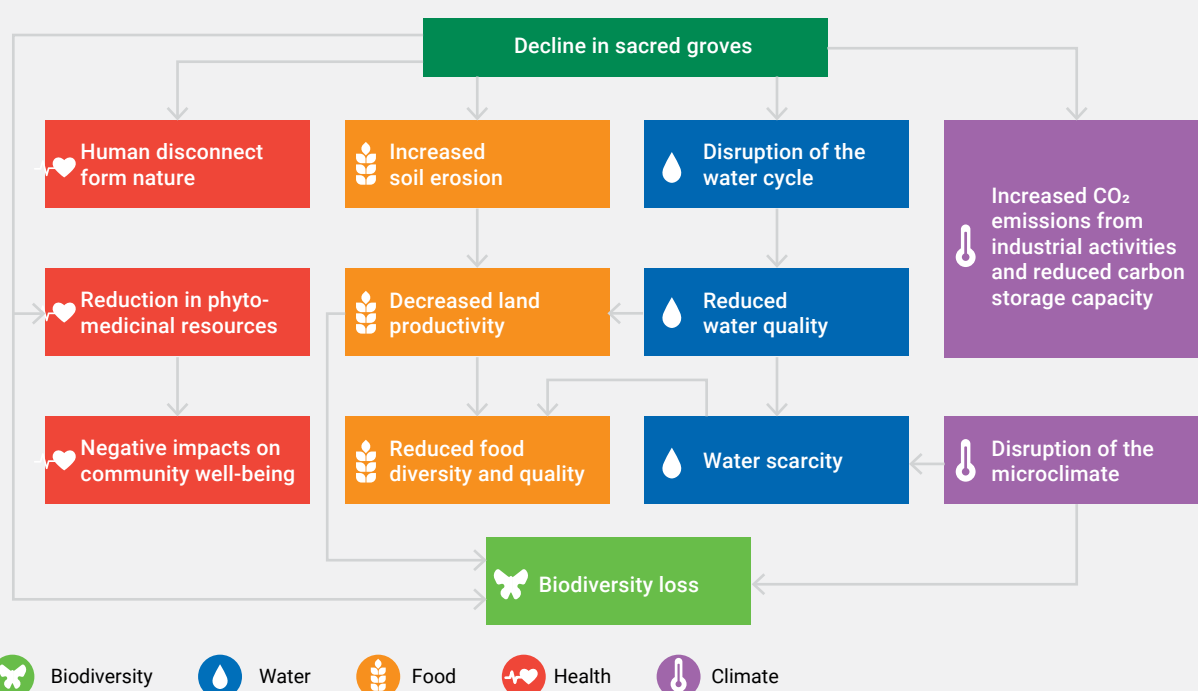
Three key functions of the lab include: 1) generating innovations; 2) capacity-building; and 3) participatory policy design. Currently, the lab is implementing more than six projects including initiatives exploring new uses of seagrass and bamboo, mapping and visualizing local resources, promoting ethical production and consumption, eco-tourism, job creation, capacity-building and future scenario-building using the NFF.

Promoting nexus approaches through the Satoyama Initiative in sacred grove restoration in India

The Satoyama Initiative is a global effort to realize “societies in harmony with nature” through the promotion of socioecological production landscapes and seascapes (SEPLS), where biodiversity conservation and human livelihoods are interconnected. The Initiative is based on using model landscapes that are traditionally formed through the synergistic practice of sustainable agriculture, forestry and fisheries, mainly observed in rural communities in Japan (known as *satoyama* or *satoumi* in Japanese) as well as in many other parts of the world (e.g. *dehesa* in Spain, *ahupua'a* in Hawaii, *mauel* in the Republic of Korea, *terroirs* in France) (United Nations University, 2013).

In the Malaiyali community, that resides in the Kalrayan hills of South India, a project was implemented by the Vellore Institute of Technology with support from the Satoyama Development Mechanism Fund (a mechanism that provides funding under the Satoyama Initiative).

Figure 3.3 Cascading negative effects on nexus elements due to the decline in sacred groves in India



Source: Institute for Global Environmental Strategies (IGES), “TT6: How do socio-ecological production landscapes and seascapes (SEPLS) promote the nexus approach?” YouTube video 14 October 2025. Available at <https://www.youtube.com/watch?v=k31IW4bmN-M>

The funding aimed at restoring sacred groves that are important for nature (through biodiversity conservation) and people (through their connection to the religious beliefs of the local community), in cooperation with Indigenous communities to support building a sustainable socioeconomy.

The local Malaiyali people depend on natural resources found in sacred groves for food, medicines, construction materials and various economic uses, including mat-, net- and rope-making. The project was designed to address threats to the sacred groves, such as urbanization, conversion of land for agriculture, migration of young people and the lack of policies for protection and conservation. The initiative involved the implementation of five activities aimed at helping the local community to leverage the nexus approach to reverse these trends: 1) mapping and documenting threatened medicinal plant diversity in sacred groves; 2) documenting conservation practices for the protection of sacred groves; 3) undertaking *in vitro* conservation of medicinal plants in sacred groves; 4) restoring threatened plants and raising awareness of sustainable socioeconomic development through tree planting and awareness programmes; and 5) developing training manuals. By implementing these activities and working across key nexus elements the case offers an example of how local initiatives can evolve into broader strategies for transformative change towards a more sustainable society (see also table 3.1) (IPBES, 2024b).

Eco-function zoning map for biodiversity and supply chain risk screening in China

The Ecological Conservation Redline and the “Three Lines and One List” eco-environmental zoning framework in China provide a national spatial basis for ecological protection, environmental risk prevention and differentiated environmental management (China, Ministry of Ecology and Environment, 2021). Building on publicly available data under this framework, the Institute of Public and Environmental Affairs developed an eco-function zoning map. This map integrates multiple layers, including biodiversity conservation, pollution control, environmental risk management and resource efficiency, reflecting the principles of a nexus approach.

To implement the project, a mapping tool was used to screen ecological sensitivities and environmental risks associated with projects and supply chains, enabling users to identify whether activities are located in or near ecologically sensitive or regulated areas. By integrating spatial data with environmental and regulatory information, the tool allows financial institutions and companies to incorporate biodiversity and environmental considerations into decision-making processes (see also Chapter 7).

Importantly, the tool was applied in several real-world contexts to protect different biodiverse resources. For example, the Postal Savings Bank of China integrated ecological zoning data into its internal risk monitoring system to support environmental risk identification and management (Postal Savings Bank of China, 2025). Similarly, ASUSTeK Computer Inc. used the Institute of Public and Environmental Affairs platform to identify suppliers located near ecologically sensitive areas and guide follow-up engagement (ASUSTeK Computer Inc., 2024). These applications demonstrate how spatial environmental data can inform both financial and corporate decisions along supply chains.

This case highlights key SDG synergies across biodiversity conservation, pollution control, climate action and sustainable production. By enabling early-stage risk screening, the tool supports the alignment of economic activities with ecological constraints, helping to reduce environmental risks while improving resource efficiency and supply chain sustainability.

Simulation-based water allocation for a participatory water-energy-food nexus in Sri Lanka

Water allocation in the Mahaweli basin in Sri Lanka illustrates how simulation-based modelling combined with stakeholder participation can support a nexus approach to water, energy and food systems (Manthrithilake and Liyanagama, 2012). The basin is central to the national economy and livelihoods, with water distributed across multiple sectors, including irrigation, hydropower and drinking water supply. These interdependencies create trade-offs, particularly during periods of low reservoir capacity, when competing demands can lead to conflicts.

To address this complexity, the Government of Sri Lanka introduced the Acres Reservoir Simulation Programme in the mid-1980s to manage water allocation across major systems, including 7 basins, 18 reservoirs, 19 irrigation zones and 13 hydropower plants (Chandrasekara and others, 2021). The model uses long-term hydrological data and system parameters to simulate water allocation scenarios and assess outcomes across sectors.

Importantly, the work across these sectors is embedded in a highly participatory inclusive decision-making process, operating in four key stages: 1) pre-season planning stage: data on crop plans and sectoral water demands are collected through local consultations and integrated as model inputs; 2) scenario simulation: the model simulates monthly scenarios over a 30-year period to evaluate outcomes for irrigation, hydropower, drinking water and flood control; 3) stakeholder agreement: based on the results, seasonal water allocation plans are agreed upon

through consultations and implemented by relevant agencies via coordination meetings; and 4) post-season review: performance is assessed after the season to inform and improve subsequent planning cycles.

This integrated system manages about 72 per cent of the country's surface water resources and has contributed to improved hydropower generation, water supply reliability and agricultural productivity. It demonstrates key SDG synergies across water-use efficiency, food production, energy security and institutional coordination.

3.4 Enablers for scaling and replication

Achieving a nature-positive Asia-Pacific region requires an enabling environment capable of supporting integrated, systemic and transformative action. The following enablers create the foundation necessary to operationalize synergy-driven approaches across biodiversity, climate, food, water and health systems. These also reflect key synergistic approaches detailed in section 3.2.

Economic and financial transformation

Transforming economic systems is essential for reversing biodiversity loss and achieving nature-positive development. Placing natural capital at the centre of fiscal and economic decision-making through, for instance, natural capital accounting, ecosystem valuation and performance-based budget allocations allows governments to evaluate long-term costs and benefits more accurately and guide more informed public expenditure. Finance can also be generated by reforming harmful subsidies and redirecting them towards nature-positive development. Further, blended finance instruments, public-private partnerships, green bonds and risk-sharing facilities are key to mobilizing private capital while reducing investment barriers for NbS (Thompson and others, 2023; Chausson and others, 2023). Developing national nature-positive investment pipelines, supported by clear project standards, social safeguards and credit enhancement can help attract institutional investors (see Chapter 6).

Countries in the region are advancing these reforms to scale NbS. For example, the Low Carbon Development Initiative in Indonesia integrates natural capital accounting directly into national planning. This demonstrates that forest protection and low-carbon growth generate higher long-term GDP and social gains than extractive pathways (Bappenas, 2021). The ecological compensation schemes and provincial eco-funds in China illustrate how budgetary mechanisms can incentivize restoration at scale and the inclusion of biodiversity in its green finance taxonomy indicates growing alignment with nature-positive investment standards (World Bank, 2022). The adoption of environmental-economic accounting and the Living

Standards Framework in New Zealand demonstrate how natural capital and well-being are increasingly embedded in fiscal frameworks (OECD, 2019).

Environment, social and governance (ESG) investment which incorporates non-financial ESG considerations into investment decisions has expanded internationally (see also Chapter 6). For example, the number of signatories to the Principles for Responsible Investment has increased from 63 in 2006 to over 1,000 in 2012 and to 5,300 as of 5 May 2024. In addition, the Task Force on Climate-related Financial Disclosures (TCFD), established in 2015, urges companies to disclose climate-related financial information on environmental impacts and CO₂ emissions from supply chains. Similarly, the Task Force on Nature-related Financial Disclosures (TNFD), the biodiversity version of the TCFD, provided a framework for appropriately assessing and disclosing risks and opportunities related to natural capital and biodiversity in its recommendations in September 2023. These common international frameworks are expected to support sustainable business and management and contribute to building a sustainable society through these frameworks. From the perspective of sustainable investment and management, engaging with various stakeholders, including investors, funding recipients, business partners, customers and local communities, through constructive dialogue is also an important factor.

Transforming economic systems is essential for reversing biodiversity loss and achieving nature-positive development

There is an active movement to promote collaboration and cooperation through public-private partnership platforms in Japan (IGES, 2024) (see Chapter 6). Some private sector initiatives have emerged without direct guidance from the government. For instance, the Keidanren Nature Conservation Council of Keidanren (Japan Business Federation) has conducted an annual survey on corporate biodiversity actions in Japan since 2022. The latest survey results from 2024 found that: 1) companies are increasingly integrating biodiversity into corporate management as compared with fiscal year 2023; 2) many companies are undertaking high quality biodiversity actions that contribute to the KMGBF; and 3) a rapidly increasing number of companies have progressed in terms of their TNFD information disclosure (KNCC, 2025). However, the survey also showed that action on biodiversity is lagging behind action on climate, although the proportion of companies with integrated TCFD-TNFD reporting and with synergistic climate-biodiversity actions is increasing.

Integrated data, monitoring and decision support systems

Robust integrated data and monitoring systems are fundamental to a nature-positive transition and the achievement of SDG synergies. Robust monitoring of species, ecosystems and pressures, combined with integrated geospatial information, natural capital accounts and shared data standards, enables evidence-based policymaking, transparent decision-making and efficient investments that maximize synergies across sectors. However, many countries in Asia and the Pacific continue to face significant data gaps, particularly regarding species distribution, ecosystem integrity, nature-related risks and ecosystem service values, which constrains effective planning and accountability (IPBES, 2018). Across the region, expanded investments in open-data platforms and community and citizen science networks can significantly enhance the quality and utility of biodiversity information while strengthening national monitoring of the KMGBF targets (Arvanitidis and others, 2025).

As highlighted in Chapter 7, decision support tools are essential for operationalizing nexus governance. These tools strengthen institutional capacity by: 1) defining nexus-relevant objectives and targets; 2) facilitating the selection of optimal response options; and 3) identifying opportunities for scaling successful interventions. Current tools effectively integrate water, food, climate and biodiversity data, yet linkages to health remain a significant blind spot. Future development must prioritize tools that emphasize health and support knowledge co-production. These 'bridging' tools are vital for navigating trade-offs and ensuring that Indigenous and local knowledge is meaningfully included in formal decision-making processes.

Examples from across the Asia-Pacific region demonstrate how these tools are being operationalized. The national geospatial platform in Thailand integrates forest cover, mangrove restoration and disaster risk information, demonstrating how unified data systems can support cross-sectoral planning (Kittipaisalsilpa, 2025). The National Biodiversity Information System in the Republic of Korea consolidates species and ecosystem data, and makes them accessible through public dashboards, improving transparency and priority-setting (Park and others, 2018). The Threatened Species Index and environmental-economic accounts in Australia provide consistent metrics that link biodiversity trends with fiscal and regulatory decisions (King and others, 2021; Giljohann and others, 2025).

Australia has conducted a series of national surveys on nature connection since studies around the world have shown that people who are more connected with nature are more likely to engage in pro-environmental behaviours, highlighting its importance as a leverage point for sustainability (Sollis and others, 2025). This is why it features prominently in a number of conservation policies, including its Strategy for Nature. Nature

connection has multiple dimensions, which the surveys measure through three dimensions: identity, experience and philosophy.

The NFF has been localized in Indonesia, Japan, New Zealand and the Philippines to co-design future scenarios/pathways, considering pluralistic values of nature (Haga and others, 2023; Lahoti and others, 2023; 2025). Lahoti and others (2023) reviewed over 300 policy options that were planned and/or implemented in 90 SEPLS across three countries in Asia (Japan, the Philippines and Indonesia) by using the NFF. The NFF filtering indicates a stronger lean toward a "nature as culture/one with nature" perspective, achieved through solutions targeting sociocultural and behavioural change and community-based management. The solutions and the filtering allowed an understanding of the differing approaches that can guide other synergistic solutions. Although case studies using the NFF are increasing globally, examples in the Asia-Pacific region are still limited.

Policy integration and coherence

A nature-positive transition requires the mainstreaming of biodiversity across national development planning, climate strategies, agricultural policies, water management, urban planning, pollution management and disaster risk reduction frameworks. Integrating biodiversity into Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) and sectoral policies helps ensure that ecosystems are treated as core assets for resilience and prosperity rather than standalone environmental issues. Whole-of-government approaches, supported by inter-ministerial committees, mutual learning exercises, joint land-use planning and clear institutional mandates, are central to avoiding policy fragmentation and aligning incentives across ministries (see also discussion of transformative governance in Chapter 8) (European Commission, Directorate-General for Research and Innovation, 2024).

Several countries have already demonstrated what integrated planning can look like in practice. The National Climate Change Action Plan of the Philippines links ecosystems and food-water-energy security through a strong coordination model driven by the Climate Change Commission. The National Mission for Green India integrates forest restoration into rural development, energy and water programmes, showing how regenerative landscapes can support multiple national priorities simultaneously across the country. The National Development Plan of Fiji also illustrates integrated planning by embedding ecosystem-based adaptation into coastal, urban and agricultural strategies. The National One Health Strategic Plan (2020–2030) of Bangladesh brings together the Ministries of Environment, Health and Livestock, alongside disaster management authorities, to monitor zoonotic disease risks, protect ecosystems and strengthen climate-adaptive surveillance systems. In Viet Nam,

the National Action Plan for Transforming Food Systems (2022–2030) links biodiversity conservation with climate adaptation, food security and rural livelihoods by promoting agroecological practices, integrated landscape management and reduced agrochemical dependence. These examples highlight that integrated actions and policy coherence enhance nature-positive development and generate SDG synergies.

Inclusive governance, knowledge-sharing and integration

Inclusive governance serves as a foundational enabler for transformative, nature-positive change. It is imperative to strengthen the rights and roles of Indigenous peoples and local communities, ensure gender-responsive and participatory decision-making, and institutionalize transparent benefit-sharing mechanisms to achieve durable conservation outcomes and ensure that transitions do not exacerbate existing inequalities. Such measures are also important to ensure both procedural and distributive justice as addressed in section 2.3. Integrating scientific knowledge with Indigenous and local knowledge systems promotes holistic and place-based solutions that reflect the diverse values of nature. Participatory monitoring, community science and co-learning platforms create opportunities for shared innovation, adaptive management and long-term stewardship. Furthermore, they address the underlying drivers of biodiversity loss, such as inequity, power asymmetries and exclusion.

Inclusive governance serves as a foundational enabler for transformative, nature-positive change.

Examples across the region demonstrate the impact of inclusive governance. In New Zealand, co-governance arrangements for ecosystems such as the Whanganui River and Te Urewera elevate Indigenous relational values and create legal and cultural frameworks that reshape ecosystem management (Rodgers, 2017). The long-standing community forestry programme in Nepal has demonstrated how empowering local user groups to manage forests sustainably has resulted in increased carbon stocks, improved biodiversity and enhanced livelihoods (Luintel, Bluffstone and Scheller, 2018). The *satoyama* and *satoumi* landscapes in Japan exemplify the efficacy of community-led stewardship of mosaics of forests, farmlands and coastal ecosystems in sustaining biodiversity while supporting food systems and cultural heritage (JSSA, 2010). These examples illustrate that inclusive governance fosters social legitimacy, strengthens stewardship and optimizes ecological outcomes.

Regional cooperation and multi-country platforms

Regional cooperation plays a critical role in addressing transboundary ecosystems, harmonizing standards and scaling nature-positive solutions. Investing in regional data standards, early-warning systems and cross-border ecosystem monitoring, such as for migratory species, marine pollution and transboundary waters, could further enhance collective resilience and support coherent implementation of national biodiversity strategies. Platforms, such as the Coordinating Body on the Seas of East Asia (COBSEA), the ASEAN Centre for Biodiversity, the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security, ESCAP, the International Partnership for the Satoyama Initiative (IPSI), the Mekong River Commission, the South Asia Co-operative Environment Programme and the Secretariat of the Pacific Regional Environment Programme (SPREP) (see also Chapter 8), can support coordination across countries through joint planning, capacity-building, knowledge-sharing and the development of regionally aligned financing frameworks. Strengthening cross-border governance mechanisms is especially important for shared river basins, migratory species, marine ecosystems and mountain ranges.

One example of such a platform is the IPSI, which was established on 19 October 2010, during the 10th Conference of the Parties to the Convention on Biological Diversity (CBD COP10) held in Nagoya, Aichi, Japan. IPSI has promoted harmonious interactions between humans and complex socioecological systems that can provide both human well-being and biodiversity conservation, respecting tradition and culture forming SEPLS.

In November 2025, the Japan-China-Korea Toki (crested ibises) Municipality Summit was held in Sado island (see section 3.1), inviting mayors and representatives of local governments who promoted the return of crested ibises to the wild in China, Japan and the Republic of Korea. This summit aimed at enhancing partnerships between the local governments of the three countries to realize a society in which people and crested ibises coexist. Participants shared lessons learned from their experiences of rewilding crested ibises while revitalizing rural communities under the common challenges of aging and depopulation in East Asia.

Regional partnerships on NbS can help establish common principles, pool financing and accelerate replication of effective models. By working together, countries can leverage collective strengths, reduce duplication and scale the impact of biodiversity and nature-positive coral investments far beyond national boundaries. Furthermore, regional collaboration on green taxonomies and nature-positive investment criteria can harmonize market signals, reduce fragmentation and strengthen investor confidence across borders (see also the discussion of partnerships in Chapter 8).

3.5 Key insights and recommended actions

Achieving the global goals and targets of the 2030 Agenda, the CBD, UNFCCC, and other multilateral environmental agreements (MEAs), alongside national and local biodiversity strategies (e.g. NBSAPs and LBSAPs), requires the urgent translation of policy ambition into tangible implementation. To bridge this gap, the chapter has outlined three key synergistic approaches, relevant case studies and enablers that can support their scale across the Asia-Pacific region. The following actions are recommended for different stakeholders across the region to advance the synergistic approaches and enablers discussed in this chapter:

Recommendations for national governments

- Update and scale NBSAPs in full alignment with the KMGBF and relevant MEAs. Nature-positive transitions must move to the centre of NDCs and NAPs to ensure a coordinated, whole-of-government response to climate, biodiversity and land degradation.
- Adopt cross-ministerial planning to apply the nexus approach at the national level. This can facilitate the maximization of synergies between biodiversity management, climate change mitigation and resource circulation. Such planning involves integrating biodiversity targets into core economic and SDG strategies to break down traditional sectoral silos.
- Transition toward a 'nature-positive economy' by reforming subsidies and implementing fiscal incentives for regenerative practices, and adopt metrics that go beyond GDP to inclusive wealth so as to reflect the true value of natural capital in national accounts.
- Formalize the recognition of Indigenous and local knowledge by integrating intrinsic, relational and instrumental values into policy. Empowering Indigenous peoples and local communities as co-managers strengthens nature-connectedness and ensures the sustainable stewardship of biological resources.
- Foster public understanding of the interconnections between biodiversity and natural capital, climate change and resource circulation across society, and establish decision-making mechanisms that integrate these perspectives.

Recommendations for local governments

- Localize biodiversity goals by developing local biodiversity strategies and action plans that align with national and global frameworks, ensuring coordination with departments beyond the environmental sector to foster urban-rural resilience.
- Establish experimental 'policy labs' that demonstrate how nexus and transformative approaches work in practice. This can include initiating local pilot projects to co-design NbS with Indigenous peoples and local communities that provide simultaneous co-benefits for water security, food systems and public health.

- Implement local incentive mechanisms to bring funding for nature-positive solutions. Deploy tools such as payment for ecosystem services to reward sustainable stewardship in the agriculture, forestry and fisheries sectors.

Recommendations for development partners

- Mainstream 'nexus financing' into project planning. Shift from siloed, single-sector funding toward multi-objective finance facilities. Projects should be required to demonstrate measurable co-benefits across the biodiversity-climate-health nexus to stabilize Earth's life-support systems.
- Support the use of tools and build capacities for pluralistic planning. Provide technical and financial assistance to help countries localize the NFF, to move from 'business-as-usual' trajectories to 'desirable futures' that prioritize nature-human harmony and the balanced use of the diverse values of nature.
- De-risk private investment in NbS. Use blended finance and guarantees to encourage the private sector to invest in NbS, particularly in resilient infrastructure and sustainable supply chains, while ensuring strict adherence to the rights and knowledge-sharing protocols of Indigenous peoples and local communities.
- Build capacity for integrated monitoring of NbS and nexus approaches. Assist governments in developing advanced data systems that track the quality of nature's contributions to people and ecosystem integrity, rather than focusing solely on species loss.

Recommendations for regional cooperation

- Establish a regional NbS partnership to harmonize standards, facilitate transboundary data-sharing and create a regional taxonomy for nature-positive investments.
- Strengthen transboundary ecosystem management. Enhance joint governance frameworks for shared natural assets, including major river basins (e.g. the Mekong river basin), migratory corridors and marine ecoregions like the Coral Triangle, as well as Large Marine Ecosystems, such as the Gulf of Thailand.
- Expand regional knowledge hubs. Utilize platforms such as the ASEAN Centre for Biodiversity as regional clearing houses for nexus-based best practices and Indigenous and local knowledge-led conservation models.
- Adopt regional 'nature-positive' targets grounded in nexus framing. Formalize a regional commitment to the 30by30 goal (related to KMGBF Target 3), specifically prioritizing biocultural landscapes and community-led conservation over exclusionary 'fortress' protection models.

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CHAPTER 4

Advancing circular economy solutions to address pollution



Key messages

- 1 Pollution in the Asia-Pacific region is a systemic outcome of agrarian and industrial materials management.** Pollution results from how food, housing, mobility and energy systems are organized, rather than from isolated failures in waste policy or regulation.
- 2 Circular economy strategies are most effective when framed as pollution prevention at the source.** These strategies address material throughput, product lifetimes and system design, rather than relying on end-of-pipe controls.
- 3 Synergies should be deliberate not incidental policy outcomes.** Aligning circular economy approaches, pollution reduction, climate mitigation, health and social inclusion objectives yields outcomes that exceed sector-specific interventions.
- 4 Provisioning systems are critical leverage points for achieving synergies.** Circular economy interventions in agrifood, the built environment, mobility and energy consistently deliver combined benefits for air and water quality, climate, livelihoods and equity.
- 5 Finance, data and governance determine scale, not technical feasibility of synergistic approaches.** Fragmented institutions, misaligned incentives and weak monitoring frameworks remain the main constraints on replication and system-wide impact.
- 6 The Asia-Pacific region already hosts potentially scalable proofs-of-concept for synergies.** The region demonstrates that pollution reduction, economic value creation and social inclusion can be jointly achieved when circular economy measures are embedded in development strategies.

4.1 Introduction to synergies for pollution control and the circular economy

Addressing material use, waste and pollution, and advancing circular economy transitions in Asia and the Pacific are central to achieving sustainable development outcomes that combine economic prosperity, environmental integrity and human well-being. The region's development trajectory over recent decades has delivered substantial gains in income, infrastructure and access to services, lifting millions out of poverty. At the same time, these gains have been underpinned by rapidly growing material and energy use (Schandl and West, 2010), resulting in escalating waste generation, emissions and pollution pressures that now pose significant risks to ecosystems, public health and long-term economic resilience (UNEP, 2024).

A helpful way to frame these challenges and opportunities is through the lens of agrarian and industrial metabolism (Ayres and Simonis, 1994; Guzmán and others, 2018). The Asia-Pacific region is the world's largest user of natural resources, accounting for the majority of global extraction and consumption of biomass, metal ores, non-metallic minerals and fossil fuels (Schandl and others, 2024). These material and energy flows constitute the physical foundation of the region's core provisioning systems for food, housing, mobility and energy, which are essential to economic activity and human well-being (Fanning, O'Neill and Büchs, 2020). However, they also generate large volumes of waste, emissions and pollutants across air, water and land, contributing directly to environmental degradation,

climate change and adverse health outcomes (UNEP, 2025a). As populations grow, urbanization accelerates and consumption patterns evolve, pressures on these metabolic flows intensify rather than diminish.

These pressures give rise to a dual challenge for policymakers. On the one hand, countries across the region must continue to raise living standards, reduce poverty and address persistent inequalities within and between societies, while respecting ecological limits, protecting ecosystems and ensuring that development pathways do not impose disproportionate environmental and health burdens on vulnerable populations (O'Neill and others, 2018). Waste minimization and pollution control are therefore not merely technical or regulatory issues but core development concerns (Kumar, 2016). Approaches that treat waste and pollution in isolation, without considering resource use, production systems, infrastructure provision and social outcomes, are unlikely to succeed at the required scale or speed.

Instead, effective responses require linking pollution reduction to resource efficiency, circular economy strategies and social development objectives. This linkage is central to the ambition of achieving multiple Sustainable Development Goals (SDGs) simultaneously, particularly Good Health and Well-Being (SDG 3), Reduced Inequalities (SDG 10), Sustainable Cities and Communities (SDG 11), Responsible Consumption and Production (SDG 12) and Climate Action (SDG 13) (Griggs and others, 2013). It also aligns with the broader objective of decoupling economic activity and human well-being from environmental pressures and impacts (Schandl and others, 2016). In this context, pollution and waste are not only environmental externalities to be managed,

but signals of inefficiency and lost value within economic systems. These are also signals that can be addressed through systemic change rather than incremental end-of-pipe solutions (Davis and others, 2016).

This chapter, therefore, applies the concept of synergies as a guiding analytical and policy framework (Baldwin-Cantello and others, 2023). In the context of material use, waste, pollution and the circular economy, synergies refer to the positive interactions among measures that reduce waste and emissions, improve resource productivity and generate broader social and economic benefits (Geipele and others, 2018).

In practical terms, this means moving beyond narrowly defined waste management and pollution control strategies towards integrated interventions that reshape how provisioning systems operate (Schaffartzik and others, 2021). For example, improving public transport systems can reduce local air pollution and greenhouse gas (GHG) emissions while also enhancing equity by improving access to mobility for low-income households (Ramaswami and others, 2023). Similarly, circular economy measures such as material reuse, repair and recycling can reduce waste and pollution while creating jobs, lowering production costs and strengthening domestic value chains (Wiebe and others, 2019). When designed thoughtfully, such interventions can reinforce each other, yielding outcomes that exceed the sum of their individual parts (see also Chapter 1).

Synergies are understood not as incidental outcomes, but as the result of intentional alignment across policies, sectors, actors and levels of governance (Wiegant, Dewulf and Van Zeben, 2024). Achieving them requires coordinated action across ministries responsible for environment, industry, transport, energy, urban development and social policy, as well as engagement with local governments, businesses and communities. It also depends on supportive implementation mechanisms, including finance, data and analytical tools, and governance arrangements that enable integrated planning and decision-making (Chapter 6, 7 and 8). Without such alignment, well-intentioned interventions may remain fragmented, limited in scale or vulnerable to unintended consequences.

The remainder of this chapter explores how such synergistic approaches can be realized in practice across Asia and the Pacific. It examines key sources of pollution and waste associated with the region's agrarian and industrial metabolism, identifies entry points where circular economy strategies can deliver multiple benefits and highlights examples of integrated approaches that have already begun to shift outcomes. In doing so, the chapter aims to provide policymakers and practitioners with a clear rationale for pursuing synergies, practical insights into how to design and implement them, and evidence that pollution reduction and circular economy transitions can be powerful drivers of sustainable development when approached as mutually reinforcing objectives rather than competing priorities.

4.2 Synergistic approaches

Pollution and waste in Asia and the Pacific are not isolated environmental problems, but symptoms of how the region's agrarian and industrial metabolism is organized across core provisioning systems. Circular economy interventions provide a powerful entry point for addressing these challenges because they target the underlying drivers of material throughput, emissions and waste generation while simultaneously creating economic and social value (Singh and others, 2021). When implemented through a systemic lens, circular economy measures can reduce pollution loads, lower GHG emissions, improve resource efficiency and strengthen livelihoods, thereby generating synergies across multiple SDGs.

This section examines how circular economy interventions generate such synergies across four key provisioning systems: agrifood, housing and the built environment, mobility and energy, followed by a discussion of cross-cutting circular economy innovations that operate across sectors. Across all systems, eco-innovation, digital technologies, behavioural change and collaboration among public and private actors are critical to enabling these outcomes.

Box 4.1 The role of the circular economy

The circular economy provides a framework for systemic transformation. Rather than a linear 'take-make-dispose' model, it seeks to maintain the value of materials, energy and products in the system for as long as possible, while minimizing waste and avoiding harmful emissions. Applied to provisioning systems, the circular economy can enable more sustainable forms of consumption and production: reducing food loss and waste, reusing and recycling construction materials, shifting towards shared and low-emission transport, and building renewable-based energy systems that circulate materials such as metals, batteries and plastics.

For the Asia-Pacific region, the circular economy is not only a strategy for waste management; it is an opportunity to reconcile rising material demands with environmental limits. By embedding circular economy principles into food, housing, mobility and energy systems, the region can unlock pathways that deliver services more efficiently, reduce pollution loads and generate socioeconomic benefits.

Agrifood systems

Global agrifood systems are the primary drivers of environmental degradation, currently responsible for approximately 26 per cent of global GHG emissions (Poore and Nemecek, 2018). Beyond its carbon footprint, agriculture is the single largest contributor to habitat

loss worldwide, threatening 86 per cent of species with risk of extinction (Benton and others, 2021). Agrifood systems are also a major source of pollution including nutrient runoff, methane emissions, plastic and organic waste. These environmental impacts carry a staggering economic weight, as the global hidden costs of agrifood systems exceeds US\$ 10 trillion at 2020 purchasing power parity (FAO, 2024).

In agrifood systems, circular economy interventions focus primarily on reducing food loss and waste, closing nutrient loops and valorizing organic residues (Adegbeye and others, 2020). Key actions include improved post-harvest storage and logistics, food redistribution and valorization, composting and anaerobic digestion, and the reuse of agricultural by-products as inputs for fertilizer, animal feed or bioenergy.

Digital tools, such as precision agriculture, nutrient mapping and supply-chain traceability, can further reduce the over-application of fertilizers and pesticides, and lower diffuse water pollution while improving productivity. Behavioural change initiatives, including dietary shifts and consumer awareness campaigns, complement these technical measures by reducing demand-side pressures.

Such interventions directly reduce nutrient runoff, water contamination, methane emissions from organic waste and plastic pollution associated with agricultural inputs and food packaging. By diverting organic waste from landfills and open dumping, they also reduce local air pollution and odour-related health impacts.

When implemented together, such measures generate multiple synergies. Reduced food waste lowers GHG emissions and pressure on land and water resources, contributing to climate mitigation (SDG 13) and biodiversity protection (SDG 15). Improved nutrient cycling reduces eutrophication of freshwater and coastal ecosystems (SDG 6 and SDG 14). At the same time, more efficient and resilient food systems enhance food security (SDG 2), improve farmer incomes and strengthen rural livelihoods, supporting poverty reduction and social inclusion (SDG 1 and SDG 10).

Housing and the built environment

The built environment is one of the most material- and emissions-intensive systems in the region, driven by rapid urbanization and infrastructure expansion (Lanau and others, 2019). Globally, the building and construction sector contributed 34 per cent of global GHG emissions in 2023 (UNEP, 2025b). Circular economy interventions focus on material efficiency, building retrofits, design for durability and reuse, and construction and demolition waste recovery. Examples include lightweight design, modular construction, reuse of secondary materials and retrofitting existing buildings for energy and resource efficiency rather than demolition and replacement (Zhang, Gruhler and Schiller, 2023).

Digital design tools such as building information modelling, material passports and urban mining approaches support more efficient material use and recovery. Policy instruments such as green building codes, public procurement standards and incentives for renovation, instead of new construction, play a key enabling role.

These actions reduce dust, particulate matter and hazardous waste from construction activities, lower carbon dioxide (CO₂) emissions from cement and steel production, and decrease landfill pressure. Energy-efficient buildings also reduce emissions from electricity and heating, improving urban air quality.

Circular economy approaches in the built environment generate synergies across the SDGs, particularly Sustainable Cities and Communities (SDG 11), Responsible Consumption and Production (SDG 12) and Climate Action (SDG 13). Reduced material demand lowers resource extraction and associated ecosystem impacts (Life on Land, SDG 15). Retrofitting programmes can also deliver social benefits by lowering household energy costs, improving indoor air quality and enhancing thermal comfort, particularly for low-income households, thereby contributing to Good Health and Well-being (SDG 3) and more affordable housing.

Mobility systems

Mobility-related pollution in Asia and the Pacific is closely linked to fossil fuel dependence, private vehicle use and inefficient transport systems. In the region, GHG emissions from the transport sector are rising due to increasing rates of urbanization, expanded private vehicle ownership and increased energy demands. In 2023, the share of regional GHG emission in the transport sector accounted for 9.3 per cent (United Nations, ESCAP and UNEP, 2024). Circular-economy-oriented mobility interventions emphasize modal shifts to public and active transport, electrification, vehicle-sharing and extending the life and reuse of transport assets, including batteries.

Digital platforms play a central role in enabling shared mobility, route optimization and integration across transport modes. Behavioural change initiatives, such as incentives for public transport use and urban design that prioritizes walking and cycling, are essential complements to technological solutions.

These interventions reduce local air pollutants (PM_{2.5}, NO_x), GHG emissions and noise pollution, particularly in dense urban areas. Electrification of transport also reduces oil consumption and associated upstream pollution.

Synergistic mobility strategies deliver significant health benefits through improved air quality (SDG 3), contribute to climate mitigation (SDG 13) and reduce congestion-related economic losses. By improving access to jobs, education and services, especially for lower-income populations, these measures also advance equity and social inclusion (SDG 10) while supporting more liveable and resilient cities (SDG 11).

Energy systems

The energy system is both a major source of pollution and a critical enabler of circular economy transitions in other sectors. Energy is the single largest and fastest-growing source of emissions in Asia and the Pacific, accounting for 52.2 per cent of GHG emissions, due to the region's heavy dependency on coal, which generates 56 per cent of the region's electricity (ESCAP and UNEP, 2024). The population exposed to high levels of air pollution accounts for 33 per cent of the global population, which can be reduced significantly if universal modern energy access is achieved (IEA, 2024). Circular economy actions include scaling renewable energy, improving energy efficiency and closing material loops for energy technologies, such as recycling solar panels, wind turbines and batteries.

Systemic approaches, such as integrating distributed renewable energy with storage, demand-side management and digital grids, enhance system efficiency and resilience. Circular approaches to energy infrastructure reduce future waste and resource bottlenecks as clean energy deployment accelerates.

These interventions reduce air pollutants from fossil fuel combustion, lower CO₂ emissions and limit environmental contamination associated with mining and disposal of energy technologies.

Beyond climate mitigation (SDG 13), circular-economy-oriented energy transitions improve public health (SDG 3), strengthen energy security and create new employment opportunities in renewable energy and recycling industries (SDG 8). A reduced reliance on imported fossil fuels also enhances economic resilience and supports more stable energy access (SDG 7).

Cross-cutting circular economy innovations

Several circular economy innovations cut across provisioning systems and amplify synergies. Eco-design reduces material and chemical intensity at the source. Industrial symbiosis enables waste and by-products from one process to serve as inputs for another, reducing pollution and resource demand. Product-service systems shift business models from ownership to performance, encouraging durability, reuse and maintenance.

Digital technologies such as material tracking, secondary-market platforms and data-sharing across firms are critical enablers, as is collaboration among businesses, municipalities and communities.

These innovations simultaneously reduce material throughput, waste generation and pollution loads across multiple sectors, often with relatively low marginal costs, once systems are established.

Cross-cutting circular economy innovations strengthen progress across SDG 12 (Responsible Consumption and Production) while reinforcing climate, biodiversity, health and economic goals. They also support innovation ecosystems, small and medium enterprise participation and job creation, contributing to inclusive and resilient development pathways.

Taken together, these examples illustrate that pollution reduction and circular economy transitions are most effective when pursued as integrated, synergistic strategies rather than isolated interventions. The following section examines the conditions under which these synergies can be implemented and scaled focusing on finance, data and tools, and governance as critical means of implementation in the Asia-Pacific context.

Table 4.1 Circular economy actions, pollution reduction and synergistic SDG outcomes by provisioning system

Provisioning systems	Circular economy action	Pollution reduction	SDG outcomes
Agrifood	- Food waste reduction - Nutrient cycling - Organic waste valorization	- Nutrient runoff; methane - Plastic waste	SDGs: 2 6 13 14 15
Housing / built environment	- Material efficiency - Retrofitting - Construction waste reuse	- CO₂ - Particulate matter - Landfill waste	SDGs: 3 11 12 13
Mobility	- Modal shifts - Electrification - Shared mobility	- Air pollutants - GHGs - Noise	SDGs: 3 10 11 13
Energy	- Renewables - Efficiency - Recycling of energy technologies	- Air pollutants - CO₂ - Mining impacts	SDGs: 7 8 12 13
Cross-cutting circular economy innovations	- Eco-design - Industrial symbiosis - Product-service systems	- Material flows - Waste streams - Pollution loads	SDGs: 8 9 12

4.3 Case studies

This section presents case studies from across the Asia-Pacific region that illustrate how circular economy interventions have delivered synergistic outcomes

in practice. Each case follows a common structure, tracing how a challenge of material consumption, waste and pollution has been addressed through circular economy actions, generating environmental, social and economic benefits simultaneously.

Table 4.2 Summary of the case studies

Areas of synergies	Synergistic solutions/approaches	Key actors	Enablers
Case study: Advancing a biocircular green rice value chain in Thailand SDGs: 3 8 12 13			
• Air quality • Climate mitigation • Public health • Rural livelihoods • Waste valorization	• Converting rice biomass into value-added products	• National government • Researchers • Farmers • Financial institutions • Industry	• Alignment with national bio-circular-green model • Targeted subsidies • Interest-free loans • Knowledge exchange
Case study: Closing the food-energy loop through the Yokohama Food Recycle Project, Japan SDGs: 7 11 12 13			
• Waste management • Climate mitigation • Urban transport	• Anaerobic digestion and methane fermentation of retail food waste	• Waste generators • Waste transporter • Energy company • Recycling company	• Co-location of waste sources/treatment facilities • Business models returning value to generators
Case study: Improving brick kiln efficiency in Kathmandu Valley, Nepal SDGs: 3 9 13			
• Public health • Air quality • Fuel efficiency	• Replacing traditional Bull's trench kilns with zigzag designs	• National government • Local brick entrepreneur • Engineers • Scientists • Architects • International experts • Partners	• Crisis-driven recovery policies (2015 earthquake) • Visible environmental and financial benefits from fuel savings
Case study: Smart municipal solid waste management in Legazpi City, the Philippines SDGs: 11 12 13 14			
• Urban liveability • Municipal solid waste management • Climate mitigation • Marine protection • Service accountability	• GPS-tracked collection of municipal solid waste and real-time dashboards for route optimization	• Legazpi City leadership • UN-Habitat • Barangay workers • Drivers	• City leadership • Dedicated municipal budget • Auditable diversion data • Frontline worker training
Case study: Extending tyre lifetimes through remote tyre pressure monitoring in Japan SDGs: 3 8 12 13			
• Road safety • Emission reduction • Material longevity • Cost saving	• Business models shifting incentives from product sales to performance • Subscription-based "Tyrematics" sensors to optimize fuel use and extend tyre lifetimes	• Private sector actors (Bridgestone, TRANSTRON, Yazaki Energy and fleet operators)	• Aligning economic incentives with performance • Live data collection and communication
Case study: Scaling up standards for informal waste pickers and junk shops in Thailand SDGs: 1 8 3 11 12			
• Social protection • Safety of informal workers • Poverty reduction • Material recovery quality • Reduction of waste leakage and demand for virgin materials	• National registration database, training on legal frameworks and safety and business development for informal workers	• Waste pickers • Junk shop operators • National government	• Targeted support through training, equipment and institutional reform

Advancing a biocircular green rice value chain in Thailand

Conventional rice production in Thailand causes significant environmental harms: open-field burning of rice residues worsens air pollution, increases GHG emissions and raises public health concerns, while limited value addition restricts farmers' earnings and large amounts of biomass remain underused.

Aligned with the national bio-circular-green economy model, Thailand applied circular bioeconomy principles to the rice value chain. Core actions involved converting rice biomass into value-added products, enhancing collection and utilization to reduce residue burning and developing pathways to carbon-neutral production. Interest-free loans, targeted subsidies and knowledge exchange among researchers, farmers and industry players supported adoption.

Reduced open burning decreased air pollution and health hazards while supporting climate change mitigation. In addition, biomass use generated new products, jobs and income for rural families. The approach also promoted SDG 3 (Good Health and Well-Being), SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action).

Policy alignment within the bio-circular-green economy framework and targeted finance were essential enablers. However, scaling efforts are limited by high biomass logistics costs and tight budgets for processing infrastructure. Ongoing reforms to mechanisms, transparent loan structures and cross-sector collaboration are necessary to fully unlock the model's potential as a replicable example for other rice-producing nations.

Closing the food-energy loop through the Yokohama Food Recycle Project, Japan

Retail facilities in the Yokohama-Kanagawa area generate around 50 tons of food waste per day, yet historically only 40 per cent was recycled, leading to avoidable landfill, incineration and GHG emissions, while local energy systems remained dependent on fossil fuels.

The Yokohama Food Recycle Project (launched in August 2018) uses anaerobic digestion and methane fermentation to convert food waste into biogas for electricity generation. A local circular energy loop allows waste generators to purchase electricity at a discount equivalent to the food waste they supply. Electric collection vehicles are partially charged from this renewable output, closing the waste-energy-transport loop.

By March 2021, the facility processed about 65 tons of food waste per day (approximately 70 per cent capacity), cumulatively reducing CO₂ by over 11,000 tons. Recycling rates at some Japan Rail East retail sites doubled (from 33 per cent to 66 per cent). The project simultaneously delivered renewable electricity, reduced dependence on fossil fuels, lowered waste costs and provided cleaner urban transport.

The co-location of waste sources and treatment facilities, together with a business model that returns tangible value to waste generators were key success factors. Challenges remain around maintaining utilization rates, expanding beyond large commercial actors and adapting the model to cities with more dispersed waste streams.

Improving brick kiln efficiency in Kathmandu Valley, Nepal

Traditional brick kilns in the Kathmandu valley, Nepal are a major source of black carbon and toxic air pollutants. Studies found that up to 95 per cent of residents near kilns suffer from respiratory illnesses, compared to approximately 51 per cent in the broader population (Joshi and Dudani, 2008). The 2015 earthquake damaged much of the valley's kiln infrastructure, creating both urgency and opportunity for rebuilding.

Reconstruction served as a catalyst for replacing traditional Bull's trench kilns with zigzag designs, featuring redesigned chimneys and walls to cut heat loss and enhance combustion. Monitoring devices measured emissions reductions compared to baseline performance.

Although zigzag kilns have approximately 50 per cent higher initial costs, they reduce CO₂ and particulate emissions by 40–60 per cent and cut coal consumption by up to 5 tons per production cycle. This enhances air quality and public health, lowers fuel expenses, boosts kiln resilience and creates benefits aligned with SDG 3 (Good Health and Well-Being), SDG 9 (Industry, Innovation and Infrastructure) and SDG 13 (Climate Action).

Crisis contexts can accelerate systemic change when recovery planning integrates efficiency goals. Technologies with visible environmental and financial benefits, close to established practice, achieve faster adoption. Scaling requires upfront planning for technical support, monitoring capacity and managing higher construction costs.

Smart municipal solid waste management in Legazpi City, the Philippines

Rapid urbanization in Legazpi City increased its municipal solid waste generation to approximately 80 tons per day by 2021, a 36 per cent rise since 2010. Inefficient collection resulted in high fuel use, incomplete coverage and waste leakage into waterways and coastal areas, undermining regulatory compliance and marine pollution targets.

The city deployed a Smart Waste Management System: global positioning system trackers on 12 collection trucks, a web-based real-time dashboard for route optimization, a mobile app for drivers and community (*barangay*)-level worker engagement to validate data. The initiative was delivered in collaboration with UN-Habitat and aligned with the city's Ecological Solid Waste Management Plan, extended producer responsibility law and Nationally Determined Contribution (NDC).

Optimized routes cut fuel use and GHG emissions (SDG 13). Better tracking reduced waste leakage into marine environments (SDGs 11.6, 14.1). Auditable diversion data strengthened extended producer responsibility compliance and governance (SDGs 12.4, 12.5). The combined effect improved urban liveability, environmental protection and service accountability.

City leadership, dedicated budget and frontline worker training were essential. Connectivity gaps in remote *barangays* and high mobile data costs remain limiting factors; offline functionality should therefore be integrated into system design from the outset. Real-time, auditable data can transform waste management from a reactive service into a strategic policy tool.

Extending tyre lifetimes through remote tyre pressure monitoring in Japan

Underinflated tyres in road transport increase rolling resistance, fuel consumption, particulate emissions from abrasion and the need for premature tyre disposal. For fleet operators, poor tyre management also raises safety risks, unplanned downtime and operating costs.

Bridgestone, TRANSTRON and Yazaki Energy developed Tyrematics Real-Time Monitoring: in-tyre pressure sensors connected to digital tachographs and cloud systems that transmit live data to fleet managers and drivers. Delivered via a subscription model bundling tyre supply, maintenance and digital monitoring, this service shifts incentives from product sales to performance.

Optimal tyre pressure cuts fuel use and CO₂ emissions, reduces particulate pollution from tyre wear and extends tyre lifetimes, thereby increasing opportunities for retreading and reuse. Safety and reliability improve, while fleet operating costs fall. The Total Package Plan, a service that offers real-time monitoring as an option, was implemented in approximately 66,000 vehicles by 2023, with targets of 110,000 by 2026.

Subscription models that align economic incentives with performance lowered adoption barriers. Challenges remain in data interoperability across platforms, in extending uptake to smaller fleets and in embedding these services within regulatory frameworks. Solutions combining environmental, safety and cost benefits achieve faster and broader uptake.

Scaling up standards for informal waste pickers and junk shops in Thailand

Informal waste pickers and junk shops play a vital role in plastic recovery across Thailand, but they face unsafe working conditions, limited training and funding, and exclusion from formal systems. This sustains poverty and limits the quality and scale of material recovery necessary for effective implementation of extended producer responsibility.

In Thailand, the Smart Recycling Hub (aligned with the bio-circular-green model and the 13th National Development Plan) project created a national registration database for informal workers, provided training on legal frameworks, safety and business development, and enabled trial implementation across Bangkok, Chonburi, Chachoengsao and Rayong. Participants received weighing scales, safety equipment and certification.

Over 300 waste pickers and junk shop operators received training and equipment, enhancing safety, productivity and income (SDGs 1 and 8). National registration supported gradual formalization and extended producer responsibility compliance (SDG 12). Trained participants are expected to recover approximately 3,000 tons of recyclables annually, reducing waste leakage and demand for virgin materials (SDGs 11 and 12).

National policy alignment and targeted support through training, equipment and institutional reform were crucial enablers. Maintaining long-term engagement, expanding registration systems nationwide and providing appropriate incentives require stable funding, inclusive communication and coordination across government levels. Social protection must be integrated into circular economy strategies, rather than treated as an afterthought.

4.4 Enablers for scaling and replication

Realizing the full potential of synergistic approaches to pollution reduction and circular economy transitions in Asia and the Pacific requires moving beyond isolated projects toward systemic change. While the case studies presented in the previous section demonstrate that synergies are already emerging in practice, scaling and replication depend on enabling conditions that align institutions, incentives, markets and behaviours across provisioning systems (Lambin and others, 2020). Drawing on insights from sustainability science (Swart, Raskin and Robinson, 2002) and the *Global Resources Outlook 2024* report (UNEP, 2024), this section outlines key strategies and measures for embedding synergies into policy frameworks and implementation pathways across the region.

At the core of this approach is the recognition that pollution, waste and resource inefficiency are not sector-specific failures, but system-level outcomes shaped by governance arrangements, investment patterns, trade structures and consumption norms. Scaling synergies, therefore, requires

coordinated action across these dimensions, supported by policy coherence, targeted finance, international cooperation and innovation ecosystems that reinforce circular economy principles.

Institutionalizing governance for synergies

Institutionalizing governance arrangements that connect circular economy strategies with pollution prevention and broader sustainability goals is a key priority for Asia and the Pacific. In many countries, circular economy policies, pollution control measures and development strategies remain fragmented across departments and agencies, hampering policy coherence and limiting the potential for integrated solutions.

Aligning circular economy strategies with frameworks for waste management, air quality, water protection and pollution prevention can help establish a common policy foundation for coordinated action. Inter-ministerial coordination mechanisms, joint targets and shared monitoring systems can support greater alignment across environment, industry, finance, transport and urban development portfolios. At the subnational level, cities and regions play a vital role in integrating actions across sectors, given their key responsibilities in service delivery, infrastructure and pollution management (see Chapter 8).

The main benefit of institutionalized governance is stronger policy coherence (Nilsson and others, 2012). Better alignment across sectors and levels of government can reduce duplication, lower administrative costs and provide clearer signals to investors, businesses and households. This is essential for moving from pilot initiatives to scaled implementation (see also discussion of transformative governance in Chapter 8).

For countries with limited institutional capacity, a practical starting point is a lightweight inter-ministerial working group with a clear mandate to identify policy overlaps and set a small number of shared priorities and indicators within existing planning and budget cycles. This can often be initiated without legislative reform. A shared annual reporting mechanism, even in a basic form, can help maintain coordination and accountability (see also the discussion of tactical governance in Chapter 8).

A key short-term priority is the integration of circular economy and pollution prevention goals into the national development plans or NDCs. This can provide the policy authority needed to support coordination across the government. More formal mechanisms, such as statutory councils or integrated national strategies, may be developed over time as coordination practices and data-sharing arrangements improve.

Political economy factors are also crucial. Coordination may face opposition where ministries see risks to their mandates or budget control. This can be tackled by presenting coordination to lessen administrative workload and enhance policy effectiveness. In many

settings, leadership from finance or planning ministries can be especially influential, given their broad oversight and convening roles.

Financing transitions through aligned incentives

Finance is a critical enabler of the circular economy and pollution reduction efforts. However, existing financial flows often continue to support linear patterns of production and consumption (Dewick and others, 2020). Therefore, scaling synergies requires aligning public and private finance with resource efficiency, pollution prevention and broader social benefits (see Chapter 6). The transition to a zero waste system for household appliances in the Republic of Korea illustrates how reforming these financial flows can successfully redirect materials back into the economy while delivering other significant benefits (Box 4.2).

Key policy measures include internalizing environmental costs through instruments such as pollution charges and extended producer responsibility schemes, reforming environmentally harmful subsidies and mobilizing private investment through blended finance, guarantees and other risk-sharing mechanisms (Braga and Ernst, 2023). Public finance can play an important catalytic role by reducing investment risk for circular infrastructure, retrofitting and innovation, particularly for small- and medium-sized enterprises.

When applied consistently, these measures strengthen the connection between economic incentives and sustainability outcomes. Linking financial returns with pollution reduction and social well-being can motivate firms and households to adopt circular practices, while supporting fiscally sustainable and socially inclusive transitions.

For low- and middle-income countries, a practical first step is to review subsidies to identify public spending that still encourages pollution or linear resource use, including in energy, agriculture and waste management. Redirecting even a small portion of these flows can offer an early and feasible foundation for reform without needing significant new public expenditure. Pilot extended producer responsibility schemes can also act as an effective entry point by signalling policy direction, delivering early results and building institutional experience.

More advanced instruments, such as comprehensive pollution pricing systems or large-scale blended finance facilities, are likely to be more effective once transparency, data and implementation capacity are in place (see Chapter 7). At the same time, financing reform may face resistance from incumbent industries benefiting from existing subsidies, as well as from public finance institutions concerned about fiscal risk. These challenges can be addressed by demonstrating fiscal savings, framing circular finance

as a measure for competitiveness and resilience, and piloting reforms in selected sectors where public and market support is already emerging, such as plastics packaging.

Trade and international cooperation

Trade is a major driver of material use, pollution and waste generation in Asia and the Pacific (Schandl and West, 2010). While international trade has supported economic growth, it has also enabled the relocation of pollution-intensive production and waste burdens across borders (Wiedmann and Lenzen, 2018). Scaling synergies, therefore, requires integrating circular economy and pollution objectives into trade and regional cooperation frameworks.

Priority measures include promoting trade that supports value retention, such as trade in secondary materials, refurbished products and circular services. They also involve strengthening standards and transparency to reduce pollution leakage and the transfer of waste burdens. Additionally, expanding regional cooperation on recycling infrastructure, technology transfer and capacity-building is essential.

These measures can create shared benefits for both producer and consumer countries. By keeping value within material cycles and lowering environmental leakage, countries can strengthen resource security, reduce environmental impacts and boost regional resilience. Cooperation can also help prevent the risk that unilateral measures undermine competitiveness or shift environmental pressures elsewhere.

For many countries, a practical starting point is to participate more actively in existing regional platforms for data-sharing on material flows and waste trade.

This often requires only a designated national focal point and basic reporting capacity, yet can deliver immediate benefits in transparency, coordination and regional engagement. A next step is to support more harmonized standards for secondary materials, building on existing work by regional and international standards bodies. Technology transfer arrangements may be easier to advance through bilateral cooperation initially, before expanding into broader regional frameworks.

More comprehensive approaches, including harmonized environmental trade standards and joint investment in regional recycling infrastructure, are likely to be medium- to long-term goals. Progress will depend on the institutional relationships and trust established in earlier stages of cooperation. In this context, it is important to recognize that trade ministries may see circular economy provisions as a potential restriction on trade or competitiveness. This can be addressed by framing standards for secondary materials as an opportunity to enhance market access, especially in higher-value markets with stricter quality requirements, and by integrating circular economy provisions within existing regional trade frameworks rather than treating them as separate environmental add-ons.

Mainstreaming sustainable consumption

Supply-side measures alone will not be sufficient to achieve large-scale reductions in pollution and resource use. Demand-side strategies that support sustainable consumption are also essential for scaling synergies across provisioning systems (Creutzig and others, 2018). These may include national action plans on sustainable consumption, product standards and labelling, and measures to address marketing practices that encourage overconsumption, especially of resource-intensive and pollution-intensive goods.

Box 4.2 Zero waste household appliances in the Republic of Korea

In the Republic of Korea, waste household appliance disposal was hampered by citizen fees, inconsistent local rules and limited categories under the extended producer responsibility scheme, resulting in a 34 per cent recycling rate and safety incidents due to mixed disposal. To address this challenge, the Government standardized the system by introducing nationwide free collection and recognizing all appliance categories under the EPR scheme. Digital services were scaled for free pick-up requests, supported by a phased rollout involving regional pilots and stakeholder consultations. These reforms generated significant synergies: citizens saved KRW 120.6 billion in fees, while companies enjoyed reduced compliance burdens and recovered 730,000 tons of valuable metals. National recycling targets were met, and GHG emissions fell by 110,000 tons annually, mitigating climate risks. Proactive regulatory reform and consensus-building, and engagement of local governments, producers and citizens, were key enabling factors. Early consensus-building and phased implementation reduced resistance, strengthened policy acceptance and enhanced long-term effectiveness. This case demonstrates that sustained stakeholder engagement and strong government commitment were key to achieving multiple SDGs.

Submitted by the Ministry of Climate, Energy and Environment, Republic of Korea

Behavioural change initiatives, supported by digital tools and public awareness campaigns, can assist consumers in making choices that better align with health, environmental and social objectives. Simultaneously, such measures should be designed with equity in mind, ensuring that sustainable options are affordable and accessible to all groups.

The main synergy lies in the connection between consumer empowerment, reduced overconsumption and enhanced well-being. Aligning consumption patterns with circular economy principles can help minimize pollution and waste while promoting healthier lifestyles and more inclusive development outcomes.

Among the available policy options, green public procurement and mandatory product labelling are often practical and high-impact entry points. Both can be implemented through existing institutional channels and do not rely solely on voluntary behaviour change. Product labelling requirements, including information on recycled content and repairability, can often build on existing product registration systems. Public procurement criteria can also influence market demand directly by using the government's purchasing power to support more circular and less polluting products and services.

Broader behavioural campaigns and restrictions on marketing pollution-heavy goods remain important, but they likely require more time to design, test and implement effectively. National action plans on sustainable consumption can guide strategy but are most effective when integrated into existing sectoral and development planning processes.

Political economy considerations are crucial. Measures in this domain may encounter opposition from consumer goods industries and retail sectors, especially when they appear to limit choice or raise costs. This can be managed by emphasising health and consumer protection advantages, and by ensuring that reforms include strategies to enhance affordability for lower-income groups, including targeted support for sustainable options where appropriate.

Building circular business ecosystems

Scaling and replication also depend on strong circular business ecosystems that can innovate, adapt and grow. Small and medium-sized enterprises are particularly important in this regard, as they are often closely connected to local material flows and service systems, but frequently face barriers related to finance, skills and market access (Kanda, Geissdoerfer and Hjelm, 2021).

Targeted support for small and medium-sized enterprises, innovation partnerships and public-private collaboration can help speed up the adoption of circular solutions. Simultaneously, monitoring systems and data platforms that track material flows, waste and pollution are vital for identifying opportunities, measuring outcomes and building trust among stakeholders.

The main benefit is that circular business ecosystems can create jobs, boost the economy and improve the environment simultaneously. By embedding circular practices into business models and supply chains, countries can cut pollution while also fostering innovation and employment.

For many governments, a practical starting point is to integrate circular economy criteria into existing support programmes for small and medium-sized enterprises and industrial development tools, rather than creating separate funding streams. This can include requirements related to recycled inputs, product take-back or resource efficiency. Such an approach can be implemented within existing policy frameworks and budget lines, while providing early evidence of uptake and impact.

More dedicated instruments, including circular innovation funds, incubators and comprehensive material flow data systems, are likely to become more effective over time as business awareness, institutional capacity and market demand strengthen. Industry associations can play an important enabling role in this process by supporting outreach, skills development and demand aggregation, and by helping to connect small and medium-sized enterprises with circular supply chains and services.

A key implementation risk is that circular economy criteria remain procedural rather than focused on outcomes. To maintain credibility and policy effectiveness, support measures should therefore be accompanied by monitoring frameworks that track material use, waste reduction and pollution outcomes, rather than only the number of firms participating.

Provisioning system-specific actions aligned with International Resource Panel pillars

Scaling synergies requires strategies that reflect the specific characteristics of major provisioning systems, while remaining aligned with the International Resource Panel's emphasis on material efficiency, circularity and sufficiency (UNEP, 2019; 2024).

In food systems, reducing food loss and waste through improved storage, logistics and redistribution can lower methane emissions and pollution while strengthening nutrition and food security (Kuiper and Cui, 2021). In housing and the built environment, retrofitting and more efficient use of materials can reduce emissions and waste while improving affordability and resilience (Bouzarovski, 2016). In mobility systems, sustainable transport strategies can improve air quality and access while reducing congestion and emissions (Lyons, 2017). In energy systems, scaling renewable energy together with circular management of technologies can support decarbonization, energy security and employment (Klemeš and others, 2023).

Across these systems, integrated action can provide multiple benefits simultaneously. This strengthens the argument for synergistic approaches as a practical method for sustainable development in Asia and the Pacific.

At the same time, each provisioning system has its own institutional arrangements and political economy, which influence how circular interventions can be most effectively promoted. In food systems, entry points are often most effective when circular measures are framed in terms of supply chain efficiency, productivity and farmer livelihoods. In the built environment, building codes, public procurement and project appraisal processes provide key levers for encouraging circular material use. In mobility systems, integrating air quality and material efficiency considerations into transport planning and investment appraisal can lead to more consistent outcomes. In energy systems, there is a strong case for incorporating circular management of solar panels, batteries and related technologies into licensing and end-of-life regulations from the outset.

A key priority across all systems is to embed circular economy and pollution prevention criteria into existing sectoral investment, planning and licensing processes. This approach helps to shift incentives across a broad range of decisions without the need for significant new institutional structures. It also produces early benefits, such as cost savings, job opportunities and reductions

in local pollution, which are vital for building and maintaining support for wider structural reforms. Table 4.3 summarizes provisioning system-specific actions and their benefits according to the aspects outlined by the International Resource Panel.

Together, these strategies illustrate how synergistic approaches to pollution reduction and circular economy transitions can be institutionalized, financed and scaled across Asia and the Pacific.

4.5 Key insights and recommended actions

The evidence presented in this chapter demonstrates that pollution reduction and circular economy transitions in Asia and the Pacific are most effective when pursued as integrated, system-level transformations rather than isolated sectoral interventions. Policymakers therefore face a strategic opportunity: to design actions that simultaneously reduce pollution, improve public health, strengthen economic resilience and advance social inclusion. The following key action points translate the chapter's analytical insights into targeted priorities for policymakers operating at local, national, regional and multilateral levels. They also offer a foundation for shaping a credible and ambitious post-2030 Agenda for Sustainable Development.

Table 4.3 Scaling synergies: International Resource Panel aspects, provisioning systems and benefits

Aspects	Systems	Actions	Benefits
Material efficiency and circularity	Food	• Reduce food loss and waste • Nutrient recycling	• Lower methane • Improved nutrition • Reduced water pollution
Material efficiency and circularity	Housing	• Retrofitting • Material-efficient construction	• Lower emissions • Affordable housing • Reduced waste
Material efficiency and circularity	Mobility	• Modal shifts • Electrification • Shared mobility	• Cleaner air • Climate mitigation • Improved access
Material efficiency and circularity	Energy	• Renewable scale-up • Recycling of technologies	• Decarbonization • Energy security • Job creation
Policy coherence and governance	All systems	• Align circular economy and pollution strategies	• Reduced trade-offs • Clearer investment signals
Finance and incentives	All systems	• Redirect subsidies • Mobilize private finance	• Cost-effective transitions • Social co-benefits
Trade and cooperation	All systems	• Value-retentive trade • Regional cooperation	• Reduced pollution leakage • Shared economic gains
Sustainable consumption	All systems	• Action plans • Marketing regulations	• Reduced overconsumption • Health benefits
Innovation and business ecosystems	All systems	• Small-medium enterprise support • Industrial symbiosis	• Jobs • Growth • Lower environmental impacts

Source: Adapted by authors based on review of critical aspects for transition as identified in International Resource Panel (IRP), Global Resources Outlook 2019: Natural Resources for the Future We Want. United Nations Environment Programme (Nairobi, 2019).

Recommendations for national governments

- Focus policy effort on high-impact provisioning systems of food, housing, mobility and energy, where circular interventions deliver the strongest combined gains for pollution reduction, well-being and economic development.
- Empower cities and subnational governments as delivery hubs, with clear mandates, stable finance and technical capacity to coordinate circular economy action across sectors and stakeholders.
- Reorient fiscal and regulatory incentives toward prevention and value retention, including by strengthening extended producer responsibility, removing environmentally harmful subsidies and introducing pricing instruments that internalize pollution costs.
- Adopt integrated monitoring frameworks, moving beyond single-issue indicators to track combined environmental, social and economic outcomes, and enable adaptive, evidence-based policymaking.
- Institutionalize circular economy-pollution synergies in core development strategies, aligning waste, air and water quality, climate, industrial and social policies around material efficiency, circularity and well-being.

Recommendations for local governments

- Focus policy effort on high-impact urban provisioning systems of food, housing, mobility and energy through place-based demonstration projects, living labs and pilot districts where integrated circular solutions can be trialled, evaluated and refined before scaling.
- Establish and support circular hubs and innovation platforms that bring together municipalities, small and medium-sized enterprises, start-ups, universities, informal workers and community organizations to co-develop and prototype circular business models, industrial symbiosis initiatives and low-emission infrastructure solutions.
- Use municipal finance and procurement strategically to de-risk experimentation, providing seed funding, outcome-based contracts and flexible regulatory arrangements that enable circular demonstration projects to move from pilot to mainstream implementation.
- Develop robust local monitoring and learning systems that capture environmental, social and economic impacts of pilot initiatives, enabling iterative improvement, transparent communication of results and structured pathways for replication across cities and provinces.
- Institutionalize experimentation as a fundamental governance role, integrating circular economy-pollution synergies into urban innovation strategies, regulatory

sandboxes and adaptive planning frameworks that enable cities and provinces to trial new models for material efficiency, waste reduction and low-pollution service delivery.

Recommendations for developmental partners

- Prioritize funding for synergistic system interventions, shifting from single-issue pollution projects toward integrated programmes that combine circular economy, climate, health and social objectives.
- Mobilize private finance through catalytic instruments, such as guarantees, concessional finance and performance-based mechanisms that lower risks for circular business models and small and medium-sized enterprises.
- Invest in regional public goods, including material flow and pollution data systems, monitoring methodologies and analytical capacity aligned with International Resource Panel frameworks.
- Position the Asia-Pacific region as a global front-runner, using multilateral platforms to translate regional innovation in circular economy and pollution reduction into globally transferable development models.
- Support upstream policy and institutional reform, including governance alignment, fiscal reform and regulatory capacity-building, alongside investments in physical infrastructure.

Recommendations for regional cooperation

- Coordinate regional responses to shared pollution challenges, such as open waste burning, marine litter and construction-related emissions, explicitly linking them to circular economy solutions.
- Scale and replicate proven national- and city-level initiatives using regional platforms to facilitate peer learning, joint pilots and adaptation across diverse contexts.
- Harmonize regional standards and policy frameworks for circular economy and pollution control to reduce fragmentation and prevent the transboundary displacement of pollution and waste.
- Strengthen regional knowledge and data infrastructure, including shared metrics, analytical tools and training programmes that support consistent implementation and evaluation.
- Use regional cooperation to de-risk investment, developing common project pipelines and blended finance mechanisms that attract private capital into circular infrastructure and services.

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CHAPTER 5

Mobilizing cities as delivery platforms for resilient and synergistic solutions



Key messages

- 1 **Cities are critical platforms for addressing the triple planetary crisis and delivering synergies among the Sustainable Development Goals (SDGs).** Urban areas concentrate climate, pollution and biodiversity challenges, while offering the greatest potential for integrated solutions. Aligning urban systems enables simultaneous progress on emissions reduction, ecosystem restoration and quality of life.
- 2 **Integrated urban planning enables multisector synergies.** Aligning land use, housing, mobility, energy, water, waste and ecosystems within coherent policymaking frameworks generates outcomes that exceed isolated sectoral interventions, advancing climate, resilience and equity objectives.
- 3 **Policy coherence, governance effectiveness and local capacity are critical determinants of sustainable urban resilience outcomes.** Fragmented mandates, limited fiscal autonomy and weak coordination hinders implementation. Strengthening local government mandates, finance and institutional capacity is essential to mainstreaming integrated urban solutions.
- 4 **Finance and data determine the scale of integrated urban action.** Closing financing gaps and strengthening interoperable data systems enable cities to develop bankable projects, attract investment and track multi-benefit outcomes across SDGs.
- 5 **Inclusive approaches and partnerships strengthen urban resilience outcomes.** Community engagement, Indigenous and local knowledge, digital inclusion and cross-city collaboration support more effective and scalable solutions, ensuring urban transitions are both resilient and inclusive.

5.1 Introduction to synergies in cities and urban resilience

With more than 2.2 billion urban residents, cities in Asia and the Pacific are well placed to drive the urban transitions needed to accelerate progress on the Sustainable Development Goals (SDGs) (ESCAP, 2025b). Their large and growing urban population gives them significant influence, but the real strength of cities is in their role as delivery platforms for integrated solutions to sustainability challenges. Across the region, cities are increasingly implementing approaches that address climate change, biodiversity loss and pollution together while advancing resilient, inclusive and low-carbon development. In doing so, cities demonstrate a wide range of pathways that can inform how policymakers deliver on synergies both within and beyond the Asia-Pacific region. This chapter therefore explores how cities in Asia and the Pacific are leveraging synergies to tackle the triple planetary crisis and accelerate progress on the SDGs.

A growing body of data on the urban drivers and impacts of planetary crises highlights the need for synergistic solutions in Asia and the Pacific. For instance, it is estimated that around 11 million metric tons of plastic waste enter aquatic ecosystems each year globally (UNEP, 2021). The Asia-Pacific region is a major source of land-based marine plastic pollution, largely due to rapid urbanization and inadequate waste management infrastructure (Jambeck and others, 2015; Lebreton and others, 2017). Underdeveloped municipal solid waste management systems in rapidly developing cities contribute substantially to plastic leakage into

the environment (ESCAP, 2021). Early estimates further suggest that up to 95 per cent of riverine plastic emissions to the oceans were transported by 10 major rivers, 8 of which are in Asia (Lebreton and others, 2017). In addition, although cities occupy less than 3 per cent of land, they consume a disproportionate share of energy and materials, generate around 70 per cent of global waste, act as hotspots for air and water pollution, and place heavy pressure on ecosystems and biodiversity (IPCC, 2022). At the same time, intensifying hazards such as extreme heat, floods, storms and sea-level rise already threaten people, infrastructure and local economies in cities in the Asia-Pacific region (IPCC, 2022; UN-Habitat, 2024).

Because these sources and impacts are closely interconnected, cities also have significant opportunities for synergies. Since urban areas concentrate land and people, well-designed urban areas can simultaneously reduce emissions, improve air quality, enhance public health, advance social equity and strengthen resilience to climate and environmental risks. There are also several opportunities to leverage this concentration of people and resources to mainstream cross-sectoral solutions into urban planning processes. For example, integrating nature-based solutions (NbS) into urban planning such as urban forests, wetlands and permeable landscapes can help mitigate extreme heat, manage stormwater, restore biodiversity and improve community well-being. A related opportunity involves capitalizing on close connections between city governments and urban residents to promote demand-side solutions such as sustainable mobility and the circular economy (Creutzig and others, 2024). Yet another area with potential for synergies focuses on linking liveability and resilience in

urban planning. For instance, pairing poverty reduction with climate action can build adaptive capacity for low-income groups to extreme heat and flooding. Other opportunities relate to artificial intelligence (AI) and digitalization: linking data, infrastructure and institutions to improve decision-making and service delivery could support broader multi-benefit efforts to expand smart grids and e-permitting (ESCAP, 2024b; 2024a; ESCAP and UN-Habitat, 2023).

Though the impacts and opportunities for synergies are significant in cities in the Asia-Pacific region, they are not distributed uniformly across the region. Due to diverse geographies, demographics, economies and institutional capacities, cities will likely differ in their approaches to synergies. For instance, different cities may need to place varying degrees of emphasis on climate mitigation and adaptation when formulating synergistic solutions. Further, because cities function within wider territorial systems (including secondary cities, small towns, peri-urban zones, rural areas and cross-boundary ecosystems), some synergistic solutions will require working across physical and political boundaries. This is also important because flows of food, water, energy, materials and ecosystem services cross municipal borders, requiring coordinated multilevel policy, planning and finance (OECD, 2020; UN-Habitat, 2019).

Though the impacts and opportunities for synergies are significant in cities in the Asia-Pacific region, they are not distributed uniformly across the region.

Cities are also likely to face several challenges as they work across sectoral and administrative boundaries to achieve synergies in the Asia-Pacific region. Some of these challenges are financial in nature. With 65 per cent of SDG targets relying on local actors, many cities face significant funding gaps that require innovative financing mechanisms. These mechanisms range from green fiscal transfers, credit enhancements, strengthened local revenue, private capital mobilization, blended finance, regional green bonds and land value capture (see Chapter 6) (Basu and Lim, 2024). A related set of concerns pertains to data and technology change. Though e-governance, digital services and AI can help improve connectivity, there is a need for clear safeguards on privacy and rights, as well as participatory data governance to ensure they protect the public interest. Balancing new revenue streams from data centres and AI with rising demands for water and energy in urban areas presents another possible hurdle. A final set of challenges involves capacity limitations and fragmented governance arrangements that can make mainstreaming integrated urban solutions difficult (see Chapter 8).

5.2 Synergistic approaches

Harnessing synergies in cities is about more than simply cost-effectiveness and efficiency; it is about transformative changes that reshape urban development in ways that both improve quality of life and ensure environmental sustainability. Urban systems are well-suited for these kinds of transformative changes because many city-level interventions can reduce emissions, pollution and resource use while also expanding access, inclusion and opportunity. Designed holistically, cities therefore have significant potential to turn interlinked challenges into mutually reinforcing solutions: compact urban form lowers travel and energy demand; clean mobility cuts pollution and inequality; efficient buildings and circular systems strengthen health and resilience; and restored ecosystems enhance biodiversity and climate adaptation. The following five approaches demonstrate how cities can translate this potential into measurable progress, advancing solutions to both the Paris Agreement and the SDGs.

Integrated clean mobility and urban energy systems

Clean transport and decarbonizing power systems offer an important opportunity for urban synergies. Much of that promise reflects examples of interventions that generate mutually reinforcing benefits for climate and health (see Chapter 2). For instance, Shenzhen, China's complete electrification of its bus fleet is already cutting lifecycle emissions and tailpipe pollution while advancing SDG 3.9 on health and SDG 13.2 on climate action (Berlin, Zhang and Chen, 2020; Chen and others, 2021). A related example involves Jakarta's road map to fully electrify TransJakarta by 2030. The road map aligns bus depots with solar installations and grid modernization to support SDG 7.2 on renewable energy as well as other sustainability objectives. Both of these examples could also have even greater effects on energy systems because coordinating charging infrastructure with off-peak and renewable generation prevents new demand peaks that could undermine climate and energy goals (Triatmojo and others, 2024).

Other synergistic solutions extend beyond public to personal transport. Making cities walkable, for instance, lowers pollution levels and improves health. Meanwhile, electrifying two- and three-wheelers, which dominate mobility in many parts of Asia, can drastically reduce urban air pollution and household fuel costs (see also Chapter 2). Here, too, there is also potential for broader effects. To illustrate, integrating electric-mobility policy with building codes, green corridors, parking regulations and renewable energy incentives can maximize system-wide gains.

Effective implementation of integrated transport and clean energy solutions depends on governance alignment between energy and transport authorities. National governments can empower cities through integrated

Box 5.1 Strengthening urban flood resilience through sewage infrastructure upgrades in Seoul

Climate change has increased extreme rainfall exceeding sewage capacity, leading to more frequent urban flooding and greater damage. In August 2022, record levels of heavy rain in the Seoul metropolitan area caused major flooding, including around Gangnam Station. Inadequate drainage maintenance (e.g. clogged inlets) aggravated impacts, while sewer backflow contributed to manhole-related accidents. This challenge was tackled mainly through infrastructure expansion, stronger management standards and public engagement. Key actions included expanding sewers, storage and pump stations across 210 Priority Areas, and deploying deep stormwater tunnels (607,000m³) in constrained downtowns. An active citizen reporting system (25,137 reports; 22,462 addressed) accelerated maintenance and reduced manhole-related risks. This combined approach created synergies such as improving response, reducing safety incidents, and delivering benefits for health and climate adaptation. Central government funding, local implementation and regulatory reforms (maintenance obligations and updated design standards) supported consistent execution, while multi-channel communications helped mobilize citizen participation. With intensifying extreme rainfall, further locally tailored infrastructure is needed, alongside sustainable operation and management financing, systematic performance evaluation, and upgraded flood-risk mapping and modelling beyond design rainfall scenarios.

Source: Submitted by the Ministry of Climate, Energy and Environment, the Republic of Korea.

energy-mobility strategies, public procurement of electric fleets and fiscal incentives for charging infrastructure. Development banks and utilities can expand investment through blended finance and green bonds, while data-sharing between utilities and transport agencies enables predictive planning and efficient grid management.

Digital innovation can also serve as a cross-cutting accelerator. AI-assisted route optimization, predictive maintenance and smart charging systems synchronize transport demand with renewable supply while improving reliability and accessibility. Together, integrated clean mobility and energy systems deliver measurable co-benefits across Good Health and Well-being (SDG 3), Affordable and Clean Energy (SDG 7), Industry, Innovation and Infrastructure (SDG 9), Sustainable Cities and Communities (SDG 11), and Climate Action (SDG 13), creating a pathway for cities to achieve low-carbon, equitable and resilient urban futures.

Efficient, resilient and climate-responsive buildings and infrastructure

The building sector offers significant opportunities to generate synergies between climate mitigation, adaptation and human well-being. Energy-efficient and climate-responsive design reduces peak electricity demand, supports the electrification of transport and enhances resilience to heat, flooding and other climate hazards. The benefits from such shifts are sizable. According to the Intergovernmental Panel on Climate Change (IPCC) (2022), the global building stock could reduce energy-related carbon dioxide (CO₂) emissions by up to 61 per cent by 2050 compared to baseline scenarios, if efficiency measures are combined with electrification, renewable energy, behavioural changes and spatially compact urban development. The benefits

are also potentially wide-ranging and long-lasting. High-performance building codes, the use of green and locally available materials, passive cooling, rooftop solar and green retrofitting can significantly cut emissions while improving comfort and public health (IPCC, 2022). In rapidly urbanizing regions, aligning building standards with energy and land-use planning can prevent the lock-in of high-carbon and high-risk infrastructure over the long term.

Efforts to advance synergies in the building sector can simultaneously enhance resilience. For example, resilient design measures including flood-sensitive zoning, green roofs, natural ventilation and permeable surfaces, reduce heat stress, manage stormwater and enhance ecosystem services in dense urban areas. The co-benefits of these efforts range from lower utility bills for residents, healthier indoor environments, and expanded green jobs in construction, maintenance and retrofitting. In a similar way, as illustrated in Box 5.1 on infrastructure upgrades in Seoul, cities also have ample opportunities to invest in infrastructure that delivers multiple environmental and social benefits.

While these benefits are attractive, realizing them is not guaranteed. For instance, many cities in Asia and the Pacific still lack clear mandates to advance local climate action through building codes. Further, there can also be an absence of robust regulatory and institutional frameworks that establish and enforce performance-based energy and resilience standards for both new and existing buildings. Fortunately, there exists tools that can help cities craft these reforms. The City Enabling Environment for Environmental and Climate Governance framework, for instance, recommends cities adopt supportive legal and policy frameworks, science-policy partnerships and skilled human resources as preconditions for effective local

implementation (United Cities and Local Governments Asia-Pacific, 2023). Building these capacities among local officials, architects and developers is essential to ensure compliance and continuous improvement in building performance. Knowledge-sharing through regional forums and city-to-city networks facilitates the exchange of practical solutions, from climate-responsive design adaptations to resilient infrastructure systems across varied subregions can also help in this regard.

Nature-based solutions for resilient and liveable cities

NbS are arguably the synergistic approach that has attracted the greatest attention in recent years. Part of this appeal reflects the fact that NbS avoids significant capital outlays by preserving and/or restoring existing natural systems. It also stems from the deliberate use of these approaches to manage climate risks, enhance biodiversity and improve urban liveability (Marino and others, 2025). Working across key natural systems can deliver multiple and often intersecting streams of benefits. For example, blue-green networks, comprising wetlands, mangroves, urban forests, parks and permeable landscapes, act as natural buffers that absorb stormwater, reduce urban heat, filter pollutants and provide recreational and health benefits (Frantzeskaki and others, 2019; Sommese, 2024).

The above reasons have led many cities in Asia and the Pacific to adopt a wide range of NbS. Cities ranging from Bangkok, Guangzhou (China) and Singapore, for instance, have worked toward becoming sponge-cities or promoted eco-city programmes that link flood control with the creation of multifunctional green public spaces. These efforts contribute directly to SDG 6 (water and sanitation), SDG 11.7 (accessible public spaces), SDG 13 (climate resilience) and SDG 15 (terrestrial ecosystems), while advancing local well-being and urban attractiveness.

Though NbS hold considerable promise, their effective implementation depends on several factors. That list of factors often begins with robust coordination across water, environment, housing and urban planning sectors. This, in turn, frequently entails embedding NbS principles within regulatory frameworks, investment planning and public procurement systems to secure long-term uptake and maintenance. Mainstreaming NbS into spatial and infrastructure planning can also help support their implementation, for instance, by enabling cities to manage stormwater, urban cooling and biodiversity corridors. Meanwhile, integrating NbS into climate-finance taxonomies and municipal investment portfolios can mobilize resources needed for implementation at scale. At the same time, tools such as ecosystem-service valuation, green and resilience bonds, payment for ecosystem services and insurance-linked instruments can help quantify and reward the protective value of nature, thereby expanding and diversifying funding streams for local governments

(see also Chapter 6). As noted in Chapter 3, integrating cultural heritage and landscape identity into ecological design can reinforce the community connection to place and enhance the social legitimacy of NbS interventions (Dorji and others, 2024).

Circular and regenerative urban systems

Adopting circular and regenerative systems have considerable synergistic potential because they can transform how cities manage materials, water and energy. This transformation will consequently help close loops across production and consumption systems, and turn waste into value. By reducing waste, creating green jobs and cutting emissions from extraction, transport and disposal, circular systems build both environmental and social resilience (see Chapter 4).

Integrating Nature-based solutions into climate-finance taxonomies and municipal investment portfolios can mobilize resources needed for implementation at scale.

Cities across Asia and the Pacific are also choosing different entry points to advance circularity. For many cities, the emphasis is on waste segregation, recycling and organics recovery to reduce landfill methane and generate value-added products such as compost, bioenergy and secondary materials. In other cases, peri-urban agriculture and local food loops improve food security and lower emissions by shortening supply chains, and reusing organic waste and treated wastewater for soil enrichment. Importantly, these actions also have other benefits such as lowering transport-related emissions, improving resource efficiency, diversifying local livelihoods and enhancing urban-rural linkages (FAO and others, 2023; IPCC, 2022). Integrating waste, water and energy cycles, for example, through wastewater-to-energy plants, anaerobic digestion and construction material reuse, is yet another example of how cities can reduce resource footprints and advance climate mitigation. Cities such as Seoul, Singapore and Yokohama (Japan) are just a few of the cities that have aimed to coordinate circular resource flows, offering concrete examples on how to deliver on this potential (UN-Habitat, 2024).

As with many of the other synergistic approaches, an effective circular strategy is not guaranteed but requires supportive reforms. Some of these reforms involve improved logistics such as optimized collection routes, centralized sorting hubs and digital waste-tracking systems, that reduce costs, prevent leakage and strengthen data-driven management. Others involve embedding circular principles into urban planning, investment frameworks and governance systems to encourage cities to transition from linear consumption patterns to regenerative urban economies. Yet another set of changes focus on formalizing the informal waste sector through cooperatives, contracts or social enterprises that enhance safety, livelihoods and accountability. This is essential in many parts of Asia and the Pacific since informal workers are often deeply involved in managing waste and marginalized groups that could benefit greatly from being recognized for their contributions.

Integrated spatial and territorial planning for connected urban systems

Integrated spatial and territorial planning redefines how cities grow by aligning urban development with the wider functioning of regions. This kind of planning connects land use, housing, mobility, infrastructure and ecosystem management across spatial scales, linking compact, mixed-use and transit-oriented neighbourhoods with peri-urban and rural systems. Working across these boundaries can curb sprawl, reduce emissions and strengthen the flows of energy, food, water, materials and services that sustain both urban and rural communities.

Spatial planning can also reinforce many of the previously covered synergistic solutions. For instance, compact, mixed-use development near high-capacity public transport can make transport systems more sustainable by reducing vehicle kilometres travelled, energy demand and air pollution while improving access to jobs and services. Transit-oriented development, an approach that involves a deliberate attempt to co-locate multiple sustainable modes of transport around commercial areas, is gaining traction in South-East Asia as a way to achieve synergies. More concretely, experiences from Bangkok, Jakarta and Singapore demonstrate that aligning land use with mass transit can lower emissions, expand affordable housing and enhance walkability when complemented by safeguards such as inclusionary zoning, affordable housing quotas and tenant protections to prevent displacement (ESCAP, 2025a). The effects from these changes are measurable and significant: the Intergovernmental Panel on Climate Change (IPCC) (2022) suggests that integrated spatial planning that promotes compact, resource-efficient and transit-oriented urban growth could reduce urban greenhouse gas (GHG) emissions by 23–26 per cent by 2050 relative to the business-as-usual development pathway (IPCC, 2022).

A territorial perspective that extends planning beyond municipal boundaries is another way that involves working across and then beyond the city to achieve synergies. Regional frameworks that connect cities with their hinterlands are a good example of such an approach; these frameworks can enable balanced development, equitable access to resources and shared management of natural assets. Strengthening urban-rural linkages through circular flows of energy, food and materials promotes local self-reliance and livelihoods and are another illustration of an approach that moves across space. Enhancing these linkages through coordinated watershed and ecosystem management can build resilience to floods, droughts and heat. Managing problems that cut across transboundary urban areas, such as inter-urban corridors or state border zones, is yet another area with synergistic potential. That potential reflects the fact that biogeochemical cycles, air pollutants and biodiversity corridors transcend administrative boundaries.

When it comes to spatial planning, many of the complementary reforms needed to realize synergies and prevent cities from shifting rather than solving environmental burdens involve adopting collaborative, cross-sectoral and cross-jurisdictional governance (Alam and Nurhidayah, 2017; Nurhidayah, Lipman and Alam, 2014). For example, there is often a need to strengthen multilevel coordination, through metropolitan forums or cross-city bodies supported by national governments (Creutzig and others, 2024; Varkkey, 2022). Revising legal and planning frameworks to be more place-based, reflecting functional linkages between cities and surrounding villages can often complement these multilevel reforms (Umar and Kurrahman, 2022). Mainstreaming integrated river-basin management into urban spatial planning and establishing cross-border protocols can further strengthen these institutional changes (Alam and Nurhidayah, 2017; Don Ramli and Hashim, 2020). Cross-boundary cooperation, through inter-municipal planning bodies, metropolitan authorities, or river basin organizations, exemplify another set of supportive governance reforms (see Chapters 3, 7 and 8 for similar insights).

5.3 Case studies

Cities in Asia and the Pacific are central to addressing the interconnected challenges of climate change, biodiversity loss, pollution and growing socioeconomic inequality. As highlighted in previous sections, there are many approaches to advancing synergistic solutions that simultaneously accelerate progress on the Paris Agreement and the SDGs. However, realizing this potential requires concrete examples of how cities in the region are working across governance levels, sectors and stakeholders. The following case studies illustrate how cities are delivering synergies through a range of approaches.

Table 5.1 Summary of the case studies

Areas of synergies	Synergistic solutions/approaches	Key actors	Enablers
Case study: Addressing urban air pollution, public health and climate change in Jakarta SDGs: 3 7 11 13 17			
• Air quality management • Public health protection • Sustainable urban mobility • Energy transition • Metropolitan environmental governance • Climate mitigation	• Expansion of traffic demand management policies • Strengthening vehicle emissions testing and enforcement • Investment in mass public transport systems • Tightening national air quality standards • Regulatory measures targeting emissions from coal-fired power plants and industrial sources • Data-driven pollution source apportionment	• Provincial Government of Jakarta • National Government of Indonesia (Ministry of Environment and Forestry, Ministry of Transportation, Ministry of Energy and Mineral Resources) • Metropolitan and neighboring provincial authorities in Greater Jakarta • Civil society organizations and citizen advocacy groups • International partners	• Judicial intervention through the 2021 clean air court ruling strengthening government accountability • Growing public awareness and civic engagement • Expansion of public transport infrastructure • International technical support • Policy coordination across sectors
Case study: Integrating climate-resilient and low-carbon land use in the Santa Rosa-Silang sub-watershed, the Philippines SDGs: 6 11 13 15 17			
• Integrated climate change adaptation and mitigation • Flood resilience • Biodiversity • Watershed land-use planning and governance	• Basin-scale participatory land use management approach • Participatory GIS mapping and scenario analysis • GIS-based hydrological modelling • Collaborative planning workshops • Aligning ecological strategies with institutional mechanisms	• Local government units in the Santa Rosa-Silang sub-watershed • Academic and research institutions • Laguna Lake Development Authority • Local communities	• Strong academic-government partnerships • Policy mandate for 5-year plans • Combined use of scientific tools and participatory methods
Case study: Circulating and ecological sphere approach for resilient cities and regions SDGs: 2 3 6 7 8 11 13			
• Strengthening urban-rural linkages through optimal resource circulation • Decarbonization • Ecosystem conservation • Economic revitalization • Community well-being	• Mapping the resource flows across urban-rural continuum • Geospatial mapping and scenario analysis • Multi-stakeholder consultations and workshops • Co-design and co-development of action plans	• Local government • Private and business sector • Civil society • Academic and research institutions • Development agencies	• Integrated policy planning • Local stakeholder engagement and partnership-building • Mutual learning • Capacity development • Regional cooperation
Case study: Bridging the digital divide in Sri Lanka via the e-Sabha digital complaint application SDGs: 5 11 16 17			
• Social inclusion • Urban planning and governance • Digital transformation	• Mobile app-based governance platform links multiple urban priorities	• Asia Foundation • Local government authorities of Sri Lanka • Department of Local Government (Southern Province) • HELP-O (civil society)	• Social inclusion; transparency and accountability of public service • Community watchdog groups; • Local government authorities

Pollution, public health and climate mitigation in Jakarta

As the capital of Indonesia and one of the world's largest metropolitan areas, Jakarta is exposed to the kinds of severe air pollution challenges facing many cities in the Asia-Pacific region. With over 30 million residents in the Greater Jakarta area, the city consistently records some of the highest fine particulate concentrations globally; these concentrations can be up to three times national air quality standards (Firdaus and others, 2023). Exposure to this pollution is linked to over 10,000 premature deaths and thousands of hospitalizations each year, costing around 2 per cent of the province's gross domestic product (GDP) through lost productivity and health expenditure (Firdaus and others, 2023). Air pollution also affects quality of life and economic activity, and long-term exposure is projected to shorten life expectancy, prompting growing public concern and a 2019 citizen lawsuit demanding government action (Lamb and Costa, 2021a).

Jakarta's air pollution stems from overlapping local and regional sources, with land transportation and fossil fuel combustion as the primary contributors. The transport sector alone accounts for roughly two-thirds of fine particulate emissions, largely from private and ageing vehicles that dominate the city's roads (Firdaus and others, 2023). Industrial facilities and coal-fired power plants in surrounding provinces add significant sulphur dioxide and nitrogen dioxide emissions that form secondary particles and surface level ozone (Firdaus and others, 2023). Seasonal patterns exacerbate the problem: during the dry season and El Niño episodes, weak winds and limited rainfall trap pollutants over the city (Firdaus and others, 2023). These combined factors make Jakarta a regional hotspot for pollution, requiring coordinated, cross-sectoral solutions.

Following the 2021 court ruling that held the national and local governments responsible for failing to protect citizens' right to clean air, Jakarta has accelerated the adoption of policy responses (Lamb and Costa, 2021b). Measures include expanding the odd-even traffic restriction policy, strengthening vehicle emission testing and investing in mass transit systems such as the mass rapid transit, light rail transit and TransJakarta bus rapid transit. The government has also tightened national air quality standards and taken steps to regulate nearby coal-fired power plants. Importantly, many of these efforts not only improve air quality but reduce GHGs. Collaborative initiatives, such as the Clean Air Catalyst programme led by the World Resources Institute Indonesia and the United States Agency for International Development are helping identify key pollution sources and promote science-based solutions that can deliver these co-benefits (Firdaus and others, 2023). Sustained implementation and coordination across Greater Jakarta remain essential, but recent actions and civic engagement suggest that cleaner air, improved health and decarbonized development is possible.

Integrating climate-resilient and low-carbon land use in the Santa Rosa-Silang sub-watershed, the Philippines

Since the 1990s, the Santa Rosa-Silang sub-watershed, encompassing the cities of Santa Rosa, Cabuyao and Biñan, and the municipality of Silang, in the Philippines, has faced increasing environmental pressures due to rapid urbanization and industrialization (Magcale-Macandog and others, 2011). To reduce these pressures and mainstream climate adaptation and mitigation into local development planning, a project was implemented that adopted a basin-scale participatory land-use management approach. The project involved using participatory geographic information systems mapping and scenario analysis, risk assessment involving hydrologic modelling (using climate scenarios) and collaborative planning workshops to update the region's comprehensive land-use plans and other local development plans.

The cities that were the focus of the project are located in the downstream areas that have undergone massive conversion of agricultural lands into built-up areas. The resulting increase in impermeable surfaces has diminished the watershed's capacity to retain water, making it more vulnerable to flooding and soil erosion. Intensifying rainfall has exacerbated these impacts, while urban expansion has also generated significant pollution from industrial, commercial and residential waste. Local government officials acknowledge that these shared challenges transcend political boundaries, underscoring the need for a harmonized land-use plan at the sub-watershed level (Endo and others, 2017).

Addressing these challenges has required a holistic or synergistic approach to land-use planning that integrates ecological conservation with governance mechanisms across administrative borders. Conservation of forests and agroforestry systems in upstream areas, coupled with the preservation of green spaces in midstream zones, are expected to enhance water infiltration, recharge aquifers and reduce flood risks (Magcale-Macandog and others, 2017). Riparian restoration is anticipated to stabilize riverbanks, mitigate erosion, restore native fauna and improve biodiversity. The Laguna Lake Development Authority has also supported these efforts, enforcing the 'polluters pay' principle to reduce industrial and chemical discharges into rivers and the Laguna Lake. The Santa Rosa-Silang sub-watershed case study has addressed multiple SDG targets including 11.b, 11.5, 6.5, 13.1, 13.2, 15.1 and 15.9. By aligning ecological strategies with institutional mechanisms, cross-boundary watershed governance offers pathways for climate resilience and sustainable urban development.

Circulating and ecological sphere approach for resilient cities and regions

While traditional urban-centric development strategies often overlook the potential of urban-rural connectivity, the circulating and ecological sphere (CES) approach offers a multiscale and multidimensional approach to maximize the vitality of all regions through sustainable, equitable and efficient use of locally available resources across mountainous, agricultural and fishing villages as well as cities. Developed through deliberations on the fifth and sixth Basic Environment Plan in Japan, CES offers a transformative approach to integrate urban cores, peri-urban zones and rural hinterlands into functional city-regions, where resources, services and knowledge circulate in both directions. By encouraging cities and their surrounding regions to collaborate on resource circulation, decarbonization, ecosystem conservation, economic revitalization and community well-being, CES gives rise to self-reliant, decentralized and sustainable societies (Ortiz-Moya and others, 2021; Takeuchi and others, 2019).

At its core, the CES approach recognizes that rural areas supply cities with food, clean water, biodiversity habitats and carbon sinks, while urban centres provide higher-order services, innovation, finance and infrastructure. By explicitly mapping and reinforcing these flow of goods, services, energy, ecosystem services and knowledge, the notion of CES strengthens regional resilience, reduces resource dependency and strengthens rural livelihoods. Within the city-region territories, integrated policies on diverse sectors of mobility, water, food and natural resource flows as well as risk exposure can stimulate synergistic actions on sustainability and climate change. For example, Marome and others (2022) applied the CES approach to the Udon Thani city region in Thailand for enhancing water and food security, mobility and urban-rural cooperation. Moreover, in the case of Hingna Tahsil in Nagpur, India, the CES reduced rural vulnerability during the COVID-19 pandemic. Likewise, a growing number of studies are underscoring the significance of CES application towards achieving resilient city-regions (Chen and others, 2026).

To further advance research and capacity on utilization of the CES concept, the Institute for Global Environmental Strategies, START International, Inc., together with several leading academic and research institutes in South and South-East Asia, have established the CES-Asia Consortium (Mitra and others, 2024). This initiative can be leveraged for advancing action-oriented solutions. By operationalizing CES, policymakers can capitalize on urban-rural linkages to create resilient, low-carbon, and inclusive regions. The approach also offers a practical pathway for cities and their surrounding regions to work together, turning connectivity into a strategic tool for sustainable development and climate action across the Asia-Pacific region.

Bridging the digital divide in cities across Sri Lanka using the e-Sabha digital complaint application

Galle Municipal Council, a tourist destination in the south of Sri Lanka, took advantage of digital transformation to combine resident complaint services into one integrated application. E-Sabha is a simple and inexpensive application that improves urban governance by putting city residents and officials from various government agencies in conversation on a single platform. The e-Sabha app works by having registered users from the city submit complaints under specific categories such as road status, improper waste management, malfunctioning streetlights, etc. They can add a description of the issue and attach photo evidence. The issue then goes to the relevant division in the local government, and the status of the complaint is tracked in real-time on the open platform. Users can see how and when the problem was resolved and provide feedback on the service. The city council and civil society groups collaborated to run workshops to help key sectors of the urban population to download and begin using the application.

Galle Municipal Council, a tourist destination in the south of Sri Lanka, took advantage of digital transformation to combine resident complaint services into one integrated application.

While initially developed simply as a method to lodge complaints, the application has now grown to serve as a public information service platform to send public notices to residents. The application also facilitates efficient data collection and analysis which supports evidence-based decision-making in regional development planning. Accordingly, its capabilities to consult the public on new planning initiatives is being further developed as the data that has been compiled has been a breakthrough for city planners to improve service delivery. The app directly addresses SDG 16.6 to create effective, accountable and transparent public institutions but can also improve waste management, urban service delivery and public participation. Similar apps can be launched in most urban centres in the Asia-Pacific region and customized to fit the local culture.

5.4 Enablers for scaling and replication

Transforming cities from sources to solutions of multiple crises requires well-designed enabling environments. The following section outlines the financial, data and governance enablers needed to deliver, scale and sustain synergies in cities in Asia and the Pacific.

Financial system transformation

Expanding access to finance and reforming fiscal systems are prerequisites for scaling synergies within and beyond cities. Cities can diversify revenue streams and attract investment through green and resilience bonds, land-value capture and climate-linked municipal funds. National finance ministries can establish green investment facilities and results-based fiscal transfers to incentivize local sustainability outcomes. Nevertheless, own-source revenue generation is also critical, especially for small projects or continuous implementation.

Private capital mobilization through PPPs and blended finance can scale clean infrastructure while sharing risk. Climate-aligned procurement and transparent pipelines of bankable projects with multiple benefits strengthen investor confidence. International development partners can further de-risk investment by supporting city creditworthiness and pipeline development (see Chapter 6 for further elaboration on these mechanisms).

Innovation in financial instruments such as insurance-linked securities, carbon pricing revenues and ecosystem-service payments, can channel resources toward resilience and ecosystem protection. Financing frameworks should emphasize inclusion, ensuring that low-income communities are not left behind but rather benefit from infrastructure investments through targeted subsidies or social housing components.

Data, digitalization and monitoring

Robust data systems and digital technologies are essential to managing complex urban systems and measuring progress on multiple sustainability challenges. Digital transformation enables real-time decision-making, transparency and service efficiency. Smart city dashboards, global information systems-based monitoring and e-governance platforms enhance accountability and enable adaptive management of interlinked climate and SDG actions (see Chapter 7).

Enabling this integration also requires narrowing persistent digital divides between and within countries, across gender and age groups, and between large and small cities. Bridging these gaps through affordable connectivity, digital literacy and inclusive design is essential to implementing and scaling synergies.

Cities can promote open data, multilingual interfaces and community innovation hubs to democratize access and demonstrate the multiple benefits of their actions.

Interoperable data standards linking local, national and regional systems allow better alignment of urban planning, finance and resilience indicators. Regional initiatives that help to harmonize data collection, share tools like digital twins and enable joint learning can help in this regard. As also noted in Chapter 7, monitoring frameworks that track co-benefits can build support for investments that improve health or preserve biodiversity.

Integrated and inclusive governance and capacity-building

Scaling synergies and transforming urban systems often requires integrated, inclusive, adaptive and capable governance. Many local governments still face fragmented mandates, limited technical expertise and weak coordination across departments that runs counter to these needs. Integrated climate action plans linked to local development and spatial strategies that translate national visions into local actions offers a starting point for addressing these gaps. Requiring cities to mainstream resilience and decarbonization principles across sectoral regulations, from green building codes and transit-oriented zoning to circular waste management and renewable energy mandates, can also strengthen support for synergies. Cross-agency coordination mechanisms, such as councils for resilient cities or urban-climate taskforces, can also help align transport, housing, energy and environment divisions under a shared planning framework. Meanwhile, strengthening institutional capacity through professional training, peer-learning networks and partnerships with universities to bridge science and policy can help close knowledge gaps and strengthen the evidence-based foundation for synergies (see Chapter 8).

Integrated governance is not all that is needed to scale synergies. People-centred and participatory governance is also critical to increasing bottom-up support synergies and promoting replication. Cities that engage communities in planning, implementation and monitoring, as demonstrated by participatory climate plans in Seoul and waste-bank initiatives in Indonesia, achieve higher ownership and more visible results. Promoting participation in decision-making aligns with SDG 16 and SDG 17, and ensures that marginalized groups, women and youth are active partners in multi-stakeholder urban transitions. This also often requires working across conventional boundaries, for instance, establishing multi-stakeholder coordination bodies and inter-municipal councils to foster coherence across metropolitan areas and strengthen accountability. Forming partnerships with local academia, civil society and community organizations can further strengthen the basis for evidence-based decision-making that is responsive to local needs (see discussion of tactical governance in Chapter 8).

Regional and multilevel cooperation

Urban sustainability challenges, from transboundary haze to shared river basins, transcend municipal and even national borders. Strengthening vertical integration (linking local action with national strategies) and horizontal cooperation (among cities and regions) is critical to scaling synergies.

Regional bodies such as the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and subregional organizations such as the Association of Southeast Asian Nations (ASEAN) can play a supportive role in this regard. Regional financial institutions, including the Asian Development Bank (ADB), can further catalyse implementation by supporting regional investment platforms and by financing cross-border initiatives through relevant programmes. These mechanisms can enable coordinated policy action and blended financing that demonstrate integrated and climate-resilient development in practice, including transboundary watershed management across the Mekong and Ganges-Brahmaputra basins.

At the same time, regional, inter-municipal and citizen cooperation is vital to coordinate waste and resource management infrastructure, align standards and develop secondary material markets. Regional platforms, such as ESCAP's Circular Economy Hub and ASEAN's Circular Economy Framework, support knowledge exchange, harmonization of standards and access to finance for local governments and small and medium-sized enterprises.

City-to-city networks can also play a role in advancing peer learning and scaling successful synergistic initiatives. Supported by platforms such as the United Cities and Local Governments Asia-Pacific, ICLEI – Local Governments for Sustainability and CityNet, these networks enable local leaders to exchange solutions, access technical expertise and build institutional capacity. They also connect small- and medium-sized cities to financing opportunities through partnerships with the Global Covenant of Mayors for Climate and Energy, the C40 Cities Finance Facility and the Resilient Cities Network, thereby helping to scale innovation, strengthen governance and accelerate implementation of the SDGs across the region.

Further, such regional collaboration can drive policy. For instance, in preparation for the second Global Stocktake (GST) at COP33, preparing and disseminating an ASEAN-Japan GST report to accurately reflect the efforts, technologies and ideas of Japan and ASEAN, and reflect them in the COP negotiations could showcase the region's leadership in aligning urban decarbonization with economic growth.

5.5 Key insights and recommended actions

This section outlines strategic recommendations to strengthen the enabling environment for integrated urban resilience and accelerate the delivery of synergistic solutions. The recommendations are structured across four groups: national governments, local governments, development partners and regional institutions. Together, these groups play complementary roles in aligning policy frameworks, mobilizing finance, strengthening institutional capacities and facilitating knowledge exchange. By advancing such multilevel and multi-stakeholder coordination, countries in Asia and the Pacific can transform cities into engines of resilient, low-carbon and inclusive development while unlocking co-benefits across multiple SDGs.

Recommendations for national governments

- Integrate measurable urban resilience and climate-biodiversity-pollution indicators into national development strategies, Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), National Biodiversity Strategy and Action Plans (NBSAPs), and SDG reporting frameworks, ensuring that urban systems are explicitly reflected in national targets and monitoring mechanisms.
- Enact national resilience legislation that defines clear local government mandates for risk-informed urban planning, ecosystem protection, pollution control, data-sharing and equitable access to climate finance, with accountability mechanisms for implementation.
- Establish a coordinating body on city resilience to align key ministries (environment, housing, transport, energy, finance, planning) under shared resilience and decarbonization targets, supported by integrated budgeting and cross-sectoral performance frameworks.
- Issue national policy guidelines, regulatory standards and fiscal incentives to accelerate the adoption of NbS, circular economy solutions, climate-responsive buildings and low-carbon infrastructure at the subnational level.
- Strengthen fiscal decentralization frameworks by expanding predictable, formula-based intergovernmental transfers linked to resilience performance, results-based budgeting and measurable SDG-aligned urban outcomes.

Recommendations for local governments

- Implement integrated urban and territorial plans that align land use, housing, transport, energy, water and waste systems under a city resilience master-plan consistent with SDG 11 (Sustainable Cities and Communities), NDCs, NAPs, Local Biodiversity Strategy and Action Plans (LBSAPs) and national urban policies. These plans should explicitly identify cross-sectoral co-benefits and trade-offs.

- Establish multisectoral resilience coordination mechanisms under the mayor's office or the equivalent executive authority to align departments, synchronize budgets, monitor performance indicators and engage communities and the private sector in implementation.
- Mandate risk-informed and future-oriented planning, including climate-risk screening, ecosystem impact assessments, pollution inventories and long-term natural resource forecasting for all major infrastructure projects and zoning decisions.
- Embed NbS, circular economy standards and energy-efficiency requirements into building codes, urban design regulations, procurement systems and public investment frameworks, with measurable green-blue infrastructure targets and resource efficiency benchmarks.
- Create formal urban-rural coordination mechanisms to jointly manage shared ecosystems and resource flows such as watersheds, coastal zones, food systems, energy corridors and biodiversity networks, ensuring functional territorial integration beyond administrative boundaries.

Recommendations for development partners

- Align urban financing with integrated climate-biodiversity-pollution outcomes rather than sector-specific investments.
- Expand blended-finance instruments, credit enhancement mechanisms and pooled financing models to support secondary and small cities.

- Support long-term institutional capacity-building, including technical training and science-policy partnerships in cities.
- Develop standardized methodologies to measure cross-SDG co-benefits from urban investments.
- Prioritize support for project preparation, municipal creditworthiness enhancement and pipeline development over stand-alone pilot projects.

Recommendations for regional cooperation

- Harmonize regional standards and guidelines for integrated urban resilience strategies.
- Facilitate cross-border ecosystem governance for shared river basins, coastal zones and transboundary airsheds.
- Develop harmonized regional data frameworks and interoperable indicators to monitor urban climate, biodiversity and pollution synergies, alongside risk exposure, hazards and social vulnerabilities, enabling consistent measurement of co-benefits and resilience outcomes across countries.
- Expand city-to-city peer learning mechanisms focused on implementation, replication and scaling of integrated urban resilience solutions.
- Convene regional investment matchmaking platforms linking cities with climate finance, green bonds and technical assistance.
- Align regional investment facilities and technical assistance programmes with integrated climate-biodiversity-pollution priorities to accelerate cross-border learning and collective action.

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CHAPTER 6

Leveraging synergistic finance to maximize co-benefits



Key messages

- 1 **Emerging and developing economies in the Asia-Pacific region face a climate financing gap of approximately US\$ 800 billion annually.** Closing this gap requires finance structured to deliver co-benefits across climate, biodiversity and pollution objectives, and a concerted effort to make deeply fragmented financing flows more coherent.
- 2 **Two main approaches exist to synergistic finance or finance that generates co-benefits across multiple sustainability domains.** Finance-driven approaches rely on the structure of the financial mechanism itself, through its incentives or regulatory requirements, to actively generate co-benefits. In contrast, finance-enabling approaches depend on well-designed projects to deliver these benefits, with finance playing a supportive rather than a driving role.
- 3 **Synergistic financing can also increase transaction costs, extend preparation timelines and create coordination challenges.** However, these trade-offs can be addressed through regulatory reforms, cost reductions and payment-for-performance structures that align incentives. Leveraging existing partnerships can also lower transaction costs for stakeholders from different parts of the financial sector.
- 4 **Well-designed public, private and blended finance mechanisms can generate synergistic outcomes.** However, these instruments often remain underutilized due to fragmented mandates, limited institutional capacity and weak market incentives for integrated investment.
- 5 **Lessons learned from Fiji, India, Indonesia and Viet Nam show that synergistic financing is feasible when trade-offs are understood and managed.** Experiences from these and other countries demonstrate that pipelines of investible synergistic projects exist. Yet, there is a need to strengthen enabling environments, voluntary frameworks and financial ecosystems for the private sector to invest in that pipeline.
- 6 **Scaling synergistic finance requires strengthening policy coherence, inter-ministerial coordination, integrated finance strategies and targeted support from development partners.** Developing multi-objective investment frameworks, expanding blended finance platforms, building capacity for integrated appraisals and creating market incentives for nature-positive and pollution-reducing investments can all help in this regard.

6.1 Introduction to finance and synergies

The triple planetary crisis of climate change, biodiversity loss and pollution threaten not only the global environment but the global economy. International agreements, such as the Paris Agreement and the Kunming-Montreal Global Biodiversity Framework (KMGBF), increasingly call for decision makers to recognize this crisis' interrelated causes and consequences to reduce this threat. Recognizing these interrelationships can support a much-needed shift in how finance is mobilized and deployed, thereby helping to close funding gaps (OECD, 2024b).

Closing these gaps is particularly important in the Asia-Pacific region. Not only do many parts of Asia and the Pacific suffer from and contribute to climate change, biodiversity loss and pollution, but fragmented financing has limited how effectively funding has addressed these challenges. Between 2018 and 2019, for instance, the Asia-Pacific region mobilized approximately \$519 billion in climate finance (\$225.6 billion in 2018 and \$294.3 billion in 2019). While this amount demonstrated a growing commitment to address climate change, the figure fell far short of the estimated needs for mitigation,

adaptation, biodiversity conservation and pollution control (ADB, 2024). The OECD (2025b) provides another perspective on this funding shortfall: bilateral and multilateral official climate finance provided to the Asia-Pacific region grew from \$6.8 billion in 2012 to \$22.8 billion in 2023. However, even the total \$150 billion mobilized over a cumulative ten-year period between 2012–2023 (averaging \$12.5 billion annually) was less than one-quarter of a single year's financing need. In fact, emerging and developing Asia-Pacific economies require at least \$1.1 trillion annually through 2030 to meet the commitments under the Paris Agreement. At present, the gap between this \$1.1 trillion annual need and actual resources for climate change is approximately \$800 billion per year (Basu and Lim, 2024).

Closing this gap would be easier if financing mechanisms motivated decision makers to integrate climate action with nature conservation and pollution reduction to deliver synergies through an approach referred to in this chapter as "synergistic finance". Synergistic finance refers to financing mechanisms that yield climate, biodiversity, pollution reduction and other co-benefits. These multi-benefit outcomes can be generated through various financing modalities, including public finance (regulatory mandates and sovereign instruments),

private finance (market-based pricing) and blended finance (risk allocation structures). These outcomes also tend to flow through two main approaches. On the one hand, finance-driven approaches rely on the structure of the financial mechanism itself, through its incentives or regulatory requirements, to actively generate co-benefits. On the other, finance-enabling approaches depend on well-designed projects to deliver these benefits, with finance playing a supportive rather than a driving role. In both cases, synergistic finance improves the efficiency and returns on investment while making some investments more commercially viable. Synergistic finance also encourages governments, investors and other stakeholders to collaborate across different sustainability domains and achieve outcomes greater than the sum of their individual parts (following definitions of synergies in Chapter 1).

Global financial flows

A reason why synergistic finance is needed globally is the fragmentation and shortage of resources to address the triple planetary crisis. This shortage is evident even in climate financing, where resources have increased significantly in recent years. To illustrate, global climate finance increased from \$812 billion in 2018 to \$1.9 trillion in 2023, with private climate finance surpassing public finance (table 6.1). However, meeting the objectives of the Paris Agreement requires more than doubling the total of recently allocated resources to at least \$4.1 trillion annually by 2030 globally. A similar challenge exists with climate finance from developed to developing countries. Though the exchange of that finance reached \$115.9 billion in 2022—exceeding the \$100 billion annual target—financing needs continue to grow. In fact, developing countries require \$2.2 trillion annually to address climate change and \$3–\$4 trillion annually to achieve the Sustainable Development Goals (SDGs) (OECD, 2025d).

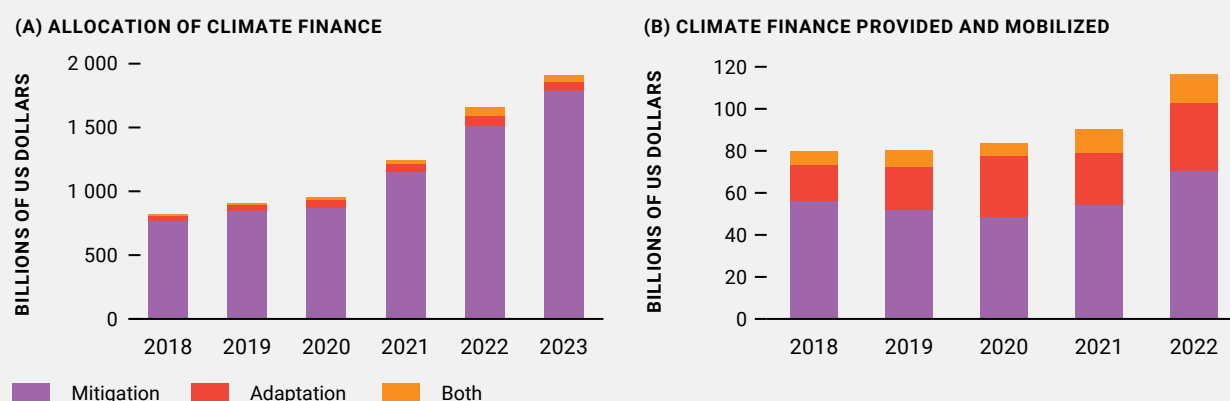
A related reason why synergistic finance is needed is the imbalance in funding allocated to address different environmental challenges. For instance, when it comes to climate change, global mitigation finance was 27 times higher than adaptation finance in 2023 (\$1,781 billion compared to \$65 billion) (figure 6.1) (Naran and others, 2025; OECD, 2024a; 2024b; 2025b). Meanwhile, biodiversity-related development finance amounted to only \$25.8 billion in 2022, representing less than 2 per cent of climate finance. Total global finance flows for nature-based solutions (NbS), including the protection of biodiversity and landscapes as well as sustainable agriculture, forestry and fishing, wastewater management and pollution abatement, were substantially higher than standalone biodiversity finance at \$200 billion. However, even this larger NbS investment represents less than half of the estimated \$542 billion required annually to achieve globally agreed climate, biodiversity and land degradation targets related to NbS by 2030 (UNEP, 2023). Finally, though there has been an upward trend in funding for the circular economy, Asia accounted for only 13 per cent (\$3.6 billion) compared to 57 per cent (\$15.5 billion) in Europe. This suggests significant untapped potential for circularity as one of the more effective integrated approaches in the world's most populated region (table 6.1).

The kinds of instruments available to address these needs in different regions raises another set of concerns. For instance, data suggests that loans accounted for \$63.6 billion versus grants amounting to \$25.6 billion (a ratio of 2.5:1) in 2021–2022, increasing debt burdens in climate-vulnerable developing countries (figure 6.2a) (Bracking and Leffel, 2021). Low-income countries received only \$11.1 billion in 2022, representing less than one-quarter of the flows to lower-middle-income countries despite their critical dependence on biodiversity and natural resources (figure 6.2b) (OECD, 2024c).

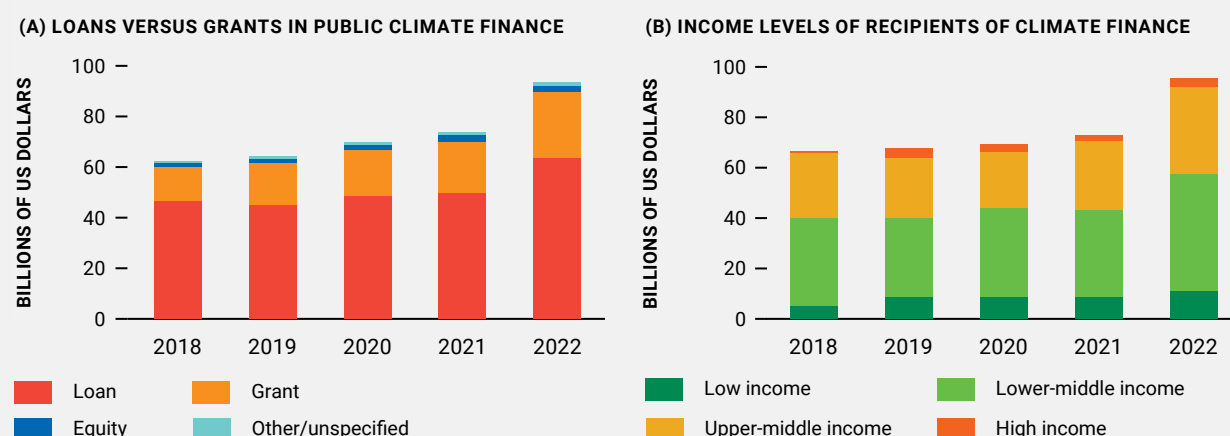
Table 6.1 Global climate and biodiversity finance flows, 2018–2023 (billions of US dollars)

Category	2018	2019	2020	2021	2022	2023
Global climate finance	812	900	945	1,242	1,651	1,903
Climate finance provided and mobilized by developed countries	79.9	80.4	83.3	89.6	115.9	n.a.
Biodiversity and development finance	13.0*	13.0*	17.9*	18.5*	25.8*	n.a.
<i>*Biodiversity-related + Biodiversity-specific</i> <i>(**Biodiversity-specific)</i>	(7.7**)	(8.2**)	(10.4**)	(11.1**)	(15.4**)	
<i>Circularity Gap Report finance</i>	10	27	20	42	37	28

Source: B. Naran, and others, "Global Landscape of Climate Finance 2025", Climate Policy Initiative, June (2025); Organisation for Economic Cooperation and Development (OECD), *Climate Finance Provided and Mobilised by Developed Countries in 2013–2022* (Paris, 2024b); Circle Economy, *The Circularity Gap Report: Finance* (2025). Available at <https://www.circularity-gap.world/finance>; and C. H. Lim, and others, "Unlocking Climate Finance in Asia-Pacific: Transitioning to a Sustainable Future", Departmental Papers No. 2024, 001, International Monetary Fund (2024).

Figure 6.1 Global mitigation versus adaptation in climate finance (billions of US dollars)

Source: B. Naran, and others, "Global Landscape of Climate Finance 2025", Climate Policy Initiative, June (2025); Organisation for Economic Cooperation and Development (OECD), *Climate Finance Provided and Mobilised by Developed Countries in 2013–2022* (Paris, 2024b).

Figure 6.2 Climate finance by financial instrument and recipient income level (billions of US dollars)

Source: Organisation for Economic Cooperation and Development (OECD), *Climate Finance Provided and Mobilised by Developed Countries in 2013–2022* (Paris, 2024b).

Financial flows in Asia and the Pacific

While most of the above data refers to global climate finance, the Asia-Pacific region faces its own challenges. Many of these challenges pertain to the uneven distribution of climate-related resources across the region. East Asia received 80 per cent (\$415.9 billion annually) of the region's climate finance flows between 2018–2019 (with 99 per cent of this amount going to China). However, the remaining subregions, that have numerous Least Developed Countries (LDCs) and climate-vulnerable populations, received only 20 per cent of these flows over the same period. Across other Asia-Pacific subregions, South Asia received 9 per cent (\$46.8 billion annually, of which 82 per cent went to India), South-East Asia received 5.3 per cent (\$27.8 billion), Central and West

Asia received 5.5 per cent (\$28.8 billion), while the Pacific received less than 0.2 per cent (\$0.6 billion) of estimated climate finance flows between 2018–2019 (ADB, 2023).

Another point relates to the mitigation-adaptation imbalance that is decidedly more pronounced in the Asia-Pacific region. Driven by energy investments in China and India, mitigation accounted for \$472.5 billion or approximately 91 per cent of climate finance flows between 2018–2019. Over the same period, adaptation accounted for \$40.8 billion or 8 per cent of climate flows, resulting in a mitigation-adaptation ratio of 11.6:1 (ADB, 2024). This imbalance is even more concerning given growing adaptation needs in Asia and the Pacific. Those needs rose to \$102–\$431 billion annually in 2021–2022. Since only \$34 billion was mobilized over the period,

the adaptation finance gap grew from between \$27–\$112 billion (2018–2019) to between \$68–\$397 billion (2021–2022) (ADB, 2024; UNEP, 2024).

Part of the problem is that finances remain concentrated in typically more economically attractive mitigation projects rather than less commercially viable adaptation projects in Asia and the Pacific. A similar and related problem pertains to the region's sectoral distribution of funds. For Asia and the Pacific, agriculture, forestry and fishing – the sector with the highest co-benefit potential – received only \$9.6 billion (6 per cent), compared with \$56.7 billion (38 per cent) received by the transport and infrastructure sectors (OECD, 2025b).

Other regionally-relevant concerns involve the unequal allocation of international climate funds. For instance, data from 2021–2022 suggests that South-East Asia, where 400 million people (77 per cent of the population) live in coastal areas and 229 million people live in zones vulnerable to sea level rise, receives only 5 per cent of the region's international climate finance. Moreover, the Pacific subregion receives less than 1 per cent of international climate finance, despite having the highest adaptation needs relative to its gross domestic product (GDP) (ADB, 2024).

A final point pertains to stark variations in the share of private sector finance. This is evident in climate finance where East Asia dominates in total private finance volumes (approximately \$133.7 billion or 32 per cent), while South-East Asia, Central and West Asia, and South Asia showed higher private shares proportionally (approximately 30 per cent) within their smaller overall climate finance pools. At the same time, the Pacific relies on much more public finance (83 per cent) as compared to private flows (\$0.1 billion or 17 per cent) due to limited market size and high investment risks. These disparities underscore the need for financing that works across sectors and sources to achieve synergies.

Despite fragmentation and geographic disparities, some data suggests the emergence of synergistic finance in Asia and the Pacific. To demonstrate, dual-benefit finance, that is intended to pursue adaptation and mitigation objectives, has increased from \$18 billion in 2018 to \$58 billion in 2023, focusing on sectors like AFOLU (Agriculture, Forestry and Other Land Uses), water and wastewater, and cross-sectoral investments yielding emissions reduction, resilience, food security and biodiversity benefits (Alberti and others, 2024; Vishnumolakala, Faucheux and Olutoke, 2025). However, despite the increase, such financing remains limited, accounting for only 3 per cent of total climate finance (\$1.9 trillion in 2023). Collectively, these dynamics suggest that the Asia-Pacific region faces a structural challenge; while many developed countries in the region can capture synergistic finance through market mechanisms and environment, social, and governance (ESG) focused models, other countries cannot replicate this approach due to underdeveloped capital markets and varying regulatory frameworks.

A clearer understanding of the different modalities and the challenges associated with synergistic finance would help support more informed decision-making on these issues.

6.2 Synergistic approaches

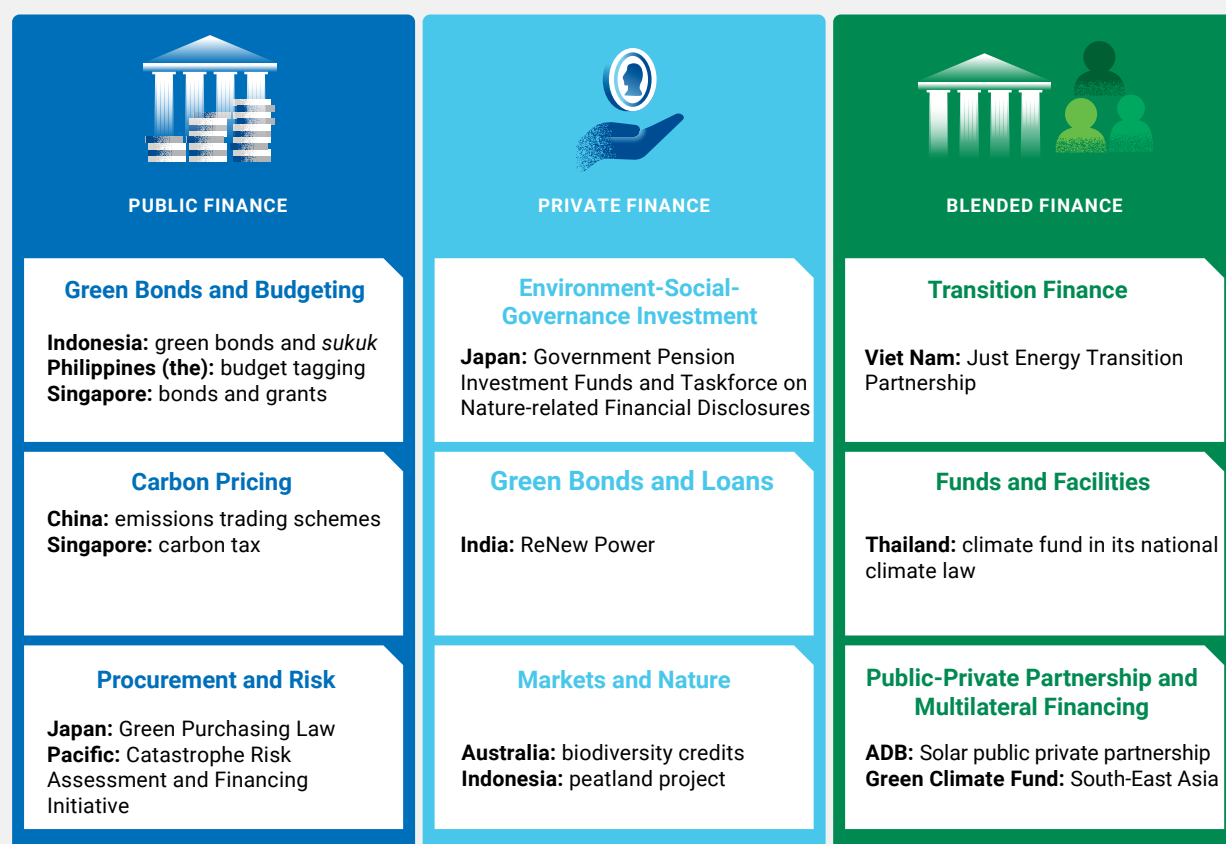
The previous section concluded by highlighting that significant structural challenges exist across the Asia-Pacific region. Nonetheless, there are positive examples of how various financing modalities can deliver synergistic outcomes in the region. This section reviews examples from public, private and blended finance, demonstrating how various streams of finance, both independently and collectively, can motivate governments and investors to work on multiple planetary crises simultaneously. Figure 6.3 illustrates the different financing modalities and examples from the Asia-Pacific region.

Public finance: A catalytic role for systemic change

Global public climate finance nearly tripled from \$215 billion in 2016 to \$628 billion in 2023, with concessional finance such as grants and low-cost debt accounting for approximately 20 per cent of total public flows (Naran and others, 2025). For developing and vulnerable regions, public finance is indispensable for adaptation, biodiversity conservation and other sectors with limited commercial viability. Despite constraints associated with a reliance on these public resources, countries in the Asia-Pacific region have pioneered public finance mechanisms that generate multiple benefits. This is particularly evident as countries seek to drive cross-sectoral transformations rather than simply fund individual projects.

Sovereign green bonds and climate budget tagging: Sovereign green bonds redirect debt financing toward sustainable development objectives without increasing overall debt burdens. Global issuances reached \$18 billion globally in 2023, with the Asia-Pacific region emerging as the fastest-growing market (Naran and others, 2025; UNEP-WCMC, 2025). Indonesia pioneered dual-instrument issuance in 2018, raising \$1.25 billion through conventional green bonds and Shariah-compliant green sukuk to fund solar power plants and restore mangroves. Indonesia also integrated a climate budget tagging methodology to systematically screen national budget expenditures for climate relevance, tagging over \$7.2 billion in climate-relevant expenditures by 2020. The Philippines adopted a similar tagging system in 2015, while Thailand and Viet Nam are also piloting comparable approaches. The Green Bond Grant Scheme in Singapore subsidizes up to 100 per cent of external review costs (capped at Singapore dollars (S\$) 100,000), reducing barriers for first-time issuers and catalysing regional market development with multi-benefit transformative potential.

Figure 6.3 Different financing modalities and relevant examples of public, private and blended finance



Source: IGES.

Green finance instruments and green public procurement:

National development finance institutions across the Asia-Pacific region increasingly adopt green finance mandates that drive the kinds of market transformation that can yield synergistic outcomes (Buchner and others, 2019; Bhandary, Gallagher and Zhang, 2021). The green credit guidelines in China require banks to conduct environmental risk assessments, while the Korea Development Bank committed 30 per cent of new lending to green, potentially multi-benefit projects by 2030. These institutions deploy patient capital at scale and target projects combining climate, biodiversity and development objectives. National development finance institutions (such as the Japan International Cooperation Agency, the Korea Development Bank or the National Bank for Agriculture and Rural Development (India)) are thus well-positioned to motivate the uptake of projects and programmes with co-benefits. Countries have also used their government purchasing power to create guaranteed demand for sustainable products that deliver on multiple SDGs. For instance, the Green Product Purchase System from the Republic of Korea requires public institutions to procure eco-labelled products (KEITI, 2023), creating \$8.9 billion in annual demand in 2022, and thereby incentivizes corporate

sustainability transitions (Brown and Han, 2024). The Green Purchasing Law mandates environmental performance in government procurement, covering 90 per cent of central government entities in Japan. These mechanisms provide a predictable demand for green industries, de-risk private investment and accelerate progress along some of the several integrated transformative pathways highlighted in Chapters 2–5 (e.g. climate-health, circular economy and nature-positive nexus approaches).

Carbon pricing and fiscal instruments: As of 2024, 12 Asia-Pacific countries had implemented carbon taxes or emissions trading systems with the potential to deliver synergistic outcomes (World Bank Group, 2026). The national emissions trading scheme of China, launched in 2021, covers 4.5 billion tons of CO₂ annually (approximately 40 per cent of national emissions), generating revenue that can be recycled into climate investments while also contributing to improved air quality and health (and complementing the co-control approach discussed in Chapter 8). Carbon taxes in Singapore (S\$25/metric ton rising to S\$50–S\$80/metric ton by 2030) demonstrate how small economies can implement pricing while protecting

economic competitiveness. However, carbon pricing can be politically challenging and accounts for less than 25 per cent of regional carbon dioxide (CO₂) emissions, limiting the potential for fiscal revenue, clean air and economic competitiveness benefits. Carbon pricing may also create some trade-offs by, for instance, levelling high costs on low-income households and energy-intensive industries, requiring policymakers to pay due attention to distributional impacts.

Just transition and subsidy reallocation: Some countries have redirected fossil fuel subsidies toward renewable energy in ways that can generate positive side-effects. The Just Energy Transition Partnership in Viet Nam, launched in 2022 with \$15.5 billion in public-private commitments, exemplifies an attempt at such an approach. The Just Energy Transition Partnership has used transition finance to accelerate the phase-out of coal while providing retraining and job placement for displaced workers, though some reviews have been critical of its results (International Rivers and the Vietnam Climate Defenders Coalition, 2024). The redirection of diesel subsidies to solar irrigation pumps in India illustrates another effort to generate environmental and social co-benefits. The reallocation of subsidies in this case created a \$3.2 billion market for solar-powered agriculture while reducing emissions and improving farmer livelihoods. In addition, the transition finance framework in Japan could include key performance indicators (KPIs) (e.g. industrial water efficiency, circular economy, habitat protection), encouraging firms to target multiple outcomes (Japan, Ministry of the Environment, 2024).

Disaster risk finance: Public finance builds climate resilience through disaster risk financing mechanisms that are both beneficial for the environment and for economic recovery. JICA funds climate-resilient infrastructure with post-disaster standby loans, providing quick-disbursing funds like the World Bank's Catastrophe Deferred Drawdown Option, along with technical cooperation, including agricultural climate-index insurance and early warning systems. The Pacific Catastrophe Risk Assessment and Financing Initiative pools sovereign disaster risk across 15 Pacific Island countries, capturing economies of scale by working across boundaries to enable access to parametric insurance scales that would otherwise be impossible for individual small states. This kind of finance delivers benefits that extend across countries and key sectors alike.

Additional mechanisms relevant to synergistic finance include carbon farming schemes that generate revenue from land-based carbon sequestration, debt-for-nature swaps that link fiscal relief with conservation commitments, and expanded insurance and risk-pooling mechanisms. Insurance, in particular, is a powerful yet underutilized tool for addressing both climate- and biodiversity-related risks.

Private finance: mobilizing capital at scale

While playing a useful catalytic role, public finance alone cannot bridge the financing gap by itself; policymakers must unlock the potential of private capital to mobilize resources and align financial flows to address multiple planetary crises. In 2023, private climate finance (amounting to \$1 trillion) was nearly twice as high as public finance (\$646 billion) globally, demonstrating the growing commercial viability of private finance (Naran and others, 2025). In the Asia-Pacific region, private finance reached \$168 billion (approximately 32 per cent of total flows) in 2018–2019. Those private flows came chiefly from corporations (\$72.3 billion), households (\$47.8 billion) and commercial financial institutions (\$45.1 billion) (ADB, 2024).

While playing a useful catalytic role, public finance alone cannot bridge the financing gap by itself; policymakers must unlock the potential of private capital to mobilize resources and align mainstream financial flows to address multiple planetary crises

ESG investing and institutional capital: Large institutional investors increasingly prioritize ESG sustainability in their investment portfolios. Further, the robust disclosure ecosystem in Japan, including early adoption of the Taskforce on Nature-related Financial Disclosures (TNFD) framework, together with widespread ESG reporting requirements and strong investor expectations for integrated sustainability performance, creates significant market pressure for corporations to integrate climate, nature and pollution considerations in investment and operational decisions. The Government Pension Investment Fund in Japan exemplifies another ESG-aligned institutional investment vehicle, and as of 2024, Japan leads in nature-related financial disclosures with over 130 companies committed to TNFD reporting (TNFD, 2024). Globally, impact investing reached nearly \$1.6 trillion in 2024, though Asia and the Pacific accounted for only 8 per cent, with most of the resources concentrated in Europe (53 per cent) and North America (35 per cent) (Hand and others, 2024). Emerging and developing Asia accounts for roughly 10 per cent of global assets under management but only 2 per cent of global ESG funds; closing these gaps could generate an additional \$500 billion per year in climate-related inflows to the region (CLim and others, 2024).

Green and sustainability-linked bonds: Green bonds have expanded since 2007, with global aligned green bond issuances reaching \$671.7 billion in 2024, while cumulative green bond issuance totalled \$3.5 trillion by the end of 2024. The Asia-Pacific region accounted for approximately 26 per cent of new aligned issuance in 2024 (Climate Bond Initiative, 2025). For instance, the Development Bank of Singapore issued S\$5 billion in green bonds for renewable infrastructure, while Renew Power has also issued Green, Social, Sustainable, and Other (GSS+) labelled bonds for multi-benefit low-carbon projects in India. Overall green bond issuances across the Asia-Pacific region continued to expand significantly in 2023, while green lending in the region also grew rapidly between 2020 and 2024 (OECD, 2025a). However, green bonds are not a panacea; the lack of universally enforceable international standards creates risks of greenwashing, where funds may support projects with limited environmental benefits. To prevent this practice, sustainability-linked loans ideally tie funding to measurable climate or sustainability outcomes, expanding the availability of truly sustainable finance. For instance, in Japan, rapidly expanding sustainability-linked loans and bonds can tie performance incentives to climate, nature and pollution targets, motivating corporations to address multiple crises simultaneously. Yet, verification standards and transparency must be strengthened to ensure credibility.

Carbon markets and biodiversity credits: Carbon credit markets, both compliance-based and voluntary, are expanding globally, providing revenue streams for multi-benefit mitigation and conservation projects. Biodiversity credits are emerging as tradeable units that reward restoration and biodiversity-maintenance projects (UNEP-WCMC, 2025). In Australia, buying biodiversity credits under the Biodiversity Offset Scheme represents an exemplary landmark initiative to prevent biodiversity loss, and pilot initiatives in the Philippines are exploring credit markets for mangrove restoration.

Natural capital investments and NbS: Natural capital investments recognize the value of ecosystem services, such as forests and wetlands, that provide climate resilience and carbon storage. For instance, the Katingan Mentaya Project in Indonesia demonstrated how carbon finance enables conservation through peatland restoration. Further, investment opportunities also exist for climate adaptation and resilience in water security (Buchner and others, 2019). However, investments in NbS face barriers, including unclear asset definitions, limited financial data, high costs and small scales (UNEP-WCMC, 2025). Learning from the evolution of renewable energy, an asset class with clear classifications and documented returns, may offer a way forward for NbS to attract more investment and deliver greater benefits. This will also require improvements in data access, transparency, regulation and coordination to prevent unintended consequences. The Tropical Forest Forever Facility, announced at UNFCCC COP30, represents an endowment-based approach to ecosystem preservation with a target of \$125 billion. The Tropical Forest Forever

Facility invests the principal and uses the returns to make performance-based payments to countries that maintain low deforestation rates with potential ripple effects for surrounding communities. This approach has demonstrated the potential of sustainable financing for forests while addressing climate mitigation and biodiversity conservation. Though only \$11 million has been mobilized, the model illustrates how financial structures can align conservation with sustainability.

Circular economy finance: Circular economy finance addresses resource efficiency and waste reduction, creating connections to both climate mitigation and nature conservation. The provision of this finance (as also noted in Chapters 1 and 4) nonetheless varies greatly by region: Europe receives 57 per cent (\$15.5 billion annually), North America receives 21 per cent (\$5.8 billion), and Asia receives 13 per cent (\$3.6 billion). While significant circular investment flows to manufacturing and agriculture in Asia and the Pacific, data gaps persist in monitoring trends and assessing progress (Circle Economy, 2025).

Public-private partnerships: Public-private partnerships (PPPs) for climate finance leverage the strengths of the public and private sectors to deliver public services while maintaining accountability. The Solar PPP Investment Program of Uzbekistan, supported by the Asian Development Bank (ADB), includes providing credit guarantee facilities and assisting the government in identifying and developing PPP projects. Guarantee schemes and risk-sharing mechanisms can be powerful levers to mobilize private investment by reallocating or absorbing risks that private actors are unable or unwilling to bear.

Blended finance: Leveraging public funds to unlock private funding

Blended finance can serve as a strategic tool to attract private capital to address climate, biodiversity and pollution challenges. This requires combining or integrating public or concessional funding from governments, multilateral development banks (such as the ADB and the World Bank), bilateral donors or philanthropic donors (for example, the Rockefeller Foundation). The core mechanisms that enable blended finance to mobilize private capital include: 1) guarantees that protect investors against political, currency or default risks, significantly lowering capital costs and making projects in emerging economies more attractive to risk-averse investors; 2) concessional finance that includes below-market rate loans and grants that improve project risk-return profiles (this accounts for 74 per cent of international flows to LDCs, making it critical for vulnerable economies); and 3) layered funds (catalytic equity) that use public or philanthropic capital in first-loss positions, absorbing initial risks to attract private investors. Emerging innovations that fall in this category and have the potential to deliver synergies include carbon credit-backed loans and climate

resilience bonds. Blended finance instruments often rely on risk-mitigation and credit-enhancement mechanisms to align the risk-return profile for private sector investments. These elements should be explicitly recognized as core enablers of effective blended finance.

Despite innovations in public, private and blended finance, several barriers continue to constrain effective mobilization across all financing sources, creating structural obstacles that necessitate systemic reforms to deliver synergistic outcomes.

Further, multilateral development banks, including the ADB, World Bank, Asian Infrastructure Investment Bank and the New Development Bank can provide concessional loans, technical assistance and signals to private investors. They play crucial roles in setting standards and mitigating risks in early-stage projects – many of which have synergistic potential. Bilateral donors such as Kreditanstalt für Wiederaufbau and the Agence Française de Développement predominantly use grants for biodiversity finance and capacity-building. Philanthropic foundations (such as the Rockefeller Foundation and Bloomberg) provide patient capital and risk tolerance, contributing \$700 million in biodiversity flows in 2022 to fund innovation, policy development and proof-of-concept projects. Regional examples of blended finance include the involvement of the Green Climate Fund, which committed \$325.8 million in South-East Asia through its private sector facility. Several Asia-Pacific governments are also establishing climate funds to finance Nationally Determined Contribution (NDC) implementation through blended finance. For instance, Thailand has proposed a Climate Fund in its Draft Climate Law to leverage international public finance and private capital (Wipatayotin, 2025). Meanwhile, some countries in Central Asia have developed innovative approaches to align public and private financial resources with national development priorities and the SDGs (UN Joint SDG Fund, 2024). These funds create mechanisms for coordinating climate finance and help address financing fragmentation.

The ASEAN Catalytic Green Finance Facility mobilizes \$1 billion from the ADB, the European Investment Bank and Agence Française de Développement for green infrastructure in sustainable transport, clean energy and

water systems. The Global Environment Facility provided \$6.3 billion in co-financing across the region. Structuring deals under a blended approach requires synergies among multiple stakeholders with different objectives and risk appetites. Scaling up remains a concern, as many projects remain small and fragmented. There is also a need for robust monitoring frameworks, exit strategies and capacity development in local institutions to ensure the long-term sustainability and replicability of these financing models.

Persistent challenges mobilizing finance

Despite innovations in public, private and blended finance, several barriers continue to constrain effective mobilization across all financing sources, creating structural obstacles that necessitate systemic reforms to deliver synergistic outcomes.

Public finance challenges: Fiscal and debt pressures severely limit the mobilization of public resources. These constraints are often structural, institutional and political in nature. Fragmentation, across ministries, budget processes and levels of government, represents a major barrier to synergistic finance and should generate more attention. These challenges can be particularly acute in low-income countries. As of 2023, 60 per cent of low-income countries faced a high risk of debt distress, forcing climate finance to compete with immediate development priorities, including poverty reduction, healthcare and education (Kharas and Rivard, 2024). Developed countries face parallel challenges; austerity measures constrain fulfilment of international climate finance pledges. Institutional and technical deficits compound these fiscal constraints. Weak capacity to design integrated climate-biodiversity-development projects, definitional challenges in tracking domestic climate finance and coordination failures across siloed ministries create inefficiencies and result in missed synergies. Political economic barriers, including resistance to redirecting fossil fuel subsidies (\$7 trillion globally in 2022) and opposition to carbon pricing, further impede resource mobilization (Bhandary, Gallagher and Zhang, 2021).

Private capital challenges: Mobilizing private capital faces distinct structural challenges. High perceived risk associated with low-carbon and adaptation investments discourages mainstream financiers, stemming from limited data, inadequate analytical tools and weak regulatory mandates for integrating climate and biodiversity risks (NGFS, 2023). Information asymmetries and data gaps, including the absence of standardized sustainability metrics and confidentiality concerns, create significant hurdles for evaluating environmental performance (IFRS, 2023a; 2023b; TNFD, 2023). Payback mismatches arise when long-term sustainable projects conflict with short-term investor return expectations (OECD, 2015). Policy incoherence across the region such as inconsistent regulations and varying definitions of “green” activities stifles cross-

border investment and creates confusion (IEA, 2023). Sectoral fragmentation, where climate, biodiversity and pollution issues are addressed in isolation, leads to inefficient solutions and missed opportunities for synergies (see Chapter 8). Policy and regulatory uncertainty remain a pervasive barrier, affecting investor predictability beyond climate and biodiversity mandates alone. Limited data and analytical tools also pose systemic challenges across markets (see Chapter 7). Insufficient risk mitigation instruments and concessional capital further constrain private investment.

The case studies demonstrate that challenges to synergistic finance can be managed through greater attention to regulatory clarity, cost reductions, payment-for-performance structures that align incentives and existing partnerships that remove coordination constraints.

Blended finance challenges: Blended finance is a critical financial mechanism for supporting synergistic development projects in emerging countries, including those in the Asia-Pacific region. Despite its promise, blended finance also faces critical structural and operational constraints. For instance, additionality concerns arise when blended structures function like market investments rather than catalysing genuinely additional private capital. This may potentially increase developing country indebtedness while shifting accountability for the provision of multi-benefit public goods to profit-oriented actors. Financing gaps persist between early-stage funding and institutional investment, compounded by valuation complexity, small scale and long investment horizons, which deter commercial investors. Operational challenges limit effectiveness due to high transaction costs from coordinating multiple stakeholders with divergent objectives, resulting in small, fragmented projects rather than transformative scalable interventions. Project complexity varies significantly across countries, sectors and development actors, resulting in inconsistent approaches that hinder replication. Commercial confidentiality impedes evaluation of private-sector climate governance, while standardized reporting methodologies and explicit impact tracking remain insufficient. Without robust monitoring frameworks, exit strategies and local capacity development, the above collection of projects risk creating a dependency on concessional finance to deliver synergies.

Trade-offs and transaction costs: While synergistic financing offers potential, delivering co-benefits across climate, biodiversity and pollution objectives also comes with challenges. First, transaction costs increase as integrated project design requires coordination among multiple ministries (environment, finance, agriculture, energy), technical experts and stakeholders, each with distinct mandates and metrics (see also Chapters 7 and 8). Project preparation extends as teams develop integrated monitoring frameworks, negotiate benefit-sharing arrangements and align competing objectives. Second, coordination failures emerge when institutional silos persist; environmental ministries prioritize conservation while finance ministries emphasize economic returns, creating bottlenecks. Similarly, international regimes still maintain fragmented funding mechanisms, where climate, biodiversity and chemicals operate in isolation, hindering integrated risk assessment and cross-sectoral resource allocation (see Chapter 8). In addition, measurement complexity arises from tracking multiple outcomes simultaneously, which requires monitoring systems that many developing countries lack the capacity to implement (see Chapter 7). While initiatives like the United Nations Environment Programme Finance Initiative promote ESG principles and responsible finance, they have yet to drive systemic integration across responses to the triple planetary crisis.

However, regional cases demonstrate that these challenges can be managed. This often occurs with greater attention to regulatory clarity, cost reductions (as seen in the renewable energy mandate of Fiji), payment-for-performance structures that align incentives (as with risk allocation in India) and existing partnerships that remove coordination constraints (as in JICA's engagement in Tamil Nadu) (Tamil Nadu, 2021; 2022). The critical insight from these successful examples is that transaction costs decline as enabling conditions strengthen. Initial investments in policy coherence, technical capacity and institutional coordination create an enabling environment that reduces per-project costs over time. When a well-designed enabling environment is in place, the benefits of synergistic approaches can lower many of the barriers and outweigh the transaction costs of taking integrated actions.

6.3 Case studies

This section examines cases of synergistic finance from countries in the Asia-Pacific region. It demonstrates that synergies can arise through finance-driven approaches that depend on the structure of the financial mechanism or finance-enabling approaches that involve well-designed projects that deliver multiple benefits. The first set of cases are related to the first approach: finance-driven synergies. The latter set of cases are related to finance-enabling synergies.

Table 6.2 Summary of the case studies

Areas of synergies	Synergistic solutions/approaches	Key actors	Enablers
Case study: Financial system transformation for climate resilience in Fiji SDGs: 1 5 8 9 10 13			
• Renewable energy • Adaptation • Disaster relief • Resilience	• Introducing various financial mechanisms with regulatory mandates	• Policymakers • Public and private financial institutions • Vulnerable stakeholders	• Regulatory mandates for renewable energy finance and disaster relief finance • Digital infrastructure for financial inclusion
Case study: Energy efficiency market transformation through blended finance in India SDGs: 7 8 9 12 13			
• Climate mitigation through energy efficiency • Poverty reduction • Market transformation	• Private investment, economies of scale, lower costs, and expanded consumer access	• Public fund owner/operators • Manufacturers to sell energy-efficient equipment	• Performance-based finance
Case study: Peatland restoration through carbon finance to enable conservation in Katingan, Indonesia SDGs: 1 13 15 17			
• Carbon sequestration protection • Biodiversity protection • Community livelihood enhancement	• Holistic design of project, which combines ecosystem protection, community development, and biodiversity enhancement	• Local government, companies generating carbon credit through project implementation • Local communities	• Carbon credit revenue providing sustained income and enabling comprehensive conservation activities
Case study: The Binh Duong Waste-to-Energy project in Viet Nam SDGs: 7 11 12 13 17			
• Urban waste management, including waste-to-energy, climate mitigation and circular economy • Landfill diversion and resource recovery from municipal waste	• A public-private partnership-enabled integrated design combining composting and waste-to-energy to produce compost and renewable electricity	• JICA • Public utility company (BIWASE) • Provincial/local government • Private companies	• JICA's concessional private sector finance to BIWASE, together with a PPP framework and national policy support, which attracted equity investment in BIWASE from a private company
Case study: Official Development Assistance financing enabling an integrated conservation-livelihood model in Tamil Nadu, India SDGs: 1 13 14 15			
• Biodiversity conservation • Climate mitigation/adaptation • Livelihoods	• Integrated conservation – livelihood model combining afforestation and coastal/marine ecosystem restoration with community livelihood activities and capacity development	• JICA • Department of Forest, Tamil Nadu • Local communities • NGOs/research institutes	• JICA's ODA finance, together with technical cooperation • Local government finance

Finance-driven synergies

Finance-driven synergies occur when the financing mechanism itself, through its structure, incentives or regulatory requirements, directly creates co-benefits across multiple sustainability domains. The Asia-Pacific region demonstrates several cases where specific financing mechanisms overcome barriers through innovative structures, creating synergistic outcomes and pathways to address fragmentation while scaling finance. Understanding these mechanisms is crucial for not only demonstration projects but for spreading success. The following cases exemplify finance-driven synergies that should be prioritized for replication.

Financial system transformation for climate resilience in Fiji

Fiji offers a compelling example of how integrated financing mechanisms can create synergies across climate, economic and social objectives. A regulatory mandate by the Reserve Bank of Fiji requires banks to allocate 2 per cent of their deposits to renewable energy loans, generating sustained demand, reducing lending risk, mobilizing private capital and accelerating progress toward the country's 100 per cent renewable energy target (AFI, 2019; RBF, 2012). This mandate has transformed banking behaviour, making renewable energy financing a mainstream component of bank

portfolios rather than a niche product (RBF, 2012). Complementing this mandate, Fiji became the first developing country to issue sovereign green bonds worth approximately \$50 million, establishing a green finance framework and setting benchmark pricing for green assets, which encouraged other Pacific nations to explore similar approaches (GIZ, 2019). Disaster finance architecture further strengthens resilience in Fiji through pre-positioned credit facilities that provide recovery capital – \$235,000 at 5 per cent interest for businesses and \$2,350 at 4.5 per cent for households – supported by a mobile payment infrastructure that enabled rapid disbursement to 32,800 households after Cyclone Winston (AFI, 2018).

Additionally, the Fiji National Provident Fund has repurposed resources for disaster relief, benefiting at least 160,000 members and demonstrating how financial institutions can play a pivotal role in multi-benefit climate adaptation (Naryan, 2016). These mechanisms collectively deliver quantified synergies: financial inclusion through mobile payment access, climate adaptation via disaster response capability, climate mitigation through renewable energy financing and economic resilience through rapid recovery capital. The case of Fiji also illustrates the potential for regulatory levers and digital infrastructure that serves as high-impact entry points for countries with functional banking and mobile payment systems, particularly the Pacific small island developing States (SIDS) and climate-vulnerable economies. The synergy pathway from the Fiji example is clear; regulatory mandates create sustained demand, reduce lending risk and mobilize private capital for renewables, while digital infrastructure enables rapid disaster disbursement and enhances financial inclusion. Together, these mechanisms transform the financial system so that it can deliver integrated outcomes aligned with multiple SDGs 1, 5, 8, 9, 10, and 13.

Energy efficiency market transformation through blended finance in India

The Super Energy Efficient Equipment Programme illustrates how payment-for-performance financing can catalyse multidimensional synergies. Through this programme, the Clean Technology Fund deployed \$45 million using a payment-for-performance model, in which payments to manufacturers were based on units sold rather than units produced. This approach partly transferred demand risk from the private sector to a public fund, enabling manufacturers to invest \$75 million in production capacity while consumers contributed \$55 million in purchases. By restructuring market incentives, the mechanism created a virtuous cycle: manufacturers faced acceptable risk profiles, economies of scale reduced unit costs, lower prices expanded consumer access and increased sales validated continued private sector commitment, ultimately making the market self-sustaining.

The quantified co-benefits from this effort were significant: 500 million tons of CO₂e emissions avoided, reduced energy costs and supported economic development, affordable access contributed to poverty reduction and sustained private sector engagement helped transform the market. Unlike traditional grants or subsidies, this performance-based financing structure helped build confidence around the pursuit of integrated outcomes. In addition to the impacts from this particular case, replication potential from this approach is high, as similar payment-for-performance models can be applied to other consumer goods with efficiency or emission-reduction potential, such as vehicles, buildings and industrial equipment, in emerging markets with sufficient scale. In this instance, payment-for-performance financing enabled integrated outcomes across climate mitigation, poverty reduction and market transformation. These outcomes align closely with SDGs 7, 8, 9, 12 and 13.

Peatland restoration through carbon finance to enable conservation in Katingan, Indonesia

The Katingan Project in Central Kalimantan exemplifies how carbon finance can enable integrated conservation strategies that deliver multiple environmental and social benefits. As one of the world's largest peatland restoration initiatives, the project protects 149,800 hectares from degradation while generating verified carbon credits. It secured \$1.3 billion in carbon finance commitments over 30 years, making peatland conservation economically viable. While carbon financing provides the essential revenue stream, the synergies arise from the project's holistic design, which combines ecosystem protection, community development and biodiversity enhancement. This approach demonstrates how market-based mechanisms can facilitate well-structured environmental projects rather than drive them.

The quantified outcomes from the project were sizable: annual carbon sequestration of 7.5 million tons CO₂e; biodiversity conservation that safeguards habitats for orangutans, clouded leopards and over 190 bird species; livelihood enhancement for 2,700 families through alternative income sources; and peatland hydrological restoration that reduces forest fire and haze risks. The project also demonstrates the potential for replicating large-scale peatland conservation through carbon markets, particularly in South-East Asia, where ecosystems are under pressure from deforestation. By aligning carbon pricing with community development, the model creates a sustainable alternative to land conversion. The synergy pathway is again straightforward: carbon credit revenue provides sustained income, enabling comprehensive conservation activities such as ecosystem monitoring, patrol systems and fire prevention, alongside community programmes in agroforestry, sustainable fisheries and education. These integrated efforts deliver climate mitigation, biodiversity protection and livelihood improvement, aligning with SDGs 1, 13, 15 and 17 (Green Climate Fund, 2022).

Finance-enabling synergies

Finance-enabling synergies occur when financing facilitates integrated approaches, but the synergies primarily result from project design rather than the financing mechanism itself. In these cases, the financing provides necessary capital and enables multi-stakeholder coordination, but the co-benefits arise from how the project is designed and implemented. The financing mechanism plays an essential enabling role but is not the primary driver of the synergies. This category includes public finance (e.g. standalone official development assistance (ODA) with concessional terms enabling long-term integrated projects), multi-donor coordination or PPP structures. The following two cases reflect how financing can enable well-designed synergistic projects.

The Binh Duong Waste-to-Energy project in Viet Nam

The Binh Duong Waste-to-Energy project in Viet Nam demonstrates how circular-economy infrastructure can generate multidimensional benefits and synergies within a PPP framework. JICA provides concessional financing, while the Binh Duong Water Environment Joint Stock Company manages operations under the PPP structure. Technologies such as waste-to-energy incineration are considered instrumental in achieving the national targets, with Prime Minister's Decision No. 31 outlining development plans, incentives, tariffs and institutional roles (Viet Nam, 2014). The project includes an 840 ton/day composting facility and a 200 ton/day incineration plant with a 5 megawatts electricity generation capacity, supported by the JICA's long-term capital that aligns with infrastructure investment timelines. Risk allocation is generally structured so that the public sector bears construction risk, while the private operator bears operational risk.

Officially launched in June 2025, Phase 1 is poised to deliver significant outcomes: increased waste treatment capacity by 333 tons/day, composting of 840 tons/day, processing of 500 tons/day of sorted municipal waste, incineration of 200 tons/day and renewable electricity generation of 17,520 MWh annually. These outputs – compost for agriculture, renewable electricity and landfill diversion – stem from a single waste stream, reducing methane emissions and supporting climate mitigation. These synergies result primarily from the integrated circular-economy design, where waste is converted into multiple resources rather than from the financing mechanism itself, although PPP financing plays a supportive role in risk-sharing and project delivery. This model is replicable in rapidly industrializing countries and regions with existing waste infrastructure and strong policy frameworks, demonstrating the viability of waste-to-energy solutions in South-East Asia. Replication requires composting and energy recovery to reduce pollution and emissions, while PPP financing ensures risk-sharing and project delivery. These outcomes align with multiple SDGs, including SDG 7, 11, 12, 13 and 17.

Official development assistance financing enabling an integrated conservation-livelihood model in Tamil Nadu, India

The Tamil Nadu Biodiversity Conservation Project demonstrates how ODA financing can enable integrated conservation-livelihood models through adaptive design and multi-stakeholder coordination. JICA provides concessional ODA loan financing alongside the Government of Tamil Nadu's counterpart funding, with the financing mechanism primarily enabling rather than driving synergies. Building on prior projects that increased forest cover from 13.1 per cent to 20.3 per cent, JICA adopted an adaptive approach that links conservation with livelihood development. Interventions include 60,000 hectares of afforestation, 1,050 hectares of mangrove restoration, 3.6 hectares of coral reef rehabilitation and 300 hectares of seagrass restoration, combined with invasive species removal, wildlife corridor development, women-led livelihood groups and value chain strengthening. Institutional capacity is reinforced through training for 5,400 staff, ensuring long-term sustainability. The ODA structure provides long-term capital aligned with ecosystem timescales and integrates technical cooperation with the World Wildlife Fund and the Wildlife Institute of India, while coordinating with national programmes such as the Green India Mission and Tamil Nadu Climate Action Plan 2.0 (Tamil Nadu, 2021). Quantified synergies include annual carbon sequestration of approximately 243,000 tons CO₂e, biodiversity conservation across coastal and terrestrial ecosystems, reduced human-wildlife conflict through corridor development and measurable livelihood improvements in target villages. Remote sensing and community monitoring systems track ecological and socioeconomic outcomes. This model demonstrates the replication potential of long-term bilateral partnerships that enable adaptive learning and scaling, fostering local ownership and accelerating innovation through multisector collaboration (UNEP-WCMC, 2025). In this case, synergies are achieved by ensuring a match between concessional financing and ecosystem timescales, enabling integrated design that aligns local incentives with ecological outcomes, while technical cooperation ensures coordination and sustainability, contributing to SDGs 1, 13, 14 and 15.

6.4 Enablers for scaling and replication

Implementing and scaling synergistic finance both require establishing strong enabling environments that address immediate project execution challenges while creating opportunities for context-appropriate replication. A carefully designed set of enablers can address some of the challenges outlined previously in the chapter such as reducing transaction costs, aligning incentives and building institutional capacity across both the public and private sectors. The following sections describe enablers that facilitate the transition from fragmented financing to integrated catalytic approaches.

Governance and institutional coordination

Siloed governance structures create policy uncertainty and fragment capital allocation. A shift to what Chapter 8 calls “transformative governance” can institutionalize cross-agency coordination and break down siloes between environmental and finance agencies. Greater cooperation can support the integration of environmental objectives into budgetary spending decisions, addressing both project implementation challenges and enabling scaling. For instance, the updated Climate Fiscal Framework of Bangladesh, which links climate-relevant budget allocations to \$2.4 billion for the fiscal year 2020–2021 across 25 ministries/divisions, demonstrates systematic expenditure monitoring (Bangladesh, Ministry of Finance, 2021). Integrated strategies in Viet Nam, including the National Green Growth Strategy (2021–2030) and the National Strategy for Climate Change until 2050, provide a coordinated policy framework with multiple synergies.

Technical capacity for project preparation and evaluation

Deploying synergistic finance requires specialized technical capabilities often absent in government agencies and domestic financial institutions. Priority interventions can include structured training in green finance and in the preparation of multi-benefit projects, establishing national multisector climate funds and creating specialized technical units within ministries to partner with Multilateral Development Banks (MDBs). The low carbon technology assessment under JICA’s Project to Support the Planning and Implementation of Nationally Appropriate Mitigation Actions in Viet Nam is a good example. This project conducts systematic sectoral dialogues across the transport, agriculture, energy, waste, and land use, land-use change and forestry (LULUCF) sectors, developing prioritized technology lists based on multi-criteria assessments that include potential for greenhouse gas (GHG) reduction and economic performance while accounting for country-specific contexts.

Data infrastructure and transparency

Inadequate data and information asymmetries prevent private capital from flowing to synergistic investments, both during project preparation and performance monitoring. Adopting internationally recognized reporting standards, including the International Sustainability Standards Board’s (ISSB) IFRS S1 and S2 (IFRS S1: General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2: Climate-related Disclosures) for climate and the TNFD for biodiversity, can ensure cross-jurisdictional comparability. In addition, harmonized disclosure standards and climate budget tagging systems can enable proper monitoring of environmental expenditures.

Public finance dashboards that report on climate spending enhance transparency, build stakeholder trust and facilitate private-sector engagement. The need for such data is evident; a recent International Monetary Fund (IMF) survey of 12 Asia-Pacific country authorities revealed that 89 per cent cited data gaps and limited firm capacity as the primary barrier to expanding climate disclosure requirements (Lim and others, 2024). Support for improved data and multi-benefit assessment is not only the responsibility of governments. As demonstrated in Box 6.1, the private sector is playing a role in using impact assessments to achieve multiple benefits. Chapter 7 makes a similar point arguing that, in addition to governments and development partners, the private sector can also contribute to efforts to expand the quality and quantity of data needed to increase finance.

Taxonomies and market standards

The taxonomy of synergy activities, along with their outcome metrics, helps financial institutions and investors make informed investment decisions for both implementation and scaling. In addition, such a taxonomy can be used to set whole-of-government green procurement targets to create demand for sustainable products. For example, the taxonomies adopted by countries in ASEAN (such as the sustainable finance taxonomies in ASEAN 2025) not only include climate mitigation and adaptation but also objectives for protecting ecosystems and biodiversity, as well as for the circular economy. The Article 6.4 mechanism under the Paris Agreement requires the use of a sustainable development tool to assess and report the SDG effects of planned activities. By institutionalizing co-benefit evaluation, it incentivizes carbon-reduction initiatives that also advance nature conservation, the circular economy and social development, addressing the triple planetary crisis holistically.

Local financial market development

Local financial market development enables synergistic financing to scale at the national level. Sovereign green bond issuance establishes pricing benchmarks, catalysing private participation. Regulated credit markets assign financial value to conservation outcomes, while tiered tax incentives mobilize private capital toward multi-benefit investments. As outlined in Chapter 5, potential also exists to leverage green fiscal transfers, regional green bonds and land value capture for sustainable transport and housing to support synergistic finance at the local level (Basu and Lim, 2024).

Box 6.1 Monetizing synergies through impact scoring

One way to generate synergies is to embed impact measurement and management within investment and asset-management strategies. Rather than treating environmental and social outcomes as philanthropic add-ons or compliance requirements, a growing number of investors are incorporating measurable sustainability outcomes into core value-creation strategies. By systematically assessing environmental and social performance alongside financial performance, investors can improve risk management, enhance transparency, identify opportunities for operational improvement, and better align assets with growing demand for sustainable investments. In this way, impact measurement can help support both commercial returns and broader sustainable development objectives.

The Actis Impact Score (AIS) provides one illustration of this approach. Introduced in 2019 as an open-source framework aligned with the SDGs, AIS assesses investments based on the intentionality, scale, depth, duration and measurability of environmental and social impacts. By integrating these considerations into investment decision-making and asset management, the framework seeks to support value creation while encouraging the delivery of multiple environmental and social benefits. Actis has applied AIS across its portfolio, including in the development of Levanta Renewables in South-East Asia, where a buy-and-build strategy was used to expand a renewable energy platform from an initial 300 MW pipeline to approximately 1.5 GW across Malaysia, the Philippines, Thailand and Viet Nam. Such approaches demonstrate how financial, environmental and social objectives can be pursued simultaneously, creating incentives for investments that generate multiple co-benefits rather than targeting single outcomes in isolation.

Source: Actis, "Impact is", 2019. Available at <https://www.actis.com/wp-content/uploads/2022/02/impactis-report-low-res-cropped.pdf>; Actis, "Actis acquires majority stake in Southeast Asia renewables platform Levanta Renewables", press release, 11 August 2022. Available at <https://www.actis.com/2022/08/11/actis-acquires-majority-stake-in-southeast-asia-renewables-platform-levanta-renewables/>; Global Impact Investing Network (GIIN), "What you need to know about impact investing", 24 January 2025. Available at <https://thegiin.org/publication/post/about-impact-investing/>

6.5 Key insights and recommended actions

Achieving synergistic financing requires moving from fragmented approaches toward coherent strategies that simultaneously mobilize and align public, private and blended finance at scale. The case studies in section 6.3 demonstrate proven pathways from regulatory mandates transforming financial systems (Fiji) to carbon pricing making conservation viable (Indonesia). Building on the approaches and enablers outlined in the previous section, the following recommendations provide actionable pathways for national and local governments as well as development partners and regional entities to increase the efficiency and effectiveness of financial flows and achieve multiplicative effects when addressing the triple planetary crisis. Due to the thematic focus of the chapter, the recommendations emphasize the roles of national governments and development partners.

Recommendations for national governments

- Operationalize inter-ministerial coordination by establishing secretariats with authority to review and approve public investments based on climate, biodiversity and pollution criteria.
- Design an integrated financial system and regulatory levers for integrated planning and actions with co-benefits.
- Repurpose subsidies that are misaligned with climate, nature, and pollution, redirecting resources toward multi-benefit environmental investments.
- Formulate comprehensive national strategies quantifying total financing requirements across multiple sustainability domains, explicitly identifying synergies and trade-offs.
- Integrate climate and nature-related risks into the prudential frameworks of banks and financial institutions, including risk disclosure and stress testing.
- Embed equity, inclusion and just transition mechanisms within national financing strategies, ensuring that the benefits and costs of the environmental transition are distributed fairly across income groups and communities, particularly in economies undergoing structural transformation.
- Adopt climate-nature investment taxonomies and sustainable budget tagging systems to systematically classify and track public expenditure across climate, biodiversity and pollution objectives, enabling integrated investment planning and performance monitoring.
- Create market conditions that reward synergistic approaches such as implementing tiered tax incentives that provide progressively greater benefits for projects demonstrating co-benefits.

- Mandate green public procurement policies prioritizing suppliers with strong performance across multiple environmental metrics.
- Leverage corporate disclosure infrastructure to drive capital allocation toward environmental goals by referring to internationally recognized reporting standards, including ISSB's IFRS S1 and S2 for climate and TNFD for biodiversity.
- Link carbon pricing with biodiversity conservation objectives to make integrated conservation financially viable.
- Scale-up performance-based finance to target synergistic outcomes, which reduces risks for financial institutions and enables market sustainability.
- Establish sustainability-linked loan programmes through national development banks, offering preferential rates for projects meeting integrated environmental criteria.
- Apply tools to monetize synergies through impact scoring by systematizing the creation and verification of multiple benefits to attract investors.
- Build regulatory capacity for integrated risk assessment, enhance financial institution capacity for portfolio impact analysis and develop reporting systems that capture climate-nature-pollution linkages.
- Promote harmonized co-benefit metrics across MDBs operating in the region to enable consistent measurement, aggregated reporting and joint financing of synergistic investments.
- Promote United Nations voluntary frameworks like Principles for Responsible Banking for the banking community and Principles for Sustainable Insurance for the insurance community to integrate sustainable practices into operations and build strong peer-to-peer learning networks.
- Drive the deployment of blended finance mechanisms at scale, catalysing private capital for synergistic investments that would not otherwise attract commercial financing.
- Identify priority sectors and geographies for deploying guarantees, concessional finance and layered fund structures using public or philanthropic capital to de-risk investments and improve risk-return profiles.

Recommendations for local governments

- Invest in subnational data collection to generate granular data on emissions, biodiversity indicators and pollution levels, making this data publicly accessible through online dashboards and feeding into national statistical systems to support integrated environmental planning and investment decisions.

Recommendations for development partners

- Systematically invest in training government officials and financial institution's staff to design, evaluate and manage projects that deliver co-benefits across climate, biodiversity and pollution objectives.
- Support the establishment of specialized technical units within key ministries to develop bankable multi-benefit project proposals, strengthen investment pipeline development, and systematically assess climate-biodiversity-pollution co-benefits in project appraisal, with long-term technical assistance from development partners.
- Develop pilot projects in priority sectors, including NbS, sustainable agriculture and climate-resilient infrastructure, to demonstrate synergistic approaches and facilitate learning.

- Support the development of local capital markets for sustainable finance, including by providing technical assistance to build enabling conditions, such as sound governance, stable macroeconomic frameworks and investor-ready project pipelines that attract private capital for synergistic investments.
- Deploy targeted credit enhancement instruments, including first-loss guarantees, subordinated tranches and blended risk-layering structures, specifically for NbS and biodiversity conservation projects, which face acute bankability challenges due to their public-good character and long investment return horizons.

Recommendations for regional cooperation

- Facilitate peer learning, harmonize standards, enable knowledge transfer and build capacity on synergistic finance.
- Work with governments and the private sector to harmonize green taxonomies to incorporate synergy activities, including developing standardized methodologies for assessing and valuing co-benefits across climate, biodiversity and pollution dimensions.
- Promote the adoption of internationally recognized corporate disclosure standards, including ISSB's IFRS S1 and S2 for climate and TNFD for biodiversity, to drive consistent capital allocation toward environmental goals and enable cross-border comparability of sustainability performance.

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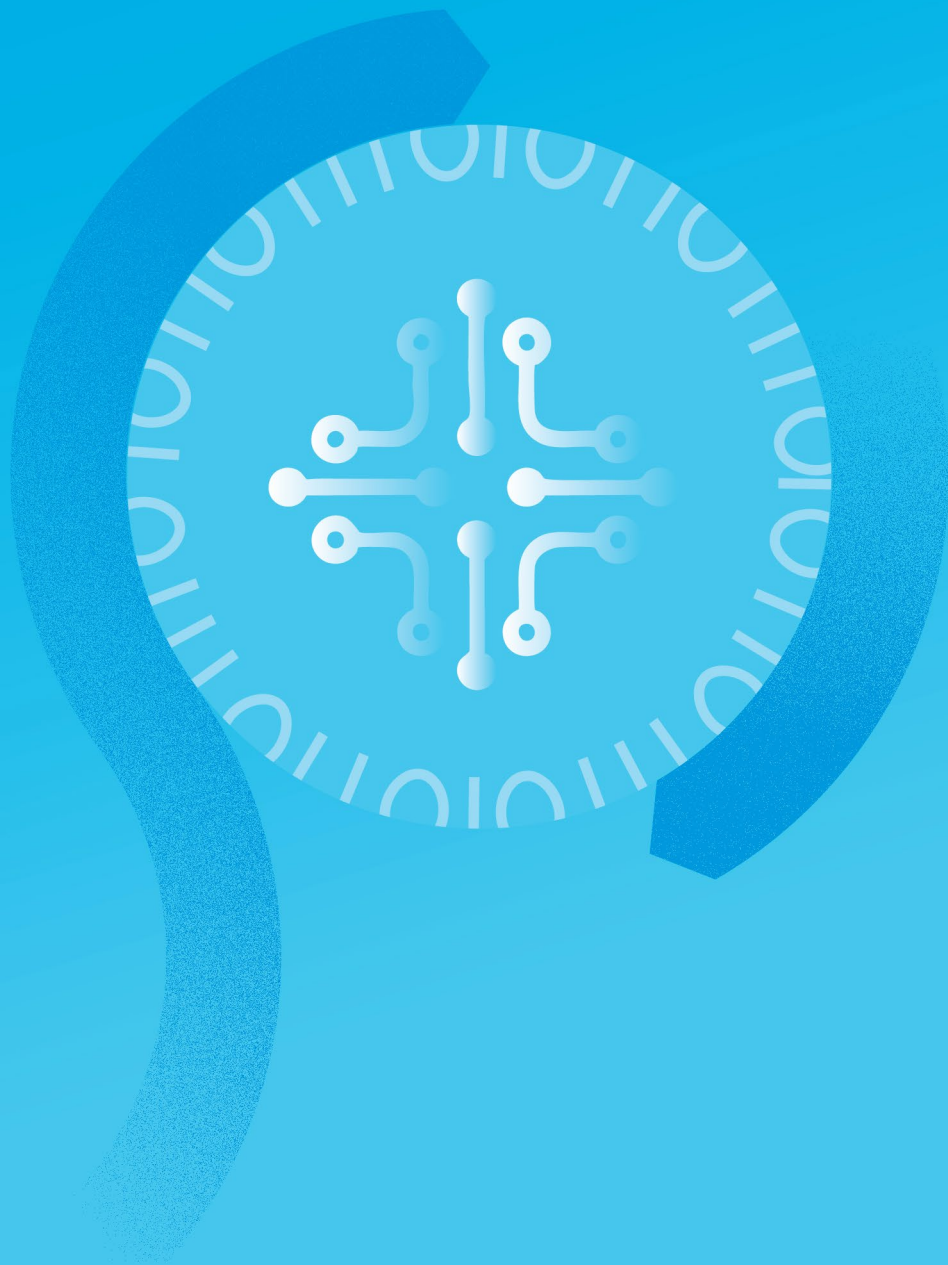
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CHAPTER 7

Drawing on data systems and analytical tools to strengthen synergistic policymaking



Key messages

- 1 **Data, tools and participation together enable synergy-oriented policymaking.** Integrated data, analytical tools and participatory mechanisms provide practical means to identify, design and scale synergistic solutions across the Sustainable Development Goals (SDGs). Their combined use is particularly important in resource-constrained and highly interconnected contexts like the Asia-Pacific region.
- 2 **A shift is underway from static reporting to dynamic, system-based decision-making.** Since 2015, SDG analysis in the Asia-Pacific region has evolved from static mapping toward dynamic, system-based approaches, including system dynamics, integrated assessments, nexus and interlinkage analyses.
- 3 **Data and tools can accelerate SDG progress by 1) revealing system interlinkages and leverage points; 2) designing and stress-testing integrated policy packages; and 3) supporting inclusive decision-making.** Examples from Australia, the Ganges-Brahmaputra-Meghna Basin (South Asia), New Zealand and Viet Nam demonstrate how these related functions serve to work across sectors and systems to strengthen performance on the SDGs in the Asia-Pacific region.
- 4 **National and local governments play complementary roles in operationalizing synergy-related tools.** National governments should embed data and tools within policymaking processes by investing in integrated data infrastructure, mandating *ex ante* screening of synergies and trade-offs in planning processes, strengthening inter-ministerial coordination and building analytical capacity. Local governments play a critical role in implementation by leveraging citizen-generated data and participatory platforms to support context-specific, adaptive decision-making.
- 5 **Regional organizations and development partners are key to scaling impact.** Regional organizations should strengthen shared statistical platforms and foster cross-border modelling for joint water-energy-food-climate nexus challenges. Development partners should promote interoperable, open-source standards and align finance, technology, capacity-building and governance support to sustain data tools as core infrastructure of SDG implementation rather than isolated, one-off technical exercises.

7.1 Introduction to synergies, data and tools

Achieving the Sustainable Development Goals (SDGs) in the Asia-Pacific region requires understanding the deeply interconnected nature of the triple planetary crisis: climate change, biodiversity loss and pollution, while advancing socioeconomic development. Progress depends not only on sectoral achievements, but on the ability of policymakers and other stakeholders to manage interactions among goals, sectors and systems. These interactions can generate both synergies and trade-offs across multiple scales, shaped by complex feedbacks within socioecological systems (Pradhan, 2017). Explicitly addressing such complexity requires moving beyond fragmented approaches toward integrated, systems-oriented policymaking. This transition, in turn, necessitates effective means of implementation. Among the means of implementation covered in this report, data systems and analytical tools play a critical role in supporting evidence-based decision-making, identifying interlinkages and informing synergistic policy responses.

Despite the growing availability of data and analytical tools, their practical use in policymaking remains limited and uneven. Decision-making is still largely dominated by siloed planning, with tools often applied in isolation rather than as part of an integrated framework. The limited use

of more integrated data and tools often reflects not just a lack of analytical capacity, but fragmented institutional arrangements, a shortage of guidance on tool selection and application, and weak integration of evidence into policy processes.

In addition, most existing data systems and analytical tools were not designed specifically for synergy-oriented policymaking, but systems thinking (e.g. water-energy-food nexus studies), integrated assessments (e.g. climate modelling), or specific policy analysis (e.g. environment-health research) (Pradhan, 2024). While these functions provide an essential foundation, they do not directly translate into actionable guidance for designing and implementing synergistic interventions. Closing this gap requires leveraging and repurposing existing tools to support the identification, prioritization and operationalization of synergies. The need to adapt existing tools is particularly pronounced in the Asia-Pacific region, where diverse institutional capacities, uneven data availability and strong transboundary interdependencies heighten the demands for practical, synergistic approaches.

Given this context, data systems and tools should be understood not merely as instruments for monitoring or analysis, but as components of a broader system-based decision-support architecture. When aligned with sustainability policy objectives, they perform three

related functions. First, they support the diagnosis of system interlinkages by revealing causal relationships and cross-sectoral dependencies. Second, they enable the design of integrated policy pathways through modelling, scenario analysis and simulation of policy options. Third, they facilitate the delivery and scaling of impact by supporting stakeholder engagement, participatory processes and the institutional embedding of data-driven approaches. Together, these three functions transform data and tools into practical enablers of synergy-oriented policymaking. The remainder of the chapter demonstrates how different types of tools can be employed and scaled in varying contexts in Asia and the Pacific. Grounded in regional experiences, the insights offered herein provide potentially transferable lessons for other parts of the world.

7.2 Synergistic approaches

Given the wide range of available synergistic approaches that are often developed for diverse analytical purposes, a simple organizational framework is needed to guide their practical application, enable their effective use and support their incorporation and scaling in integrated decision-making. This section introduces a framework that categorizes data systems and analytical tools as playing three roles: diagnosis, design and delivery. Diagnostic tools identify relationships and interaction patterns across SDGs and sectors, forming the basis for understanding system dynamics. Design tools enable the exploration of policy options through modelling and scenario analysis, helping to quantify synergies and trade-offs. Delivery tools support the operationalization of these insights by enabling coordination, stakeholder engagement and integration into policymaking processes (see also Chapter 8 for a review of similar functions from a governance perspective). Together, these three functions provide a structured approach to align data and tools with the practical requirements of synergy-oriented policymaking.

Diagnostic tools: Understanding system interlinkages

Effective synergy-oriented policymaking requires a clear understanding of how SDG targets, sectors and policy interventions interact. Diagnostic approaches create this understanding by identifying relationships, directional linkages and interaction patterns across systems, helping to reveal potential synergies, trade-offs and spillovers. This diagnostic function relies on two complementary components: analytical tools that structure and interpret interlinkages; and data systems that provide the empirical basis for analysis.

SDG interlinkage mapping and analytical tools

Understanding synergies and trade-offs across SDGs requires identifying how targets and policy interventions interact across sectors and scales. Interlinkage mapping and policy-alignment tools support this diagnostic function by structuring relationships, directional linkages and interaction patterns, helping policymakers identify leverage points and prioritize actions for integrated planning.

These tools vary in approach but are similarly intended to make system interactions visible. Many were originally developed for systems analysis or policy screening and can be adapted to support synergy-oriented policymaking (table 7.1).

While effective for identifying interaction patterns, these tools span qualitative, semi-quantitative and data-driven approaches, including those based on correlation analysis or combinations of literature review, expert judgement and empirical data. However, the tools generally do not assess the magnitude or timing of impacts or simulate policy outcomes. Therefore, they provide a foundation for diagnosis but need to be complemented by modelling approaches for policy design (table 7.1).

Table 7.1 Interlinkage mapping and analytical tools

Category	Content
Purpose and use	Identify relationships across SDGs, sectors and policies to support policy coherence, prioritization and integrated planning.
How they work	Use qualitative and semi-quantitative approaches, including expert judgement, literature-based mapping, cross-impact matrices and text analysis as well as correlation-based methods to structure relationships and assess policy alignment.
Synergy insights	Reveal synergies, trade-offs and directional linkages; identify interaction pathways and policy overlaps.
Strengths	Transparent; low data requirements; accessible for early-stage analysis and communication.
Limitations	Often qualitative or semi-quantitative; dependent on assumptions or expert judgement; limited dynamic analysis.
Examples (select)	Network-based platforms: IGES SDG Interlinkages Analysis & Visualization Tool (Zhou and Moinuddin, 2017). Expert/stakeholder-based tools: SEI SDG Synergies Tool (Weitz, Nilsson and Davis, 2018). Semantic/policy-alignment tools: EU SDG Mapping and Interlinkages Tools (European Commission, 2020); UNEP FI Interlinkages Mapping (UNEP FI, 2022); ESCAP SDG interlinkages visualization (ESCAP, 2022); UNDP Rapid Integrated Assessment (UNDP, 2017).

Source: Authors.

Data systems and enabling analytics

Reliable and accessible data are essential for diagnosing interactions across SDGs, including the identification of trends, spatial patterns and multiple pressures. Data systems and enabling analytics support this function by integrating official statistics, geospatial information, Earth observation and data-driven approaches to provide an empirical basis for understanding system dynamics.

These systems include SDG indicator platforms, Earth observation infrastructures and artificial intelligence-enabled analytics that process large and diverse datasets to reveal development patterns and emerging risks. In addition, Indigenous and local knowledge systems provide context-specific insights into socioecological interactions, complementing formal data sources at the national and regional scales, and enhancing the relevance of analysis (see also Chapter 3). Many of these systems were originally developed for monitoring, reporting or domain-specific analysis and can be adapted to support synergy-oriented policymaking (table 7.2).

While these approaches strengthen the evidence base for diagnosis, their ability to directly assess interactions remains limited. Data gaps, integration challenges and technical capacity constraints persist, and interpretation often requires complementary analytical tools (table 7.2).

Design tools: Systems and integrated modelling tools

Climate change, biodiversity loss and pollution are deeply interlinked, with shared drivers (e.g. land use, energy systems, agrochemical inputs) and policy responses (e.g. protected areas, renewable deployment, circular economy) often generating synergies or trade-offs across domains. Systems and integrated modelling tools support this design function by simulating these interactions and assessing how different policy combinations perform. In particular, these approaches can represent cross-sectoral linkages, test alternative scenarios and quantify the additional benefits of combined actions compared to individual measures using comparable metrics across environmental, economic and social dimensions (Doelman and others, 2022; Fujimori and others, 2019; van Soest and others, 2019).

A wide range of modelling approaches have been applied to analyse SDG interactions across global, regional, national and subnational contexts. These include Integrated Assessment Models (IAMs), system dynamics models, hybrid modelling approaches, statistical and Bayesian models, input-output models, bottom-up costing models, and other mathematical and sector-specific models (Allen, Metternicht and Wiedmann, 2016; Moyer and Hedden, 2020). Rather than providing an exhaustive review, this section focuses on two complementary approaches with

Table 7.2 Data systems and enabling analytics

Category	Content
Purpose and use	Provide harmonized statistical, geospatial and analytical data to support SDG monitoring, baseline assessment and identification of cross-sectoral patterns.
How they work	Integrate official statistics, Earth observation, artificial intelligence (AI)/machine learning and local knowledge to detect trends, spatial patterns and co-occurring conditions across systems.
Synergy insights	Identify hotspots and multiple pressures, and support analysis of cross-sectoral and cross-scale interactions.
Strengths	Broad coverage and comparability (indicator platforms); high spatial and temporal resolution (Earth observation); scalable analytics (AI); context-rich insights (Indigenous/local knowledge).
Limitations	Data gaps and inconsistencies; integration challenges; technical capacity requirements; need for validation (AI); limited ability to directly assess interactions without complementary tools.
Examples (select)	Indicator platforms: ESCAP SDG Gateway (ESCAP, 2022); UN SDG Indicators Database (UN DESA, 2023); ADB Key Indicators (ADB, 2023); SDSN SDG Index (Sachs and others, 2023). Earth observation: Google Earth Engine (Gorelick and others, 2017); Copernicus (European Commission, 2021); NASA EarthData (NASA, 2023); ARIES for SEEA (UN DESA, n.d.). AI and dashboards: SDG Mapper (European Commission, 2020); UNDP dashboards (UNDP, 2023); OECD Policy Coherence for Sustainable Development tools (UNEP, OECD, 2026). Indigenous/local knowledge: Participatory and community-based knowledge systems (IPBES, 2019).

Source: Authors.

distinct capabilities: 1) IAMs, which are widely used for long-term, multisector scenario analysis; and 2) system dynamic models, which are well suited for analysing feedbacks, policy interactions and system behaviour over time.

These approaches are complemented by sectoral planning tools such as the Low Emissions Analysis Platform (LEAP) and the Water Evaluation and Adaptation Planning (WEAP) system, which are widely applied to analyse transitions in energy, water and other systems, particularly at national and subnational levels. While originally developed for climate, resource or sectoral planning, these models can be applied to support synergy-oriented policymaking by evaluating integrated policy packages and identifying pathways that maximize overall benefits. In doing so, they provide a critical bridge between analytical capacity and practical policy design, complementing diagnostic tools and supporting more coherent and integrated SDG implementation.

Integrated Assessment Models

IAMs have been developed over several decades to analyse interactions between energy, the economy, climate and land systems, and are widely used for global and regional scenario analysis of climate mitigation, biodiversity and sustainable development (van Soest and others, 2019; Doelman and others, 2022;

Fujimori and others, 2019). IAMs integrate energy, land, water and economic components, and simulate long-term futures under alternative policy and technology pathways. Many include air pollution land-use modules and can be linked to biodiversity and health models to assess broader impacts (Leclère and others, 2020; van Vuuren and others, 2019).

Global IAMs, such as the Integrated Model to Assess the Global Environment (IMAGE), the Global Change Analysis Model (GCAM), the Model for Energy Supply Strategy Alternatives and their General Environmental Impact – Global Biosphere Management Model (MESSAGEix-GLOBIOM), and the Asia Pacific Integrated Model (AIM), provide multi-regional representations, while national variants are increasingly used to inform country-level strategies. Some models focus more specifically on interactions between climate mitigation and air pollution (e.g. Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) (see table 7.3).

To better capture economy-wide effects, IAMs are often coupled with macroeconomic models such as computable general equilibrium models. These integrated frameworks combine detailed representations of energy, land and climate systems with modelling of production, consumption and trade, enabling more comprehensive assessment of synergies and trade-offs across environmental and economic dimensions (Sörgel and others, 2021; Campagnolo and Davide, 2019).

Table 7.3 Integrated Assessment Models

Category	Content
Purpose and use	Analyse long-term policy pathways and interactions across energy, land, economy and environment; support integrated policy design at the global, regional and national levels (e.g. climate mitigation pathways aligned with 1.5°C – 2°C targets).
How they work	Use scenario-based modelling to compare combined policy packages (e.g. renewables, land-use change and methane reduction) with single-policy cases, apply multi-objective analysis to explore trade-offs across outcomes (e.g. emissions and biodiversity), and attribute impacts to different sectors or policy components.
Synergy insights	Quantify synergies and trade-offs across key outcomes (e.g. emissions, biodiversity, economic impacts); identify where combined policies deliver greater benefits than individual measures.
Strengths	Whole-system coverage across energy-land-economy systems; robust for long-term pathways (e.g. to 2050–2100); support integrated policy package design and cross-sector analysis.
Limitations	High complexity; data- and capacity-intensive; coarse spatial resolution; results depend on assumptions and scenario design.
Examples (select)	Global models: IMAGE; GCAM; MESSAGEix, including MESSAGE–GLOBIUM; AIM (van Soest and others, 2019; Fujimori and others, 2019). National applications: AIM country models (e.g. Indonesia, Thailand, Viet Nam); GCAM country variants (e.g. China, India); the Climate Change Integrated Assessment Model (C3IAM) of China. Linked frameworks: MESSAGE–MACRO; AIM/CGE; GAINS; Global Trade and Environment Model (GTEM) (Sörgel and others, 2021; Campagnolo and Davide, 2019).

Source: Authors.

System dynamics models

System dynamics models are mathematical simulation tools used to understand complex system behaviours, including interactions among variables and feedback effects (Sterman, 2002). They represent systems as stocks, flows and feedback loops, capturing non-linear dynamics, delays and path dependence across interconnected domains (e.g. energy, agriculture, health and ecosystems).

System dynamics models have been applied across scales to analyse synergies and trade-offs between economic, social and environmental objectives, including global modelling of food systems and long-term development pathways (Eker, Reese and Obersteiner, 2019; Moallemi and others, 2022). At the national level, particularly in the Asia-Pacific region, these models are widely used to assess policy scenarios for achieving the SDGs and climate targets, enabling evaluation of individual policies and policy packages (Allen and others, 2021; 2024; Pedercini and others, 2019).

SDG models are also applied at subnational and local scales through participatory processes, supporting policy design in specific contexts such as air quality management (Chiang Rai Province, Thailand and Vientiane Prefecture, the Lao People’s Democratic Republic). By explicitly representing feedback and system structure, they help identify leverage points and assess how policy combinations influence system trajectories over time (table 7.4).

Delivery tools: Practical tools for enabling synergies

Synergy-oriented implementation requires coordinated actions that deliver multiple benefits while managing trade-offs. In this context, enabling synergies refers to the practical tools and processes that support the application of integrated approaches across sectors. This section focuses on delivery-oriented tools, including cross-sectoral coordination, stakeholder engagement, citizen-generated data and uncertainty management that enable policymakers to translate analytical insights into action (see table 7.5 for different types of delivery tools).

These tools support the alignment of actors, integration of evidence into decision-making and adaptive responses in complex policy contexts. Their application should be fit-for-purpose, ranging from rapid qualitative assessments of interlinkages (Pradhan, 2024) to more detailed and resource-intensive analyses for long-term policy design and implementation. In practice, their effectiveness depends on integration into policy processes and planning frameworks, such as Nationally Determined Contributions (NDCs), National Biodiversity Strategy and Action Plans (NBSAPs) and national development plans in many countries (see Chapters 2 and 3). The tools are also used to inform resource allocation decisions in countries such as Uzbekistan where the results of a public budget tagging exercise are published as a citizen’s budget.

Table 7.4 System dynamics models

Category	Content
Purpose and use	Support national and subnational scenario analysis and strategy development; assess policy pathways and interactions across economic, social and environmental systems (e.g. SDG progress to 2030–2050).
How they work	Use stock-flow structures and feedback loops to simulate dynamic interactions across systems, capturing delays and non-linear responses; analyse policy scenarios to show how actions in one domain propagate over time (e.g. energy or waste interventions affecting air quality, health and economic outcomes).
Synergy insights	Identify reinforcing and balancing feedbacks, and quantify how policy combinations influence multiple outcomes over time (e.g. energy transition reducing emissions while improving health and productivity); reveal indirect effects and unintended consequences across interconnected systems.
Strengths	Transparent causal logic; flexible for country-specific applications; supports stakeholder engagement and policy learning; useful for testing policy packages and implementation pathways.
Limitations	Results depend on model structure and assumptions; require validation and sensitivity analysis; typically coarser spatial detail unless linked to spatial models.
Examples (select)	National/global models: Integrated Sustainable Development Goals (iSDG) model / iSDG Simulator (e.g. Australia, China, Fiji); Full of Economic-Environment Linkages and Integration dX/dt (FeLiX); Framework for Integrated Resource Development Analysis (FRIDA); World Integrated Model of Global Dynamics (WILIAM) (Collste, Pedercini and Cornell, 2017; Allen and others, 2021). Subnational/local models: Integrated Air Pollution (IAP) model (e.g. Thailand, the Lao People’s Democratic Republic).

Source: Authors.

Table 7.5 Practical tools for enabling synergies

Category	Content
Cross-sectoral coordination tools	
Purpose and use	Align policies across sectors to reduce burden-shifting and unlock co-benefits.
How they work	Use joint targets and shared indicators, inter-ministerial working groups, cross-sector pilot financing and ex-ante synergy/trade-off screening.
Synergy insights	Identify where coordinated policies deliver multiple benefits (e.g. mitigation-air pollution pathways; water-energy solutions such as urine-separating toilets).
Strengths	Improves policy coherence and integrated outcomes.
Limitations	Requires sustained institutional coordination and alignment.
Examples (select)	• SEI SDG Synergies Tool (Weitz, Nilsson and Davis, 2014). • NDC-SDG Connections (SEI and IDOS, 2020). • OECD Policy Coherence for Sustainable Development (UNEP, OECD, 2026).
Stakeholder engagement tools	
Purpose and use	Enable co-production of solutions by aligning actors, mandates and incentives.
How they work	Use structured dialogue and partnership frameworks to map interlinkages, assign roles and formalize accountability.
Synergy insights	Identify context-specific synergies and feasible policy entry points.
Strengths	Enhances legitimacy and feasibility.
Limitations	Can be time- and resource-intensive and require managing power imbalances.
Examples (select)	• Broad-based partnership approach (Horan, 2022; Bernabé and Park, 2025). • UNDP Accelerator Labs (UNDP, 2026).
Citizen science tools	
Purpose and use	Close data gaps and strengthen participation through community-based data generation.
How they work	Expands data coverage and inclusiveness but requires quality assurance and sustained coordination.
Synergy insight	Use standardized protocols, training and open platforms (e.g. air sensors, urban heat and flood-risk mapping).
Strengths	Reveal localized interactions across environment, health and risk systems and increase ownership.
Limitations	Can be time intensive and difficult to scale.
Examples (select)	• PurpleAir and OpenAQ (air quality) (PurpleAir, 2026; OpenAQ, 2026). • OpenLitterMap (waste mapping) (OpenLitterMap, 2026).
Uncertainty management tools	
Purpose and use	Support robust decision-making under uncertainty in data, models and implementation.
How they work	Apply scenario analysis, sensitivity testing and adaptive policy design (e.g. triggers and periodic review).
Synergy insights	Assess robustness of policy combinations and identify trade-offs under different conditions (e.g. renewable energy policies affecting emissions and productivity).
Strengths	Improves resilience of policy responses.
Limitations	Adds analytical complexity and requires clear communication.
Examples (select)	• Participatory foresight models (UNDP, 2023). • Monte Carlo simulations (Moyer and Bohl, 2019).

7.3 Case studies

This section presents case studies from across the Asia-Pacific region that demonstrate how data systems and tools are applied in practice to support synergy-oriented policymaking. The cases are selected to reflect diverse policy contexts, including national planning, cross-boundary coordination and subnational implementation, and to illustrate different modes of tool application, from diagnostic analysis to scenario-based modelling and delivery-oriented mechanisms. They provide empirical evidence of how tools can be used and integrated into decision-making and implementation processes. The summary table (table 7.6) provides a comparative overview of key features across cases, including areas of synergies, approaches, actors and enabling conditions.

The case studies are organized to illustrate how data systems and tools are applied across different policy contexts and scales. Three complementary application domains are highlighted: national policy integration and planning, sectoral and cross-boundary coordination, and subnational implementation through participatory processes. This structure reflects how tools are used in practice; from informing national strategies to addressing cross-sectoral and transboundary interdependencies, and to supporting operational decision-making on the ground.

Across the functions highlighted in the previous section (design, diagnosis and delivery), the cases demonstrate diverse modes of application, including diagnostic analysis, scenario-based modelling and delivery-

Table 7.6 Summary of the case studies

Areas of synergies	Synergistic solutions/approaches	Key actors	Enablers
Case study: SDG interlinkages tool for national sustainable consumption and production (SCP) action planning in Viet Nam SDGs: 6 7 8 9 12 13 17			
• Resource efficiency • Sustainable production and consumption • Waste management • Green trade	• Interlinkage mapping to identify leverage points, prioritize policy measures and align SCP actions across sectors	• Ministry of Industry and Trade • Line ministries • IGES • SWITCH-Asia partners	• Availability of SDG data and national targets • Integration of data and analyses into planning processes • Technical support
Case study: iSDG model for integrated SDG scenario planning in Australia SDGs: 1 2 6 7 8 9 10 11 12 13 15			
• Energy-climate-economy • Inequality-growth • Food-water-ecosystems	• System dynamics modelling to test policy packages and quantify synergies and trade-offs across multiple indicators	• Government agencies • Millennium Institute • Research institutions	• Integrated datasets • Modelling capacity • Scenario-based planning frameworks
Case study: Telecoupling analysis for assessing reforestation spillovers in China SDGs: 2 15			
• Forest restoration • Global supply chains • Land-use and biodiversity	• Telecoupling framework and causal analysis to trace cross-border spillovers and assess impacts on SDGs	• Research institutions • International research networks	• Cross-country data integration • Interdisciplinary analytical frameworks
Case study: Nexus approaches for regional cooperation in the Ganges-Brahmaputra-Meghna Basin SDGs: 2 6 7 17			
• Water-energy-food nexus • Regional energy cooperation • Water security	• Regional cooperation mechanisms and coordinated infrastructure (e.g. power grids) supported by nexus approaches	• Governments of Bangladesh, Bhutan, India and Nepal • BIMSTEC • World Bank	• Institutional coordination platforms • Cross-border agreements • Shared infrastructure
Case study: Citizen science for marine pollution and environmental monitoring in New Zealand SDGs: 14 17			
• Marine ecosystem protection • Waste reduction • Public engagement	• Citizen science (litter intelligence) with standardized protocols for data collection, monitoring and SDG reporting	• Sustainable Coastlines • Ministry for the Environment • Stats NZ • Communities	• Standardized methodologies • Training and governance systems • Open data platforms

oriented mechanisms such as coordination platforms and citizen-generated data systems. They cover a range of geographic contexts across the Asia-Pacific region, reflecting different development conditions and governance settings.

Each case also highlights how tools are applied in practice, focusing on policy processes, synergies and trade-offs, and key lessons for decision-making. Together, they show how existing tools can be adapted and repurposed to support synergy-oriented policymaking, while also revealing challenges related to data, capacity and coordination.

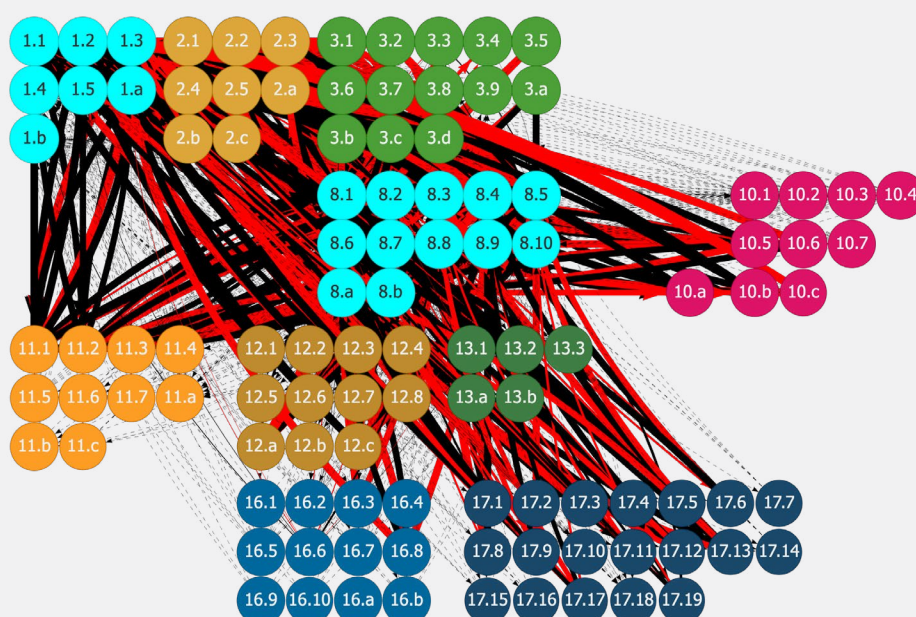
SDG interlinkages tool for national sustainable consumption and production action planning in Viet Nam

The SDG Interlinkages Analysis and Visualisation Tool has supported integrated planning across multiple countries, particularly in Asia, by visualizing synergies, trade-offs and leverage points among SDG targets (Zhou and Moinuddin, 2017; 2023; Zhou, Moinuddin and Li, 2021). It has been applied in national planning and review processes, including the SDG road map for Indonesia and its Voluntary National Reviews (VNRs) (see figure 7.1), as well as in countries such as Ghana (Indonesia, 2019, 2021; Ghana, 2019). The tool has also been used in subnational contexts, including river basin planning in China and analyses of urban-rural linkages in Ghana (Zhou and others, 2022; Baffoe and others, 2021).

In Viet Nam, the tool has been applied to support the development of the National Action Plan on Sustainable Consumption and Production (2021–2030), providing a structured approach to align sustainable consumption and production measures with SDG targets and national priorities (P. King and others, 2020). In practice, the tool was used to map interactions between proposed policy measures, such as eco-design, resource efficiency, green supply chains and sustainable consumption, and SDG targets. By visualizing these relationships, policymakers were able to identify “synergy hotspots”, where individual interventions could generate reinforcing effects across multiple objectives, as well as areas where trade-offs might arise. This enabled more informed prioritization of policy measures and improved coordination across ministries responsible for energy, industry, environment and trade.

The analysis highlights several key SDG synergies. First, sustainable production and resource efficiency measures jointly advance water, energy and material efficiency while strengthening innovation and industrial upgrading. Second, improvements in supply chains and distribution systems enhance food security, reduce losses and waste, and support green trade and economic resilience. Third, sustainable consumption measures, including green public procurement and consumer awareness, drive behavioural change and reinforce demand for sustainable products and services. More broadly, the tool identifies synergy hotspots linking ecosystem protection, climate resilience, infrastructure and governance, while also revealing trade-offs associated with unsustainable resource use and agricultural practices.

Figure 7.1 The linkages between select SDGs in the Sustainable Consumption and Production National Action Plan of Viet Nam



Source: P. King, and others, “Development of the National Action Plan on Sustainable Consumption and Production (2021–2030) in Viet Nam: An assessment of the progress in 2016 – 2020 and recommendations for 2021–2030”, SWITCH-Asia SCP Facility, Viet Nam, 2020.

A key lesson from this case is that interlinkage mapping tools can be repurposed from analytical assessment to policy planning, supporting the selection of integrated policy packages rather than isolated measures. However, data gaps limit the quantification of some interactions, highlighting the need to combine such tools with complementary data systems and modelling approaches.

iSDG model for integrated SDG scenario planning in Australia

National-scale system dynamics modelling has been applied in Australia through the Transforming Australia project to analyse interactions among SDGs and assess the impacts of policy scenarios across economic, social and environmental systems (Millennium Institute, 2022; Allen and others, 2024). The analysis is based on the iSDG-Australia model (version 2.0), which simulates how policy interventions affect around 80 SDG-related indicators over time.

In practice, the model is used to test integrated policy packages rather than individual measures, allowing policymakers to compare how combinations of interventions perform across multiple objectives. These include investments in renewable energy, energy efficiency, sustainable agriculture, social protection and ecosystem restoration. By running scenario simulations, the model quantifies both direct and indirect impacts, enabling assessment of system-wide synergies and trade-offs.

The results show that integrated policy packages can generate substantial cross-sectoral benefits. For example, a combined energy decarbonization pathway comprising renewable subsidies, electrification and the phase-out of coal can achieve close to a 100 per cent renewable electricity and around a 70 per cent renewable share in final energy consumption, while reducing energy intensity by approximately 60 per cent and significantly lowering greenhouse gas (GHG) emissions and air pollution. These changes not only contribute to climate and energy goals but also support economic transformation through green industry development.

Similarly, policies combining social protection, progressive taxation and investment in green infrastructure can halve poverty rates, reduce income inequality by around 30 per cent and nearly double manufacturing output, while lowering material consumption by one-third. In the food system, investments in sustainable agriculture and water efficiency can increase sustainably managed land, reduce fertilizer use by about 30 per cent, improve water efficiency by over 20 per cent and cut food poverty by more than half. Environmental restoration measures, including reforestation and ecosystem protection, further contribute to biodiversity recovery and carbon sequestration, supporting long-term resilience.

These results highlight several key SDG synergies: 1) energy transition policies jointly advance climate mitigation, air quality and economic development; 2) social and economic policies can simultaneously reduce inequality, enhance productivity and support sustainable consumption; and 3) integrated land and water management can deliver benefits across food security, resource efficiency and ecosystem protection.

A strength of this approach is its ability to quantify synergies and trade-offs across multiple sectors using comparable indicators, supporting evidence-based prioritization of policy packages. However, the model requires substantial data, calibration and technical capacity, which can limit accessibility and uptake in policy processes.

Telecoupling analysis for assessing reforestation spillovers in China

Sustainability policies implemented in one country can generate impacts beyond national boundaries, creating cross-border interactions that influence SDG outcomes elsewhere. In China, forest restoration policies provide a clear example of such dynamics, where national-level interventions produce both synergies and trade-offs across regions.

To analyse these cross-boundary effects, a multi-method approach was applied combining a telecoupling framework, causal loop diagrams and an SDG-based assessment (Downing and others, 2021). The telecoupling framework was used to trace linkages between reforestation efforts in China and global supply chains, capturing flows of commodities, land-use changes and environmental impacts across regions (Galaz and others, 2012). Causal loop diagrams helped visualize feedback and interactions among key system components, while the SDG-based framework integrated qualitative and quantitative evidence to assess impacts on specific goals and targets.

In practice, this approach enables policymakers and researchers to extend analysis beyond national boundaries, identifying how domestic policies interact with global production and trade systems. It provides a structured way to detect unintended spillovers and assess whether policy outcomes generate synergies or trade-offs across countries and sectors.

The results reveal that forest restoration and ecosystem protection programmes in China generated strong domestic synergies, including increased forest cover, reduced soil erosion and desertification, and improved flood regulation. However, these gains are partly offset by international spillovers. Increased demand for commodities such as palm oil and rubber has contributed to deforestation in countries such as Indonesia and Malaysia, creating trade-offs between ecosystem conservation and agricultural production.

This case highlights a critical dimension of SDG interlinkages: synergies achieved at the national level may generate trade-offs elsewhere if cross-boundary interactions are not considered. It also underscores the importance of diagnostic tools that capture spillovers across regions and sectors, supporting more comprehensive and globally coherent policy assessment. At the same time, the approach requires integration of diverse datasets and cross-country information, which can be challenging and may limit its routine application in policymaking.

Nexus approaches for regional cooperation in the Ganges-Brahmaputra-Meghna Basin

The Ganges-Brahmaputra-Meghna basin, shared by Bangladesh, Bhutan, India and Nepal, is one of the largest transboundary river systems, supporting around 700 million people (Ahmad and others, 2001). Despite abundant natural resources, the basin faces mounting pressures from population growth, urbanization and climate change, leading to severe seasonal imbalances; flooding during the monsoon and water scarcity in the dry season. Historically, fragmented management approaches overlooked shared benefits, contributing to rising tensions among countries (Rasul, 2014).

In response, a shift towards integrated, nexus-based regional cooperation has been promoted to address interdependencies across water, energy, food and ecosystems. Moving beyond water allocation negotiations, an intergovernmental task force established in 2008 advanced cooperation through initiatives such as the South Asia Growth Quadrangle (Rasul, 2014). This approach is supported by regional platforms including the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), which established the BIMSTEC Energy Centre in 2011 to facilitate coordination on energy security, renewable energy and cross-border electricity trade (BIMSTEC, 2025).

In practice, these mechanisms act as delivery-oriented tools, enabling joint planning, information sharing and coordinated infrastructure development. Regional transmission networks have been developed to support cross-border electricity exchange, allowing surplus hydropower from Bhutan and Nepal to be exported to Bangladesh and India, strengthening regional energy integration.

These efforts generate synergies across sectors. Integrated water and energy management improves water-use efficiency and agricultural productivity, increasing food security. Regional energy cooperation enhances access to reliable energy while reducing environmental pressures. Strengthened partnerships further support coordinated governance and socioeconomic development across the basin.

This case demonstrates how regional cooperation platforms can operationalize nexus approaches by aligning policies and investments across water, energy and food systems, and countries (see also Chapter 3). However, their effectiveness depends on sustained political commitment, institutional coordination and data-sharing, which remain ongoing challenges in transboundary contexts.

Citizen science for marine pollution and environmental monitoring in New Zealand

Marine pollution, particularly plastic waste, poses growing risks to coastal ecosystems and biodiversity. In New Zealand, the Litter Intelligence Programme provides an example of strengthening the science-policy interface through citizen-generated data. Developed in 2018 by the non-profit Sustainable Coastlines, with support from the Ministry for the Environment and in collaboration with Stats New Zealand and the Department of Conservation, this is the first national litter monitoring system based on voluntary citizen participation (Sustainable Coastlines, 2025b).

The programme applies standardized scientific methods adapted from the United Nations Environment Programme and the Intergovernmental Oceanographic Commission to ensure data consistency and comparability. Citizen scientists are trained in litter classification, survey protocols and data recording, and conduct quarterly monitoring at more than 100 beaches nationwide (Sustainable Coastlines, 2025a). Surveys follow consistent methods across sites and over time, while a data and methodology governance group oversees quality assurance and continuous improvement. Data, tools and educational materials are openly shared through the Litter Intelligence platform.

In practice, this system enables large-scale, continuous environmental data collection beyond what is feasible through official monitoring alone, while embedding participation and learning within communities. The data have been used for national SDG reporting, including SDG indicator 14.1.1 on marine plastic pollution, and were incorporated into the Ministry for the Environment's *Our Marine Environment* report (New Zealand, Ministry for the Environment and Stats NZ, 2019).

This case highlights synergies across marine ecosystem protection, waste reduction and public engagement. Citizen science not only strengthens the evidence base for policymaking, but also raises awareness and encourages behavioural change, linking environmental monitoring with education and community action.

A key insight is that participatory data systems can complement formal statistics and expand the usability of environmental information, particularly where monitoring capacity is limited. However, maintaining data quality, standardization and sustained engagement is essential for effective integration into policy processes.

7.4 Enablers for scaling and replication

The effectiveness of data systems and analytical tools depends not only on their technical capabilities, but on the enabling conditions that support their integration and sustained use in policymaking. This section examines the conditions that enable tools to move from isolated analytical use to system-wide application, supporting more coherent and synergy-oriented decision-making.

How and where tools are used affects their application and scaling

A key lesson from this chapter is that it is not always necessary to create a new tool. Rather, repurposing existing tools often offers a practical pathway for their uptake and scaling. Instead of developing entirely new analytical approaches, several cases demonstrate how existing tools are adapted to new functions. Interlinkage mapping tools are used for policy prioritization, spatial zoning systems are applied to financial risk screening and citizen science platforms are integrated into national reporting.

This suggests that the main constraint for application, replication and scaling is not the availability of tools, but the ability to translate and adapt them across policy domains and user groups. Repurposing enables tools to move from expert-driven analysis to broader use in governance, business and community contexts, significantly expanding their impact.

A related insight is that the context in which a tool is used can also influence its scalability. More concretely, extending analysis beyond sectoral and national boundaries to capture system-wide interdependencies and spillovers can be an effective strategy to influence change at scale. The China telecoupling case demonstrates that national-level synergies can generate unintended trade-offs elsewhere, revealing the limitations of domestic policy assessments. Similarly, the Ganges-Brahmaputra-Meghna basin case shows that managing water, energy and food systems require coordination across countries, while the eco-zoning case highlights how spatial data can link ecological constraints with supply chain and financial decisions.

These cases demonstrate that synergy-oriented policymaking requires tools that can operate across: sectors (water-energy-food ecosystems), scales (local-national-regional-global) and systems (production-consumption-trade). This expands the role of tools from analysing isolated interactions to supporting system-level coherence.

Another lesson from the chapter is that data and models alone are insufficient to deliver and scale synergies. Their impact depends on human processes and ownership that connect evidence to action. Across different cases, stakeholder engagement emerges as a critical factor for

ownership and for spreading success. In New Zealand, citizen science not only generates data but also drives behavioural change and policy awareness with the potential for larger scale impacts. In the Ganges-Brahmaputra-Meghna basin, regional cooperation mechanisms enable collective decision-making across countries.

These examples highlight that tools are most effective when combined with participatory processes, institutional coordination mechanisms, and feedback and learning cycles. This shifts the focus from tools as technical solutions to tools as part of sociotechnical systems.

Institutional foundations for uptake

Data and tools can be understood as core infrastructure for integrated decision-making; however, their effectiveness and scalability also depend on institutional conditions that enable their integration into policy systems rather than their use as isolated technical exercises.

A critical enabling condition is the embedding of data and modelling approaches within formal policy and planning processes. When tools inform national development planning, climate strategies such as NDCs and LT-LEDS, biodiversity strategies, pollution control frameworks and urban planning, they become part of routine governance. This enables their outputs to influence policy prioritization, resource allocation and implementation pathways in a continuous and iterative manner. Without such integration, tools often remain *ad hoc* analytical exercises with limited policy impact.

Across the case studies explored in this and other chapters, tools evolve from standalone analytical instruments into components of broader decision systems. In Viet Nam, for instance, interlinkage mapping moves beyond visualization to guide policy prioritization. In Australia, system dynamics modelling is used not only for analysis but to compare policy packages and inform strategic choices. In Sri Lanka from Chapter 3, simulation tools are fully integrated into institutional routines, directly shaping seasonal resource allocation decisions.

This progression illustrates a continuum from analysis to planning to operational decision-making, where the value of tools increases as they become embedded in governance processes. It also suggests that scaling impact does not necessarily require more complex tools, but rather stronger integration into existing decision frameworks.

Institutional coordination and the science-policy interface are equally important. Fragmented institutional arrangements and uneven analytical capacity can constrain the integration of scientific evidence into policymaking, limiting the ability of governments to

conduct integrated cross-sectoral analysis (Allen and others, 2021). Strengthening institutional connections between scientific communities and policymakers is therefore essential for translating analytical insights into actionable guidance (Pradhan, 2024). Regular interaction among ministries, statistical agencies, local authorities, research institutions and societal actors can support the incorporation of data and modelling outputs into policy design, implementation and evaluation.

A key lesson from this chapter is that it is not always necessary to create a new tool. Rather, repurposing existing tools often offers a practical pathway for their uptake and scaling.

Accessible and interoperable data systems form another foundational condition. Greater transparency and accessibility of data improve analytical quality, facilitate coordination across institutions and enhance accountability. However, data fragmentation, inconsistencies and limited sharing mechanisms remain common challenges. Strengthening data infrastructure requires not only improving data quality and harmonization, but also enabling interoperability across sectors and governance levels. In this context, citizen-generated data and community monitoring initiatives can complement official statistics where formal systems are limited, provided that appropriate quality assurance and governance mechanisms are in place.

At the same time, ongoing digitalization, including sensor networks, geospatial infrastructures and cloud-based platforms expands the capacity to integrate diverse datasets and support near-real-time analysis. These developments enhance the ability of data systems and analytical tools to operate across domains and scales, supporting more comprehensive and system-level decision-making.

Complementarity enabling conditions for scaling

While institutional conditions provide the foundation for integrating data systems and analytical tools into policymaking, their effective use and scaling depend on a broader set of complementary factors that sustain data systems and modelling platforms over time. These factors shape whether tools can be applied consistently, adapted across contexts and extended to wider policy domains.

A key requirement in this connection is the availability of financial resources to establish and maintain statistical systems, data infrastructures and modelling platforms that support integrated analysis and evidence-based

policymaking (see also Chapter 6). Sustained investment is necessary not only for data collection and system development, but also for the continuous updating, maintenance and expansion of analytical capabilities.

At the same time, technology and analytical systems, including remote sensing, geospatial information systems, cloud computing and AI, have significantly expanded the capacity to integrate and analyse large and diverse datasets. These technologies enhance modelling, scenario analysis and policy evaluation, enabling more timely and comprehensive assessments across sectors and scales. However, their effective use depends on appropriate institutional arrangements and technical capacity.

Human capacity remains a critical constraint. Many countries continue to face shortages of expertise required to operate modelling tools, interpret results and apply evidence to policymaking. Strengthening data literacy, technical skills and institutional learning is therefore essential. This includes not only formal training, but also sustained collaboration between governments, research institutions and other stakeholders to support knowledge exchange and co-development of analytical approaches.

Operational coordination mechanisms further support the effective use and scaling of tools across sectors and policy domains. Inter-ministerial platforms, shared indicators, common data standards and *ex ante* policy assessment frameworks enable consistent application of data systems and modelling approaches, reducing fragmentation and supporting more coherent policies.

International cooperation also plays an important role. Many environmental challenges are transboundary and regional data platforms, cross-border modelling initiatives and shared analytical methodologies can improve comparability and policy coordination. Understanding interactions among the SDGs can further support coherent policy prioritization and integrated decision-making across sectors and governance levels (Bennich, Weitz and Carlsen, 2020).

Finally, growing engagement with the private sector contributes to expanding the scope and availability of data. Evolving corporate disclosure and sustainability reporting frameworks related to climate and nature are improving the availability and comparability of private-sector data, reinforcing the role of data-driven analysis in both public and economic decision-making (see Chapter 6).

These complementary factors highlight that scaling the use of data systems and analytical tools requires alignment across financial resources, technological capabilities, human capacity and coordination mechanisms. Strengthening these conditions enables tools not only to be used effectively, but also to be sustained, adapted and expanded across policy contexts and governance levels.

7.5 Key insights and recommended actions

Three overarching insights emerge from the analysis of tools, case applications and enabling conditions.

First, accelerating progress on the SDGs requires a shift from static reporting to dynamic, systems-based decision-making. Tools such as integrated assessment models and system-based approaches enable policymakers to identify synergy hotspots, anticipate trade-offs and evaluate the combined effects of policy packages before implementation. This shift is essential for managing complex interdependencies across climate, biodiversity, pollution and socioeconomic systems.

Second, the effectiveness of data and analytical tools depends on their integration with participatory and institutional processes. Across cases, the most impactful applications combine quantitative analysis with stakeholder engagement, citizen-generated data and cross-sectoral coordination. This integration enhances the legitimacy, usability and policy relevance of data, ensuring that analytical insights translate into real-world decisions.

Third, scaling the impact of data systems and tools requires their institutionalization within broader systems of implementation. Tools are most effective when embedded in policy frameworks, supported by interoperable data systems and aligned with finance, capacity-building and governance mechanisms. Without such enabling conditions, tools risk remaining underutilized, regardless of their technical sophistication.

Building on these insights, the following actions are proposed to strengthen the uptake, application and scaling of data systems and analytical tools.

Recommendations for national governments

- Invest in integrated data infrastructure and digital platforms that move beyond static reporting towards dynamic planning and scenario analysis.
- Mandate *ex ante* screening of policy synergies and trade-offs, supported by inter-ministerial coordination mechanisms, to reduce policy fragmentation and avoid unintended impacts.
- Build technical and institutional capacity, including data literacy, modelling skills and cross-sectoral coordination, for effective and sustained use.

Recommendations for local governments

- Formalize the use of citizen-generated data and participatory modelling to address data gaps and support real-time, context-specific decision-making.
- Establish structured platforms for stakeholder engagement beyond consultation. This can enable co-production of solutions in areas such as urban planning, disaster risk management and public health, while enhancing community ownership and behavioural change.

Recommendations for development partners

- Align finance, technology transfer and capacity-building efforts to strengthen national data systems and analytical capabilities.
- Promote open-source tools, interoperable data standards and comparable metrics across domains can facilitate wider uptake and benchmarking.
- Play a catalytic role in supporting innovation, knowledge exchange and partnerships that extend tool use across sectors and stakeholders.

Recommendations for regional cooperation

- Support the development of shared data systems, harmonized indicators and cross-border analytical frameworks to assess spillovers and coordinate responses.
- Strengthen regional statistical platforms and nexus-based approaches to improve coherence in managing water, energy, food and environmental systems across countries.

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CHAPTER 8

Strengthening governance to advance synergies



Key messages

- 1 **By breaking down siloes, governance can unlock the transformative potential of synergies in Asia and the Pacific.** Governance arrangements that enable different agencies and stakeholders to work across different levels, sectors and sustainability domains are critical to the implementation and scaling of synergistic solutions.
- 2 **The Asia-Pacific region is diverse; modes of governance need to account for this diversity.** Leveraging synergies requires understanding the context and existing levels of collaboration and coordination, allowing policymakers to sequence synergistic interventions toward progressively higher levels of impact.
- 3 **Tactical modes of governance offer a good starting point for advancing synergies.** For contexts where synergies face challenges or where whole-of-government approaches are not yet feasible, tactical modes of governance allow stakeholders to experiment and learn through piloting boundary-spanning solutions, often at the local level.
- 4 **Strategic modes of governance can raise ambition levels on synergies.** For governance contexts where stakeholders are already testing synergies, strategic forms of governance can mobilize the resources and forge the multi-stakeholder partnerships required for greater cross-sectoral, multilevel cooperation.
- 5 **Transformative modes of governance can institutionalize synergies.** For governance contexts where synergistic initiatives are more common and stakeholder buy-in is stronger, transformative governance modes offer formal structures and clear incentives to institutionalize cross-sectoral, multilevel cooperation, including through budget tagging, ministerial co-leadership and joint implementation plans.
- 6 **Regional bodies and international development partners can play an important role in building governance capacities for cross-boundary cooperation on synergies.** Regional platforms can enable knowledge and data-sharing across jurisdictions, and establish shared goals and partnerships to support synergistic solutions, particularly in resource-constrained settings. Development partners can provide funding and technical assistance that support synergistic action by focusing resources on integration and collaboration across sectors, and levels of government, including responses to multilateral environmental agreements (MEAs).

8.1 Introduction to synergies and governance

The previous chapters underscored that addressing climate, biodiversity and pollution crises together can generate synergies and accelerate progress on the Sustainable Development Goals (SDGs). Implementing synergistic solutions, however, require a range of strategies and mechanisms that can break down silos and facilitate interactions across stakeholders working at different temporal, spatial and sectoral scales. These include institutions that support vertical and horizontal coordination as well as related mandates, incentives, accountability and compliance mechanisms. In short, a well-designed set of governance institutions and mechanisms can contribute to transformations or “fundamental reorganisation[s] of large-scale socioeconomic systems” (Hölscher, Wittmayer and Lorbach, 2018). Chapters 5 and 6 examined finance, as well as data and tools, as key means of implementation for supporting these transformations. This chapter focuses on a third essential means of implementation that can support synergies: governance.

Governance is fundamental to making synergies a reality since one of the greatest challenges to advancing integrated solutions is working across sectors, scales

and levels (Mulford and Rogers, 1982; Peters, 2002; 2018). This challenge has been recognized for decades; early studies suggested that no reform is more common than “what we need is more co-ordination” (Pressman and Wildavsky, 1984). Similarly, it has been widely understood that governance is critical to facilitating cooperation across potentially divergent interests and helping actors to recognize and exploit possible interdependencies across mandates (Marin and Renate, 1991). Studies have also suggested why and how governance arrangements can break down silos and enable the implementation and coordination of synergistic solutions, vertically (i.e., across different scales and levels of government) and horizontally (i.e., across different policy areas and sectors) - with some taking a more top-down view and others offering a more bottom-up perspective (Kaufmann, Kraay and Zoido, 1999; Hempel, 1996). A third perspective that brings in both top-down and bottom-up perspectives underlines that governance entails the totality of interactions in which government, the private sector and civil society aim to solve problems or create opportunities for change (Jaap, 2013).

The third integrative perspective aligns with a growing interest in applied work on environmental governance, which stresses the importance of crafting sound environmental legal and policy frameworks alongside various forms of stakeholder participation and

engagement to respond to climate, biodiversity and pollution imperatives. It also demonstrates that environmental governance can encompass a broad range of objectives, principles, practices, approaches and institutions that shape how decisions are made and implemented (UNEP, 2010; 2019; 2023). This work has further highlighted that environmental governance thus spans various levels, sectors and normative systems, and is underpinned by the environmental rule of law, with a complementary focus on implementation, compliance and enforcement. This is often achieved through sound environmental laws, access rights, and clear and coordinated mandates and roles within and across institutions (UNEP, 2019; 2023). More coherent implementation of environmental commitments under various multilateral environmental agreements (MEA) is one way that environmental legal, policy and institutional frameworks and processes can enable integrated responses to the triple planetary crisis. Work on environmental governance also highlights greater recognition of legal pluralism and decentralization, and notes the importance of meaningful stakeholder participation in decision-making at various levels (UNEP, 2019; 2023).

Environmental rule of law and its core elements, together with cooperation, collaboration and synergies, are hence fundamental to environmental governance. Further, synergistic solutions (like those featured in Chapters 2–5) and environmental governance are frequently mutually reinforcing. While elements of environmental governance support cross-sectoral, cross-level and cross-institutional synergies, synergistic action in turn strengthens governance systems by enhancing collaboration, cooperation and coherence, and by supporting the consistent implementation of environmental goals and commitments. Understanding the structures and processes that underpin and drive synergistic action on the ground is hence needed to realize the potential benefits of synergies (Zusman and others, 2025).

The role of governance in unlocking this potential varies across contexts and regions. The Asia-Pacific region, with more than 60 per cent of the world's population, represents a diverse set of approaches to governance, ranging from centralized authority structures to more distributed, multi-actor approaches. This diversity offers valuable lessons for policymakers, as countries across the region are already experimenting, both formally and informally, with governance mechanisms designed to address climate change, biodiversity loss and pollution in more integrated ways. For example, several countries have begun institutionalizing cross-sectoral coordination and embedding learning processes into planning cycles for synergies.

Given this diversity and growing experiences, policymakers would benefit from an action-oriented framework that distils how different governance approaches can enable synergies in diverse contexts. Such a framework can support countries in strengthening mandates, improving coordination and designing institutional arrangements

that generate synergistic outcomes. Section 8.2 presents one such framework before illustrating its practical application through case studies from the region (section 8.3).

8.2 Synergistic approaches

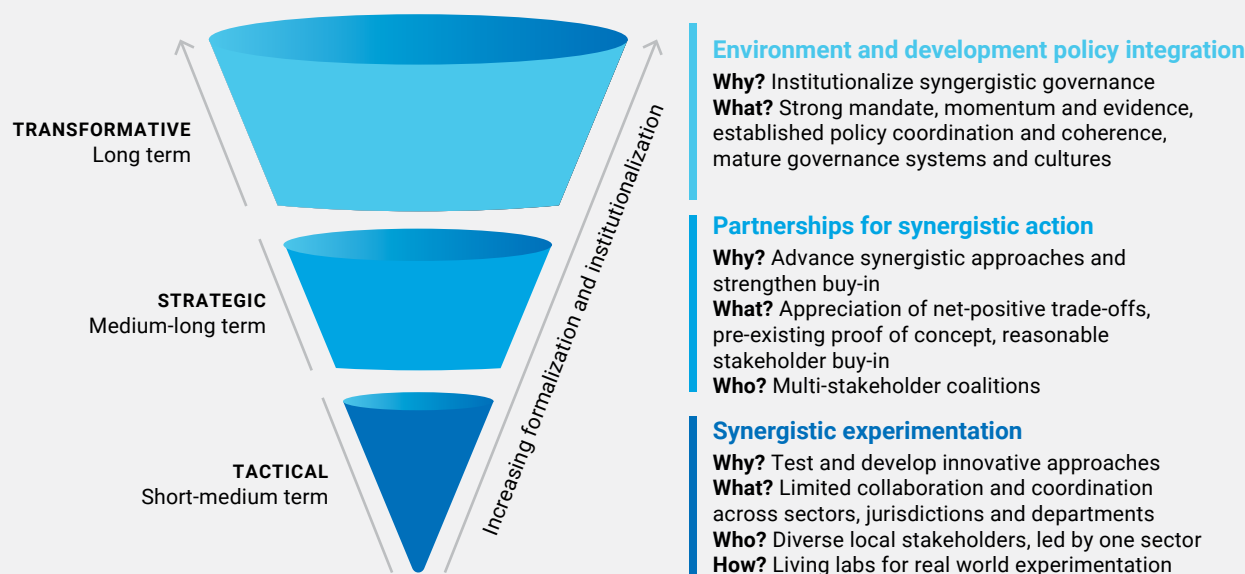
This section presents a multilevel framework that illustrates the different approaches to collaboration and coordination needed to break down siloes and achieve synergies at different levels of institutionalization and impact. As summarized in figure 8.1, the Synergistic Governance Framework consists of three indicative levels of formalization with corresponding progressively wider scale impacts: tactical, strategic and transformative.

The Synergistic Governance Framework consists of three indicative levels of formalization with corresponding progressively wider scale impacts: tactical, strategic and transformative.

Rather than offering a prescriptive and discrete set of categories of synergistic governance, the framework functions as a diagnostic tool for identifying relevant and valuable approaches for governance. These modes of governance work over different time horizons; are led by different actors or institutions; involve different costs, risks and enablers; and are best applied to different use cases (table 8.1 presents a high-level summary of how the framework relates to these areas). In this way, the framework is intended to enable decision makers to understand their current context and inform deliberate strategic planning to advance synergistic governance.

There are two key considerations for interpreting this framework. First, though presented as a hierarchy, the framework should not be read as a linear pathway wherein policymakers automatically ascend to progressively higher levels of institutionalization and impact. In some cases, there may be a broader strategic goal and an intent to move from one level to the next. In other cases, a range of contextual factors, such as limited administrative capacities or the desired scale and duration of an intervention, may influence the actual or desired approach. Second, each case study elaborated below, as part of the framework, may exhibit aspects of more than one mode of synergistic governance (tactical, strategic and transformative). The framework is intended to be broadly illustrative of key processes and structures that fit in representative categories. Applications may borrow or blend experiences from different categories.

Figure 8.1 Synergistic Governance Framework



Source: Adapted by authors based on S. Malekpour, S. Tawfik, and C. Chesterfield, "Designing collaborative governance for nature-based solutions", *Urban Forestry & Urban Greening*, vol. 62, No. 127177 (July 2021).

Table 8.1 Summary of the characteristics of tactical, strategic and transformative modes for governance

Modes	Tactical – synergistic experimentation	Strategic – partnerships for synergistic action	Transformative – environment and development policy integration
Time horizon	Short-medium term immediate problem-solving or pilots for experimentation	Medium-long term; alignment across plans and programmes	Long-term; structural and systemic change
Typical actors/institutions	Line ministries, technical agencies, subnational officials, project teams	Cross-ministerial committees, planning commissions, national or regional coordination bodies	Whole-of-government leadership, heads of state, parliaments, constitutional bodies, empowered regulators
Costs	Low to moderate; primarily administrative adjustments or pilot projects	Moderate; requires coordination budgets, shared data platforms, and joint programmes	High upfront; requires legal reforms, institutional restructuring, long-term financing frameworks
Risks	Fragmentation; lack of continuity; pilots not scaled; limited institutional uptake	Coordination fatigue; unclear authority; uneven implementation across ministries or regions	Rigidity; political resistance; path-dependency; high transaction costs; institutional overload if poorly designed
Enablers	Low-barrier experimentation; flexible budgets; technical training; informal networks; local competitive advantage	Strong mandates; shared indicators; interoperable data; cross-sectoral financing tools	Political commitment; durable legal frameworks; public participation; independent oversight; sustained investment
Ideal use case	Testing ideas; piloting multi-benefit interventions; improving coordination on specific issues; generate early evidence and local learning	Aligning climate, biodiversity, pollution and development plans; harmonizing standards; scaling successful pilots	Embedding synergy in laws, mandates, fiscal systems, national planning cycles, and long-term development models
Examples from the Asia-Pacific region	- Community-based water-energy-food nexus initiatives in Nepal - City-level clean air pilots in Indonesia, the Philippines and Thailand - Local nature-based solutions (NbS) pilots in the Philippines (mangrove restoration)	- Integrated climate-ocean-biodiversity governance in Fiji under its National Adaptation Plan (NAP) - Combined climate-land degradation neutrality strategies in Mongolia - National Clean Air Programme coordinating 131 cities in India	- Constitutional commitment to environmental protection in Nepal "Ecological civilization" and institutional integration in China - Legal personhood for natural ecosystems (e.g. Whanganui River) in New Zealand

The following subsections detail distinctive features and provide real-world examples of the three indicative synergistic governance modes (Malekpour, Tawfik and Chesterfield, 2021) in relation to how they answer four key operational questions:

1. Desirable outcomes of synergistic governance at different levels of formalization (the **'why'**);
2. The context or enabling environment in which different forms of synergistic governance takes place (the **'what'**);
3. The roles and responsibilities of various actors in different synergistic governance modes (the **'who'**);
4. Fit-for-purpose structures and processes constituting synergistic governance at different levels of formalization (the **'how'**).

Mode 1: Synergistic experimentation (tactical governance)

Why is experimentation needed?

Though there has been progress, environmental and sustainable development governance often remain siloed across Asia and the Pacific (Li and Puppim de Oliveira, 2021). Incumbent structures, practices and norms create path dependencies and institutional barriers to change. In this context, tactical modes are needed to test innovative synergistic approaches (Li and Mauerhofer, 2016). When multisystem interactions, impacts and trade-offs are complex and uncertain (Bu and others, 2024), collaboration through experimentation can begin to break down silos, reframe problems and solutions, and reveal multiple options (Sharp and Raven, 2021). Empowering communities through engagement and participation can deepen these processes, surface tensions and potential conflicts, and support trust-building during the early phases of collaboration (Edelenbos and van Meerkerk, 2015; Klijn, Steijn and Edelenbos, 2010). These processes further allow for capacity- and relationship-building to strengthen and create new norms around multi-actor, cross-sectoral, multilevel and regional cooperation.

What is the enabling environment for synergistic experimentation?

Experimentation is an appropriate synergistic governance mode when collaboration and coordination across sectors and organizational levels and departments is not the norm (Sabel and Zeitlin, 2010). In such contexts, there is no pre-existing proof of concept for synergistic action, limited pre-existing buy-in, and rigid structures and processes that hinder more ambitious outcomes (Malekpour, Tawfik and Chesterfield, 2021). At the same time, tactical collaboration through experimentation benefits from other enabling conditions. For instance, individual and collective commitments and skills can be important, including openness to dialogue, ability

to communicate across boundaries, relationships and networking capacity (Hadfield and others, 2024; Kok and others, 2023; Hölscher, Wittmayer and Loorbach, 2018). Flexibility and agility in work cultures, institutional support (such as from partner universities) and the presence of local champions and intermediaries can further support the experimentation that is critical to this tactical mode (Hadfield and others, 2024; Martek and others, 2022; Sharp and Raven, 2021). Alignment with policy priorities and formal agreements can also strengthen the mandate for and legitimacy of experimentation (Raven and others, 2019), and public and private sources of seed funding can facilitate knowledge exchange and ideation, consortium development and feasibility studies (Hadfield and others, 2024).

Who is involved in synergistic experimentation?

Tactical governance is typically localized and potentially led by one sector, while seeking to engage a diverse range of stakeholders. Innovation-driven collaboration involves leaders willing to experiment (Malekpour, Tawfik and Chesterfield, 2021) and intermediaries or "boundary spanners" able to broker knowledge, discourse and actor interests between sectors, jurisdictions and actor networks (Ziervogel, 2019). Hence, this approach provides an opportunity for bottom-up community engagement and participation, recognizing the value of different forms of (local) knowledge in understanding and responding to intersecting challenges (Hadfield and others, 2024).

How is synergistic experimentation operationalized?

At the tactical level, collaboration builds on informal connections and engagements through coordinated forums for knowledge-sharing, capacity-building, testing and learning in the short- to medium-term (Malekpour, Tawfik and Chesterfield, 2021). Living labs, for example, provide a coordinated platform for real world experimentation that are typically localized or place-based so that learning is embedded in the sociomaterial context (Hossain, Leminen and Westerlund, 2019). Living labs facilitate co-production of knowledge by involving diverse stakeholders and end-users in problem definition, visioning and co-design of sociotechnical solutions (Vicini, Bellini and Sanna, 2012). Living labs generate evidence by testing and trialling concrete interventions through a learning-by-doing approach that is open to failure (Lehmann, 2018; Yan and Roggema, 2019; see also Chapter 4 on a living lab in Sado, Japan). Ongoing reflexive monitoring and evaluation enables iteration and social learning among participants and broader communities of practice through knowledge-sharing (Van Mierlo and others, 2010; Wardani and others, 2024; Williams and Robinson, 2020).

Examples of programmes fostering environmental stewardship by local communities in New Zealand, Nepal and Japan (discussed in Chapter 3) provide

illustrations of tactical modes that shift environmental management norms and recognize diverse knowledges and Indigenous relational values (in the New Zealand case) in new ways. These participatory approaches enhance synergies for biodiversity, emissions reduction, food systems, livelihoods and culture.

Mode 2: Partnerships for synergistic action (strategic governance)

Why are partnerships needed?

Strategic partnerships are needed to strengthen buy-in across sectors and jurisdictions and facilitate implementation of synergistic approaches (Fast and Widerberg, 2025; Glass, Newig and Ruf, 2023; Koloffon Rosas, 2025; Wanner and Miljand, 2025). Sustainable development challenges typically do not align with jurisdictional boundaries and their complexity requires application of diverse sets of knowledge, skills and resources. Multi-stakeholder partnerships work to bridge silos, mobilize diverse capabilities, and promote coordination and inclusion to shift norms, regulations and/or behaviour for sustainable development (Glass, Newig and Ruf, 2023; Wanner and Miljand, 2025). For example, multi-stakeholder partnerships often serve to connect climate change, biodiversity, health and education goals (Widerberg and others, 2023). “Small wins” achieved through formal partnerships can build and sustain momentum for stronger collaboration and coordination (Ansell and Gash, 2008).

What is the enabling environment for synergistic partnerships?

International climate and development agendas recognize the role of diverse actors in environmental governance, including cities, which legitimizes multi-stakeholder partnerships (Glass, 2023; Wanner and Miljand, 2025). Synergistic partnerships are further enabled by an appreciation of net-positive trade-offs among key actors, pre-existing proofs of concept (such as successful demonstration projects) and reasonable buy-in among key stakeholders (Malekpour, Tawfik and Chesterfield, 2021). Moreover, partnerships can align with established goals in domestic policy and scientific recommendations or develop priorities through deliberative processes and collective visioning or low-cost rapid assessment (Horan, 2022). Capacity-building and professional orchestrators can enable effective partnerships by mitigating unequal engagement (Horan, 2022).

Who is involved in partnerships for synergistic action?

Strategic partnerships for synergistic action involve voluntary cross-sectoral and cross-jurisdiction agreements (Wanner and Miljand, 2025). Non-state actors are increasingly involved in multi-stakeholder partnerships, including non-governmental organizations (NGOs) engaged in implementation; research and

academic institutions providing expertise; and business actors providing funding (Glass, Newig and Ruf, 2023). Intergovernmental organizations and governments as lead partners can contribute to the success of partnerships by providing resources and personnel as well as credibility and legitimacy, supported by clear commitments (Glass, Newig and Ruf, 2023). Government participation and advocacy coalitions are needed for partnerships to influence decision makers and contribute to policy change for wider impact (Wanner and Miljand, 2025). Distributed leadership can bolster the influence of the collaboration on participating organizations (Barrutia and Echebarria, 2019).

How are partnerships for synergistic action operationalized?

The partnership level of collaboration represents a more formalized, though still temporary governance structure, characterized by an agreed and specified purpose, formal strategies and actions, and resource commitments over the medium- to long-term (Malekpour, Tawfik and Chesterfield, 2021). As organizing structures, partnerships have a variety of forms and signifiers, including “alliances, coalitions, collaborations, cooperative initiatives, cross- and intra-sectoral partnerships, networks, and multi-stakeholder platforms” (Wanner and Miljand, 2025, p. 2). Institutional mechanisms such as interdepartmental teams and committees, as well as engagement processes involving actors at different jurisdictional and sectoral levels provide practical examples of partnerships that are capable of advancing synergistic approaches (Allen, Malekpour and Mintrom, 2023). Partnerships require clear incentives to participate and commitment of resources can strengthen ownership of the collaboration (Ansell and Gash, 2008). Stakeholder mapping and databases can support partner identification (Horan, 2022). To advance synergistic action, partnerships can explicitly target leverage points for system change, such as system parameters, feedback loops, design and areas of intentional action (Koloffon Rosas, 2025). While partnerships are more formalized than tactical modes, they also allow for flexibility needed for the adaptation of goals, activities and metrics to new conditions or information (Rijke and others, 2013). Regular communication and monitoring of partnerships can also improve the effectiveness of partnerships (Glass, Newig and Ruf, 2023).

Partnership modes are also highlighted in other chapters in the report. For instance, partnerships operate along science-policy interfaces (Chapter 2, 3, 4), public-private joint efforts (Chapter 5, 6, 7) and cross-boundary collaborations (Chapter 2, 3, 5, 7). They can also be useful for resource mobilization. To illustrate, Chapter 6 provides an example of multi-donor coordination. The Just Energy Transition Partnership in Viet Nam brings together government bodies, international development agencies and private financial institutions to mobilize public and private finance for coal phase-out and reskill workers for green jobs.

Moreover, as discussed in Chapter 3, several regional platforms exist to promote synergistic solutions across government policies in the Asia-Pacific region by sharing knowledge, guidance and data; convening stakeholders across sectors; coordinating capacity-building initiatives and pilot programmes; and providing funding and finance. These initiatives also support policy and practice alignment across borders, including to reflect ecosystem rather than jurisdictional boundaries, and strengthen market signals and investor confidence regionally.

Similarly, regional and global city networks (highlighted in Chapter 5) can serve as semi-formalized yet still flexible partnerships by enabling peer learning, scaling of successful urban initiatives and access to finance for synergistic action from municipal authorities. In addition, cross-level and horizontal cooperation within levels of government and among cities and regions, respectively, can be facilitated through urban forums, planning bodies, councils and task forces operating at metropolitan, cross-city and national levels.

Mode 3: Environmental and development policy integration (transformative governance)

Why is integration needed?

While partnerships can help facilitate cooperation, continually achieving synergies may require more formal coordination mechanisms and incentives for repeated interactions (Peters, 2018; 2002). Institutionalizing integration and sharing good practices are particularly important because institutions can easily backslide into familiar siloes. Creating more formal collaboration and institutional mechanisms can raise expectations that synergies, not silos, are the new norm. Generating incentives that support that new norm can also create the kinds of virtuous feedback loops that bring in more sectors, stakeholders and scales as part of a broadening of synergies (Zusman and others, 2025).

What is the enabling environment for integration?

Integration is typically most appropriate when there is already some experience with the other synergistic modes of governance. These experiences clarify stakeholder interests and how different institutional arrangements can support their alignment over time (Amanuma and others, 2018). Critical enabling conditions include strong top-down directives, complemented by bottom-up demand (Persson and Runhaar, 2018), including political will, leadership, champions and coalitions, and alignment with priorities of political parties (Dzebo, Shawoo and Browne, 2025). Integration is also enabled by evidence and understanding of synergies, costs and benefits across jurisdictions and sectors (Hidalgo, Nunn and Beazley, 2021). Established coordination of information, roles and actions contributes to increased policy coherence, which, in turn, provides the foundation for

structural policy integration (Dzebo, Shawoo and Browne, 2025). Integration thus relies on mature governance systems and cultures, including incentive structures that prioritize aligning short-term with long-term benefits and embracing complexity (Dzebo, Shawoo and Browne, 2025; Hidalgo, Nunn and Beazley, 2021).

Who is involved in integration?

Integration involves a range of stakeholders and is often led by national governments, with a strong emphasis on coordination across well-established administrative remits and structures. It may also be guided by government officials who leverage their positioning and steering capacities to strengthen coordination mechanisms. Integration may also be facilitated through existing agencies or by creating new ones (such as sustainability offices) tasked with leading integration efforts. It may further expand to engage subnational governments, or the private sector and civil society actors, as part of a broader push to formalize a whole-of-society approach.

How is synergistic integration operationalized?

This level represents the strongest form of interagency collaboration and coordination. Ongoing formal structures such as institutional mechanisms set by policy and legal frameworks are established to embed cross-cutting issues and mandate priorities horizontally and vertically across departments and levels of government, sectors and scales over the long-term (Allen, Malekpour and Mintrom, 2023; Dzebo, Shawoo and Browne, 2025; Malekpour, Tawfik and Chesterfield, 2021). These structures often consist of representatives from relevant agencies working together to consider areas of overlap across related policy areas (Zusman and others, 2025). Policy integration involves a systematic and dynamic approach to identifying, managing, and monitoring and evaluating synergies and trade-offs through a combination of policy instruments and institutional mechanisms (Dzebo, Shawoo and Browne, 2025; Lazaro and others, 2022). Participatory decision-making processes ensure that diverse perspectives are formally reflected in the criteria and values underpinning policy integration and allocation of resources, while transparency and communication, such as acknowledgement of short-term trade-offs, foster public trust and legitimacy in institutions (Dzebo, Shawoo and Browne, 2025). There may also be opportunities to create incentives for integration such as by promoting agency leaders that demonstrate capacities to work across agendas or by allocating resources based on their synergistic impacts (Cai, Zusman and Meng, 2023).

The diversity of the Asia-Pacific region means there is no one-size-fits-all approach to institutionalizing synergies in this mode; what works well in one context may not be effective in another. Nevertheless, a wide range of good practices within the region and beyond illustrate different

ways of embedding governance at varying degrees of integration and formalization. Chapter 6 discusses climate budget tagging established in Indonesia, the Philippines, and emerging in Thailand and Viet Nam, representing a concrete approach to institutionalizing synergistic governance by integrating climate in national expenditure decisions and monitoring. Chapter 2 makes several recommendations for systematic integration of health in climate policy and governance to institutionalize synergies. Some countries already reference health in their Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs) or Long-Term Low Emission Development Strategies (LT-LEDS). This chapter further highlights the need for horizontal integration and coordination through ministerial co-leadership across climate and health, alongside energy, agriculture and urban ministries, and joint implementation plans.

8.3 Case studies

Building on the diverse examples of different modes of governance described in section 8.2, this section provides practical insights into how synergistic outcomes are realized on the ground. Cases were selected and analysed through a governance lens, focusing on the institutional arrangements and mechanisms that facilitate the dynamic interactions needed for the uptake of synergistic solutions. To provide a structured overview, each case is categorized into one of three dimensions corresponding with the three modes outlined in section 8.2: tactical, strategic or transformative, and are summarized in table 8.2. This classification illustrates how diverse governance approaches can be tailored to support the adoption and implementation of synergistic solutions.

Table 8.2 Summary of the case studies

Areas of synergies	Synergistic solutions/approaches	Key actors	Enablers
Case study: Solarization of schools in Quezon, the Philippines SDGs:    			
• Solar power • Climate resilience • Energy security • Environmental education	• Installing solar PV panels on schools to reduce energy costs and increase resilience • Using pilot schools to demonstrate tangible “small wins” before scaling	• Quezon City Government • The city mayor • International networks (C40) • Local school stakeholders	• Strong mayoral leadership • A dedicated Climate Change Department • Integration into the local climate action plan and international technical collaboration
Case study: The Secretariat of the Pacific Regional Environment Programme SDGs:    			
• Climate adaptation • Biodiversity conservation • Waste management • Cultural integrity	• A strategic governance framework that links national datasets via the Pacific Environment Data Portal and applies environmental impact assessments (EIA) across all thematic programmes	• SPREP Secretariat • 26 member nations/territories • Regional technical partners • And international donors	• Long-standing institutional structures that balance formality with flexibility • Regional consensus-building platforms • And centralized technical/scientific support
Case study: The co-control strategy in China SDGs:    			
• Air quality improvement • Climate mitigation • Technological innovation • National economic competitiveness	• An iterative “co-control” approach that shares responsibilities between energy (NDRC) and environment (MEE) ministries • Embedding numerical targets into five-year plans	• National and provincial governments, state enterprises • Research institutes, and universities	• High-level political commitment (Carbon Neutrality 2060) • Institutionalized inter-agency coordination • Authoritative real-time monitoring data and a government responsibility system
Case study: Integrated framework for carbon neutrality in Hong Kong, China SDGs:    			
• Clean air • Net-zero electricity • Biodiversity conservation • Sustainable lifestyles	• Integrating global climate goals with local liveability through the “Clean Air Plan” and “Climate Action Plan 2050” • Rebranding recycling via the “GREEN@COMMUNITY” network	• Chief executive • Environmental Protection Department • Utility companies • And civil society (Council for Sustainable Development)	• Leadership-led steering committees • Technical regulatory expertise • Public-private partnerships for energy transition • And community-level incentive schemes

Solarization of schools in Quezon, the Philippines (experimental mode with elements of strategic governance)

Quezon, a city of 3 million people in the Philippines, is known for its socially progressive approach to health, education and environmental issues. The city government is increasingly aware of the possible connections between education and the environment, partly due to its exposure to climate risks and hazards. In response, it has worked on climate projects that cut across sectors, scales and stakeholders.

A project in Quezon involving installing solar photovoltaic panels in schools illustrates an experimental approach to governance. The project, which reduces energy costs while enhancing resilience, resulted from several factors that are consistent with experimental governance, with potential for greater impact.

The city established the Climate Change and Environmental Sustainability Department to support these interactions and advance a “city-wide and society-wide approach to climate action”. As part of this mandate, the department hired staff that focused on climate mitigation, adaptation and environmental education, helping to steer the project’s development and facilitate engagement across divisions and affected stakeholders.

These structures were further supported by planning processes that helped the project gain support. Many of these processes fed into *Quezon’s Enhanced Local Climate Change Action Plan* and are linked to an ambitious target of 30 per cent reduction in greenhouse gases (GHGs) from schools by 2030. The government’s initial investment in pilot schools demonstrates the tangible benefits and generates a set of small visible wins. These demonstrations have raised awareness about the benefits of the project and provided a foundation for scaling solar in other schools and buildings.

Finally, the city has benefited from leadership and cooperation with international partners. In terms of leadership, the city’s mayor has been a strong advocate for positioning the city as a climate front-runner over her three terms in office. In terms of international collaboration, the city has cooperated closely with networks such as C40 on the solarization project specifically and multisector climate planning generally.

As a result of this experimental approach to governance, the city has made steady progress in installing solar panels in schools and has now moved beyond its initial pilot to invest in additional schools. This progress is partly attributable to the institutional structures and planning processes described above, in addition to local leadership and international collaboration that have raised the profile of this work. Finally, recognition at the national level that solarizing schools can reduce costs and build resilience has provided additional support.

Beyond illustrating the potential for tactical (experimental) governance, the case also suggests that project planning is often embedded in higher-level city and national governance structures and processes. These can be mutually reinforcing and serve as a force for progressively wider scale impacts such as helping to advance other multisector climate projects in Quezon or spreading solarizing schools to other parts of the Philippines. Finally, while work on governance tends to focus on institutions and processes, there are also intangible elements such as leadership or international support that can help advance experiments and innovative cross-cutting solutions.

The Secretariat of the Pacific Regional Environment Programme (SPREP) (strategic mode)

The Pacific Island region sits at the frontlines of climate change, facing direct threats from sea level rise and extreme weather events that severely degrade biodiversity and resource systems. This degradation not only imperils livelihoods but also undermines the cultural integrity of communities that depend on these resources. Such challenges cross jurisdictional boundaries and connect multiple spheres of decision-making, necessitating partnerships and strategic forms of governance that can help fill capacity gaps and enable the implementation of synergistic solutions.

Pacific Island governments have taken a strategic governance approach through partnerships for synergistic action in response to these challenges at a regional scale. The Secretariat of the Pacific Regional Environment Programme (SPREP) is a regional organization established by governments in the Pacific Islands “to promote cooperation in the Pacific region and provide assistance in order to protect and improve its environment and to ensure sustainable development for present and future generations” (SPREP, 2026). It consists of 26 members, including 21 Pacific Islands countries and territories, and 5 metropolitan States with a direct interest in the region. SPREP also works with relevant donor countries as well as international funding organizations such as the Green Climate Fund.

The Secretariat of the SPREP, based in Apia, Samoa, helps members to work across not only national borders but sectoral boundaries, and provides support based on common interests. Overall guidance and direction are offered by a governing council that meets biannually to set the budget and agree on the work programme. SPREP also collaborates with a wide variety of actors outside of its immediate membership and secretariat. Key external partnerships include the Pacific Islands Forum, the Pacific Community and the University of the South Pacific that, for example, provide and link scientific data and technical assistance. Based on such partnerships, the Pacific Environment Data Portal is one of the operational mechanisms that ensures member

buy-in and accountability. The portal acts as a regional hub that connects national datasets, facilitates data-sharing and strengthens data governance. Furthermore, SPREP has developed and implemented the “Country and Territory Strategic Partnership Framework”, which allows members to directly monitor project implementation. Complementing these mechanisms, the Environmental Impact Assessment (EIA) serves as a critical cross-cutting safeguard within SPREP’s governance architecture. By applying EIA across all thematic programmes, from climate adaptation to waste management, SPREP ensures that development interventions mitigate environmental risks while also addressing social dimensions, thereby protecting the cultural integrity and livelihoods of local communities.

SPREP provides crucial regional leadership and technical guidance and helps members to implement multiple global MEAs and key regional frameworks.

SPREP provides crucial regional leadership and technical guidance and helps members to implement multiple global MEAs and key regional frameworks. As the main regional environmental organization in the Pacific Islands, SPREP provides a trusted and established platform for consensus-building, knowledge-sharing and collective action among members and international donors on a range of interrelated environmental issues. For instance, SPREP assists countries in integrating responses to international policymaking processes during global negotiations, such as Conference of the Parties (COPs) and the United Nations Environment Assembly (UNEA). SPREP also serves as a regional platform for resource-constrained national delegations by coordinating strategic planning and providing technical support on draft text to ensure interests are understood. It further supports project implementation by, for instance, supporting ecosystem-based adaptation projects to simultaneously tackle climate change and biodiversity loss.

Regional collaboration platforms like SPREP illustrate how partnerships that balance formality and flexibility can bring together countries and supportive entities to address a shared set of environmental concerns and ultimately enable synergistic action. SPREP’s relatively long history has ensured that it has established processes and structures with a relatively high degree of formality, while ensuring sufficient flexibility for countries to determine how they would like to collaborate within the partnership. However, challenges remain in aligning donor funding with this integrated approach. While SPREP promotes cross-cutting governance, external funding streams often remain siloed, creating a potential barrier to fully integrated regional programming and implementation.

The co-control strategy in China (transformative mode)

Over the past two decades, China has adopted increasingly ambitious responses to the twin challenges of climate change and air pollution. These challenges often stem from similar causes and benefit from solutions recognizing those connections. Initially labelled as the co-control of air pollution and climate change in China, and more recently evolved into a focus on synergies, this effort has sought to leverage and expand this win-win potential. The expansion is evident in the growing emphasis on the more aspirational and transformative goals of an ecological civilization and harmonious coexistence between humanity and nature (China, 2024).

China illustrates an iterative, multidimensional process towards synergistic solutions for co-controlling air pollution and carbon emissions. This transformative mode is partially a result of institutional arrangements that shared the climate portfolio between the National Development and Reform Commission (NDRC), which was charged with energy planning and the Ministry of Environment and Ecology (MEE), which was charged with protecting the environment. Sharing institutional responsibilities has been part of an ongoing effort to optimize resources and maximize impacts. Importantly, responsibilities for working on synergies have spread to other line agencies that could contribute to joint goals such as the Ministry of Transport and Agriculture. Mechanisms that have facilitated structured dialogues and consensus-building across relevant agencies have helped to set shared goals, allocate resources and delegate responsibilities to lower-level governments. These structures have been complemented by the country’s five-year plans and related climate, air pollution and other sectoral targets. Having numerical targets that can help identify areas of overlap and divergence, and assess progress toward shared objectives has also helped strengthen cooperation.

In addition, efforts to institutionalize cross-divisional coordination have also been integrated into provincial and subnational government planning processes. For example, Zhejiang province has been particularly proactive in operationalizing co-control in environmental plans. The approach has also spread across different sectors, leading to the creation of innovation ecosystems comprising the government, enterprises, universities and research institutes that are engaged in areas ranging from smart grids to renewable energy.

The work of China on synergies has been reinforced by other enabling reforms. Most notably, deploying real-time air quality monitoring systems and building emissions inventories has helped strengthen multisectoral, multi-stakeholder governance. Evidence-based data streams have helped make pollution visible and measurable, while also generating incentives for working across sectors to address it. These incentives have, in turn, motivated policymakers to identify solutions that address not only

air pollution and climate change, but also opportunities to capture additional benefits. Such benefits include strengthening economic competitiveness, technological innovation and national prestige. The search for wider benefits has also been complemented by social media and public pressure to improve air quality and create more sustainable futures. The government responsibility system, which uses data-driven criteria as a basis for evaluating performance and determining future promotional prospects, has helped to institutionalize the consistent pursuit of synergies.

These multiple factors have come together to strengthen synergies, partly due to leadership support for cross-agenda coordination to achieve ambitious climate and air quality goals. This support was exemplified by President Xi Jinping's 2020 commitment to having carbon emissions peak before 2030 and achieving carbon neutrality by 2060 (China, 2024), as well as recent pledges in 2025 to reduce emissions from 2035.

The results of such efforts have been notable. The country has continually achieved climate and air pollution targets set out in relevant five-year and sectoral plans. It has benefited from a growing ecosystem supporting changes to energy systems. While these efforts

have been government-led, for instance, with sizable investments in research, development and deployment of renewable energy technologies across the power, heating and transport sectors, they have also expanded to the private sector (China, 2024).

The work on co-control in China illustrates the critical role of institutionalizing coordination across agencies with shared interests. It also underlines that this coordination may start horizontally but expand vertically. It further suggests that cross-sectoral and multiscale efforts can induce virtuous cycles of change that help address a growing range of interrelated environmental and development challenges. For example, China is contemplating incorporating gross ecosystem product, the total value of final ecosystem goods and services supplied to human well-being in each region, as part of a nature-social-economic accounting system to assess local environmental performance.

A final point merits attention: this transformative approach is not only visible at the national level. The integrated approach of Hong Kong, China to climate neutrality is an illustration of transformative governance that has worked across sectors and stakeholders (Box 8.1).

Box 8.1 Integrated framework for carbon neutrality in Hong Kong, China

Hong Kong, China has sought to integrate solutions to global climate change and local challenges in recent years. An example of these efforts is the co-control of air pollution and carbon emissions. Co-control was strategically introduced by local authorities, including the Secretary for the Environment under the Clean Air Plan for Hong Kong, China in March 2013.^a Over the next decade, that idea gained support in other high-level policy documents such as the Climate Action Plan 2050 (2021) that set a carbon neutrality target before 2050 as well as a long-term vision of "Healthy Living - Low-carbon Transformation - World Class". This latter vision moved beyond integrating air quality and climate to sound resource management, biodiversity conservation, and climate adaptation and resilience in a synergistic manner.

Efforts to achieve this synergistic vision have been supported by leadership and governance processes that facilitated collaboration across a network of actors. Leadership played a critical role in this regard because many of the efforts to work across this network were initiated by local authorities, including the Secretary for the Environment, who spearheaded the implementation of clean air, energy efficiency and biodiversity policies.

Importantly, the pursuit of synergies by Hong Kong, China has involved working with the private sector and civil society. For example, utility companies like China Light and Power and Hong Kong Electric have helped to advance a strategic energy transition towards net-zero electricity generation with links to safety, reliability, affordability and environmental performance. At the same time, academics and the public under the Council for Sustainable Development worked to solicit input and feedback into related Long-term Decarbonization Strategy (2019) and Single-use Plastics Controls (2021). Other project-level multisector interventions included collaborations with designers and community groups to rebrand and expand community recycling network, such as GREEN@COMMUNITY, featuring the "6" icon and incentive schemes coined "GREEN\$" to encourage recycling and low-carbon lifestyles.

^a Environment Bureau and others, "A clean air plan for Hong Kong", March, 2013. Available at https://www.eeb.gov.hk/sites/default/files/New_Air_Plan_en.pdf

8.4 Enablers for scaling and replication

This chapter has outlined a multilevel framework for breaking down siloes and facilitating the dynamic interactions needed for integrated solutions to address the triple planetary crisis. As a diagnostic tool, the framework is intended to help policymakers and other relevant stakeholders plan for progressively wider scale impacts. To some degree, by outlining three distinct modes for targeting broader impacts, the framework offers multiple pathways for scaling. That is, policymakers and other stakeholders may start with tactical modes and then aim for strategic and eventually transformative modes.

At the same time, the governance modes outlined in the framework influence and are influenced by other factors that can determine the depth, breadth and scale of impacts. Indeed, governance enables connections between finance, data and tools, and is thus influenced other means of implementation. For example, institutional coordination mechanisms can determine whether and how much funding moves from financing ministries to environmental ministries. At the same time, other means of implementation can affect the outcomes achieved by synergistic governance. To illustrate, the interoperability of data systems and planning tools can enable more coherent planning and policymaking. Financing structures such as cross-ministerial budgeting and results-based financing can also create incentives for cross-sectoral coordination.

The synergies between different enablers are therefore critical to scaling. Governance without support from other enablers is likely to generate incremental rather than transformational changes. In fact, making the most of synergies requires not only due attention to how governance enables solutions, but how connections between finance, data and tools, and governance interact to achieve their own synergies.

Governance not only interacts with other means of implementation but is critical for making progress along the four main solution pathways discussed in Chapters 2–5. For example, as argued in Chapter 2, health is a powerful political driver for climate action; however, cross-ministerial collaboration is often needed to align environmental and health agencies behind these health-centred climate actions. Governance mechanisms that support decentralization and bottom-up approaches also help enable progress along key solutions pathways. To illustrate, Chapter 5 underlines that a clear mandate for subnational action is critical to the successful implementation of integrated national biodiversity frameworks. Clearly identifying how budgets contribute to climate change can encourage the pursuit of synergies at the local level.

8.5 Key insights and recommended actions

To fully realize the potential of synergies across the Asia-Pacific region, governance mechanisms must be designed to motivate different actors to break down silos. Governance does not operate in a vacuum; achieving transformational rather than incremental change requires intentional coordination between governance mechanisms and other means of implementation, including finance, data and tools. By embedding synergies into daily practices, legal frameworks and long-term planning, policymakers and stakeholders can contribute to a reinforcing cycle of reform towards a more sustainable future.

This section provides recommendations for diverse stakeholders to operationalize synergistic modes of governance. Following other sections, the recommendations are targeted toward four audiences: national governments, local governments, development partners and regional institutions. However, the key to unlocking the full potential of governance for synergies is to strengthen coordination and cooperation across these actors.

Recommendations for national governments

- Tailor the mode of governance to the scale of the integration challenge and the existing administrative capacity.
 - » **Tactical mode:** Create opportunities for experimental pilots to gather evidence and build stakeholder trust for small-scale initiatives led by a single department, which is highly applicable for local governments.
 - » **Strategic mode:** Establish formal partnerships to address complex issues affecting multiple agencies and large populations.
 - » **Transformative mode:** Institutionalize cooperation through robust legal structures and policy frameworks that embed synergies into the national agenda.
- Connect interventions iteratively within and across all levels. Ensure that regardless of the entry point, experimentation should inform strategy and vice versa, recognizing that pathways are not linear, but often iterative.
- Foster a culture of social learning. Utilize participatory decision-making and inclusive platforms (e.g. living labs), to surface local knowledge and mitigate trade-offs during the early stages of policy design.
- Align incentive mechanisms. Integrate synergistic performance targets into the evaluation criteria for local leaders and government agencies to motivate cross-sectoral action.

- Strengthen horizontal and vertical integration mechanisms. Ensure cross-cutting issues are managed coherently across different levels of government.
- Promote institutional capacity-building to strengthen synergistic governance and avoid fragmented funding streams.

Recommendations for local governments

- Start with tactical modes of governance. Begin with experimental initiatives that bring together a small group of stakeholders across a manageable set of related issues.
- Seek support from higher levels of governments for scaling. Once a synergistic initiative is successful, request resources and political support from national governments and regional organizations to make it scalable.

Recommendations for development partners

- Integrate governance indicators into project evaluation and financing. Implement results-based finance that utilizes indicators for synergies to assess progress on institutional reforms.

Recommendations for regional cooperation

- Establish regional knowledge-sharing platforms on governance. Dedicate these platforms to disseminating best practices and lessons learned, and to facilitating peer-to-peer learning for replicating and scaling successful governance models within and across borders.
- Leverage existing regional bodies for collective action. Use these bodies to strengthen governance for transboundary responses to environmental challenges, shifting away from siloed and sectoral work programmes.

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Conclusion and future outlook



9.1 The Asia-Pacific region: current status and way forward

The Asia-Pacific region stands at a historic crossroads. Rapid economic growth and urbanization over recent decades have delivered major social gains, including higher living standards, reduced poverty and expanded access to education. Yet the resource-intensive, linear production and consumption model that has underpinned this growth is now confronting clear limits. The triple planetary crisis of climate change, biodiversity loss and escalating pollution is intensifying in an interconnected manner, threatening human health, economic performance, social stability and ultimately the range of choices available to future generations.

Facing these compounded crises, simply stacking siloed policy responses tends to normalize a situation in which actions are nominally being taken, yet tangible progress remains elusive. Strengthening climate action in isolation can increase pressure on ecosystems as well as on land and water resources. Pursuing biodiversity conservation on its own can generate tensions with local livelihoods and adaptation measures. If pollution control is skewed toward end-of-pipe solutions, patterns of resource use and emissions can become locked in, allowing problems to re-emerge in different forms. If urban risk reduction is pursued primarily through infrastructure, it can amplify upstream and downstream environmental impacts and widen inequalities. These ‘unintended consequences’ arise not only because policies and institutions are insufficient, but because policies and institutions themselves are fragmented.

The main message of this report is clear: compounded crises cannot be contained through responses confined within single policy domains. What is needed now is to mainstream synergies not as a one-off *ad hoc* coordinated response or isolated success stories, but as the standard approach to policy design and delivery. When planning changes, investment shifts, implementation accelerates and multi-benefit results are made visible so that learning can build on itself in an iterative fashion. This virtuous cycle, once established, can amplify outcomes even under resource constraints, strengthen social acceptance and improve implementation, and accelerate the transformations needed to make progress on the Sustainable Development Goals (SDGs).

To translate this shift into concrete tangible action, clarifying interlinked and synergistic transformation pathways that respond directly to the triple planetary crisis is a critical step forward. The following four pathways provide practical entry points for accelerating progress across multiple SDGs:

- 1. Health-centred climate action** emerges as a powerful driver of ambition and equity. Framing climate action through health and well-being makes abstract targets tangible, linking long-term mitigation and adaptation to immediate, locally-felt benefits such as cleaner air and more resilient food systems. Concrete implementation of this pathway, such as sustainable cooling initiatives in India and agrivoltaics systems in the Philippines, are analysed in detail in Chapter 2, section 3.
- 2. Nature-positive nexus approaches** to development provide a pathway to manage trade-offs across food, water, climate and health objectives. By integrating ecosystem integrity into broader economic and social decision-making, nature-positive pathways align biodiversity conservation with climate resilience and food security. Practical models for this synergistic approach, including the Sado Living Lab in Japan and the Satoyama Initiative in India, are explored in Chapter 3, section 3.
- 3. Circular economy approaches** across core provisioning systems for food, housing, mobility and energy address pollution at its source. Pollution is not an isolated problem, but a systemic outcome of how these systems are designed. Circular strategies that prioritize prevention and material efficiency deliver combined benefits for mitigation, health and sustainable economic development that are greater than the sum of individual efforts. The bio-circular-green rice value chain in Thailand (see Chapter 4, case 1) demonstrate the scalability of these synergistic solutions.
- 4. Cities** are not only at the frontline of interconnected crises but critical delivery platforms for synergies. Integrated urban planning translates national ambition into local impact by aligning land use, transport and waste management. As hotspots where emissions and resource-use concentrate, cities like Jakarta (air quality management) and Quezon City (school solarization) in the Philippines can help break the ground on pioneering approaches to delivering simultaneous gains (see Chapter 5, case 1 and Chapter 8, case 1).

However, identifying cross-cutting action areas alone can leave efforts as a collection of individual projects. To mainstream these priorities at scale and speed, the enabling environment, including finance, data, governance and regional cooperation, must be reconfigured in parallel, so that a virtuous cycle of planning-investment-delivery-visibility-learning can keep turning and generate its own momentum.

The following section therefore sets out six strategic directions that should be prioritized over the coming years in Asia and the Pacific and beyond. As demonstrated in the Annex, these six directions are consistent with the recommended actions that concluded Chapters 2–8. In reviewing these directions, it merits highlighting that just like synergies themselves, they are meant to be part of a package of reforms that generate results greater than the sum of their parts by supporting sustaining a cycle of learning and adaptation, grounded in inclusion and equity.

9.2 Six strategic directions that will shape the future

Strategic direction 1: Make synergies the organizing principle for national development strategies, climate action, biodiversity planning, pollution control and urban policy.

Synergistic approaches should be explicitly positioned as a core organizing principle for development planning, reframing policy objectives from achieving single targets to delivering multiple objectives simultaneously. This is not about arranging separate projects and plans so they do not contradict each other. It requires integrating climate, nature, pollution, health, cities, industry and social inclusion into a single transformation story built on interlinkages, which involves combining policy instruments, avoiding burden-shifting and designing pathways that generate mutually reinforcing outcomes.

A practical way to embed this shift is to institutionalize mechanisms that screen major public investments, industrial policies and infrastructure plans for multi-domain impacts in advance, thereby minimizing trade-offs while enabling simultaneous gains. Such screening is already being operationalized through mechanisms like the climate budget tagging systems in Indonesia, the Philippines and Bangladesh (see Chapter 6, section 2), and the application of environmental impact assessments (EIA) across all regional programmes by the Secretariat of the Pacific Regional Environment Programme in the Pacific (SPREP) (see Chapter 8, case 2). Rather than appraising policies and investments so that they are narrowly trained on achieving a single goal, decision makers should look at optimizing resources to maximize multiple benefits, minimizing spillovers across objectives and evening distributional effects. Once such screening and appraisal become standard practice, cross-cutting collaboration can move from reliance on individual effort to institutional routines, raising both the quality and speed of implementation.

This kind of design will require strong political ownership, including at the highest levels of government, and shared goals and common indicators for line ministries. The choice is whether to continue to place one sectoral project on top of another based on a siloed logic, or to design for system-wide outcomes based on interdependence. If the latter is chosen, alignment will need to go beyond planning documents to connect budgets, regulation, evaluation and data systems.

Strategic direction 2: Empower cities and subnational governments to serve as delivery platforms for synergistic solutions, supported by predictable finance and technical capacity.

Cities are not only a key entry point for demonstrating pioneering approaches to synergies but implementation platforms that can concentrate finance, talent and data to deliver concrete and scalable synergistic action on the ground. When implementation succeeds at the urban level, the value of simultaneous gains becomes even more tangible for other cities, providing the evidence and political support needed to invest in other synergistic actions and spread success to other locations. This potential is demonstrated by integrated air quality management in Jakarta (see Chapter 5, case 1) and the varied multi-objective initiatives in Hong Kong, China (see Box 8.1), which serve as concrete models for inspiring others to invest and implement in urban-led synergies.

Moreover, featuring cities as not just an entry point but an implementation platform can help support the previously mentioned virtuous cycle of reform. More concretely, the more that integrated initiatives are implemented in cities and the more their outcomes are made visible, the more likely investors are to use multi-benefit appraisal criteria, technical staff are to rely on integrated data sets and decision makers are included to strengthen institutional coordination mechanisms. This can make it easier for finance, data and governance reforms to reinforce and drive one another.

Realizing this synergistic interplay between different enablers will require ensuring that city and regional governments are recognized as platforms that can execute integrated planning and investment through clear mandates, stable financing, technical assistance and access to data and skilled human resources. In addition, serving as an implementation platform can also have positive effects on other urban and rural areas. Recognizing interdependencies between cities and surrounding areas, and institutionalizing arrangements through which resources, food, energy and natural capital complement one another, can strengthen regional self-reliance and resilience in parallel. By leveraging these urban-rural linkages (as suggested in discussions of the circulating ecological sphere (CES) in Chapter 5), synergistic models proven in urban centres can be adapted to the diverse environmental and social contexts of surrounding regions.

It is also important to emphasize that empowering cities as implementation platforms works best when there is close cooperation between levels of decision-making and other stakeholders. National governments can provide direction and rules; subnational governments deliver on the ground; the private sector and civil society contribute innovation and social implementation. When whole-of-government and whole-of-society approaches function as an everyday institutional reality, localized successes can be scaled across progressively wider areas and results can accumulate over time.

Strategic direction 3: Promote cross-sectoral investment by aligning finance with multi-benefit outcomes across climate, biodiversity, pollution and other development priorities to drive systemic changes.

Financial flows will need to be re-allocated from ‘sector-specific, short-term results’ toward ‘system transformation and multiple outcomes’. The current financing architecture often prioritizes single metrics and near-term outputs, placing investments aimed at simultaneous gains across domains at a relative disadvantage. This can create a paradox in which money moves, but transformation stalls. What is needed is to standardize, as core investment criteria, the pursuit of multiple outcomes at once, avoidance of trade-offs, reduction of future risk, implementability and the durability of operation and maintenance. To achieve this, financing should be structured to reward multiple outcomes, as seen in the financial system transformation for climate resilience in Fiji (see Chapter 6, case 1) and the energy efficiency market transformation through blended finance in India (see Chapter 6, case 2), both of which successfully aligned market incentives with development and environmental goals. Redesigning finance is both needed to drive implementation and serve as a lever for transformation.

Integrated national financing strategies, the catalytic role of public finance, blended finance, risk-sharing and guarantees, outcome-based instruments, and robust classification and disclosure frameworks are important means to that end. These are not merely approaches for mobilizing more funding. When finance changes, the scale and speed of implementation can change, which strengthens local efforts and lowers barriers to delivery. Investment not only produces results; it shapes policy direction.

At the same time, fiscal and market signals will need to be realigned with synergies. Institutional incentives that implicitly advantage unsustainable or siloed activities should be reformed so that resources shift toward more desirable investments. This should be treated not as an ‘environmental cost’, but as a deliberate policy choice that can strengthen multiple development outcomes such as health, competitiveness, resilience and the maintenance of natural capital.

Strategic direction 4: Transform data and tools into accessible and actionable resources for routine decision-making on synergies.

The region will need data, tools and capacity that can manage complex interlinkages to ensure that decision-making is continuously updated through learning. At present, climate, biodiversity, pollution, health, urban and social indicators are often managed in separate data systems and evaluation is frequently pulled back into sectoral reporting. As a result, the value of initiatives that lift multiple outcomes simultaneously is not sufficiently demonstrated and course corrections can be delayed.

What is needed is a data foundation that enables cross-domain analysis, tools that visualize interlinkages and trade-offs, integrated scenario and risk assessments, and, most critically, an operational architecture that connects these to day-to-day policy and investment decisions to broader synergistic strategies and planning processes. Policymakers can utilize established platforms such as the SDG Interlinkages Analysis and Visualisation Tool applied in Viet Nam (see Chapter 7) to reveal system-wide causalities, or adopt citizen science models like Litter Intelligence in New Zealand (see Chapter 7) to fill evidence gaps through community engagement. The key is not sophistication for its own sake, but usability: tools that are repeatedly applied in practice and that translate into updated choices. Rather than waiting for perfect data or models, systems should be put in place that enable iterative learning, transparent and timely course correction, and strengthen science-policy interfaces.

Moreover, what should be tracked is not only outcomes. Indicators of implementation capacity also matter, including the extent to which cross-ministerial agreements and stakeholder participation mechanisms are institutionalized; how much discretion and finance have moved to subnational levels and how far information is disclosed and accountability ensured. Making implementation capacity visible can accelerate learning, build trust and enable continuous updating.

Strategic direction 5: Institutionalize whole-of-government and whole-of-society governance approaches, with clear mandates, shared indicators and aligned incentives.

Responses to compounded crises should be embedded as a whole-of-government priority, shifting away from *ad hoc* cross-ministerial collaboration toward institutional arrangements that do not depend on individual effort. If ministerial silos, fragmented fiscal systems and inconsistent regulatory frameworks persist, collaboration tends to remain temporary and crisis responses become a process of continually extinguishing fires.

This calls for institutionalizing permanent cross-ministerial coordination bodies, common key performance indicators, budget and public investment review processes, *ex ante* checks for trade-offs within policy evaluation and updating processes grounded in transparency and accountability. The institutionalized “co-control” mode for air pollution and carbon dioxide (CO₂) emissions in China (see Chapter 8) and the Bio-Circular-Green model for value chain innovation in Thailand (see Chapter 4) provide practical examples of how to break institutional silos and coordinate efforts across ministries. The key is not aiming for ‘coordination’ as an end in and of itself but making coordination part of a learning

process that changes decisions, reallocates resources and improves implementation. While deeper integration may not be achievable in one step (and may need to proceed gradually), implementation can gain continuity if there is an institutional pathway that enables gradual deepening through tactical approaches that promote experimentation and learning to partnerships that build trust and understanding.

A whole-of-society approach, moreover, remains a critical enabler of inclusive and participatory governance, as policy decisions have far-reaching impacts across all segments of civil society, including youth, women, Indigenous Peoples and local communities, as well as academia, business and the private sector. Meaningful and sustained multi-stakeholder participation is essential to reduce barriers to the implementation of rights-based approaches, promote and respect environmental and human rights, and ensure inclusive, accountable and effective policy implementation in the interest of present and future generations. The establishment of structured platforms for inclusive collaboration, consultation and peer-learning throughout policy design and implementation can further strengthen whole-of-society engagement and enhance governance arrangements in an innovative, inclusive, transparent and resilient manner.

Strategic direction 6: Leverage regional cooperation to synthesize evidence, harmonize approaches, promote learning and scale synergistic solutions across diverse contexts.

Regional cooperation should be understood not as something outside domestic priorities, but as a condition for domestic implementation to succeed at scale. Air pollution, marine pollution, river basin management, ecosystem connectivity, supply-chain environmental pressures and disaster risks cascade across borders.

Isolated national efforts cannot keep pace with the speed of these challenges. Regional cooperation can increase the scale and speed of implementation not only through finance and technology transfer, but also through common standards, co-investment, harmonized monitoring, early warning systems, knowledge-sharing platforms and data interoperability. Effective frameworks for such cooperation include the Ganges-Brahmaputra-Meghna basin multipurpose water resource management (see Chapter 7), the Pacific regional environment data and governance via the Secretariat of the Pacific Regional Environment Programme (SPREP) (see Chapter 8), and cooperation on transboundary water management between China and the Russian Federation (see Box 9.1). Furthermore, regional initiatives such as the preparation of an *ASEAN-Japan Global Stocktake Report* (see Chapter 2, section 1) aimed at highlighting practical pathways that align decarbonization with economic growth and human well-being in the preparation for the second Global Stocktake (GST) and reflect them in the COP negotiations.

What matters is avoiding the view that regional cooperation is an outward-facing activity that competes with domestic priorities. It is rather a mechanism that can expand national and local capacities to achieve national and local synergistic objectives. As standards and assessment methods become more aligned, investment uncertainty can decline and capital can flow more easily. As data and technology become more interoperable, policy learning can accelerate and the cost of trial-and-error can fall. Furthermore, if regionally agreed priority actions and means of implementation are shared, policy coherence will be strengthened, and it will become easier to strategically align support and investment. It is also important to strengthen existing regional frameworks and platforms, so they function as hubs that support cross-sectoral work that lie at the heart of synergies, rather than remaining limited to single-sector activities.

Box 9.1 Transboundary water cooperation between China and the Russian Federation

Working on synergies can often help address challenges that cut across administrative and physical borders. A Working Group on Cooperation in Flood Control established under the Joint Chinese-Russian Commission exemplifies the potential to achieve multiple benefits when managing water across these borders. Under this working group, experts agreed on procedures for the prompt exchange of information on flood characteristics and on the actual and planned operating modes of the largest reservoirs in both countries. This cooperation helped reduce severe flooding impacts in the Amur River Basin in 2021 and 2024.

Building on this cooperation, an additional working group was launched in November 2024 to coordinate actions during periods of high water and spring freshets. During the 2025 spring floods, regular exchanges of operational data on reservoir operating modes and hydrometeorological forecasts supported efficient decision-making and timely dissemination of information to all stakeholders. The continued strengthening and expansion of international cooperation is further supported by joint scientific visits and conferences that facilitate the exchange of experience in the rational use and protection of transboundary waters.

Source: Federal Agency for Water Resources (Rosvodresursy), the Russian Federation.

9.3 Cross-cutting principles and a mutually reinforcing cycle: ground the transition in inclusion and equity, and update through learning

As a cross-cutting principle running through all strategic actions, inclusion and equity should be embedded as conditions for the transition to succeed. If design is flawed, imbalances in benefits and burdens can widen, triggering social backlash and eroding trust. It is hence essential to institutionalize the meaningful participation of vulnerable groups, such as women, children, youth, Indigenous peoples and informal workers in decision making processes. Furthermore, designing from values people experience directly, such as health, livelihoods, employment and culture, is necessary to make a transition not only environmentally sustainable but socially just and inclusive. Inclusion is both an ethical imperative and a practical condition that shapes the likelihood of policy success. The impact of inclusive design is evident in the e-Sabha digital complaint application in Sri Lanka, which bridges the digital divide for marginalized groups (see Chapter 5, case 4), and in initiatives to formalize and empower informal waste pickers within a national circularity ecosystem in Thailand (see Chapter 4)

At the same time, this transition cannot be delivered by governments alone. The private sector and financial institutions have significant influence over the pace and scale of change through technology, investment, supply chains and capital allocation; however, their actions do not automatically guarantee inclusion and equity. This is why governance frameworks, including those promoting transparency, accountability, participation and impact assessment, are important to establish the conditions for the efforts of diverse actors to move in a desirable direction. Civil society organizations and local communities are vital for making vulnerable perspectives visible, supporting consensus-building and strengthening social acceptance. Academia and research institutions provide the knowledge base for policy design and evaluation. Citizen science, which includes participatory observation and monitoring, can also help capture on-the-ground changes and support learning and improvement.

It is also important to strengthen the institutional foundations for systematically capturing and accumulating the knowledge and practice of diverse actors, and for sustaining cross-cutting learning and improvement over time. For example, establishing a dedicated centre or platform for synergies represents a viable option to enhance the speed and quality of learning. Such a platform would facilitate the sharing of achievements and challenges in policy, investment and implementation, while supporting cross-cutting analysis and capacity-building.

Sustaining transformation, in turn, requires viewing the six strategic actions as a reinforcing cycle. When the organizing principle of planning shifts, investment can shift; when investment shifts, implementation can accelerate; when implementation progresses, learning can improve; when learning advances, governance arrangements can be refined; and regional cooperation can expand. As this cycle strengthens, more ambitious and transformative choices can become feasible.

In this iterative improvement process, trust, transparency and accountability play decisive roles. Where societies can share what worked, where trade-offs emerged, and how course correction was made, learning can accelerate and transformation can endure. Conversely, where failures are hidden and learning remains fragmented, transformation can slow. For this reason, it is necessary to put in place mechanisms that sustain continuous learning and adaptation alongside the pursuit of synergistic outcomes.

9.4 Towards 2030 and beyond: moving synergies from a principle to implementation

The direction set out in this report is not only an acceleration strategy toward 2030, but also a key to redesigning development pathways beyond 2030. Climate risks, degradation of natural capital, tightening resource constraints, continuing urbanization, demographic change and geopolitical tensions will unfold simultaneously, and single-issue solutions will increasingly reach their limits. That is why discussions beyond 2030 will need to shift from integration as an aspiration to integration as everyday practice, moving further toward forms of decision-making, investment and governance that are continuously updated through learning.

The triple planetary crisis is unlikely to be overcome through fragmented policy. The question is not whether we aspire to transformation, but whether we can operate planning, investment, institutions, data and implementation as one system, and keep updating it through learning. The coming years will be decisive for institutionalizing that capability. Whether the region can take structural steps now will shape future prosperity and safety in the Asia-Pacific region, and influence sustainability outcomes globally.

If the Asia-Pacific region can mainstream this transition, it will not only address regional challenges; it will also present an implementable and persuasive model for development discussions beyond 2030. This transition requires translating the policy language of responding to multiple crises at once, generating multiple benefits and aligning diverse actors around a shared vision into real institutions, finance and implementation. That is where the core of the next era of development lies.

Annex: Summary of recommended actions with mapping to the 6 strategic directions

The following multi-objective table extracts the specific recommended actions from the thematic and means of implementation (MOI) chapters (Chapters 2 to 8) and maps them to the 6 Strategic Directions (SD 1 to SD 6) identified in Chapter 9.

SD 1: Make synergies the organizing principle for national development strategies, climate action, biodiversity planning, pollution control and urban policy.

SD 2: Empower cities and subnational governments to serve as delivery platforms for synergistic solutions, supported by predictable finance and technical capacity.

SD 3: Promote cross-sectoral investment by aligning finance with multi-benefit outcomes across climate, biodiversity, pollution and other development priorities to drive systemic changes.

SD 4: Transform data and tools so that learning and updating of synergies become routine.

SD 5: Institutionalize whole-of-government and multilevel governance approaches, with clear mandates, shared indicators and aligned incentives.

SD 6: Leverage regional cooperation to synthesize evidence, harmonize approaches, promote learning and scale synergistic solutions across diverse contexts.

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Ch2. Climate & Health		
Recommendations for national governments	Position health and well-being not only as an outcome but as a central driver for ambitious climate mitigation and adaptation, supported by stronger public support and investments.	SD 1
	Integrate health considerations into NDCs, NAPs and LT-LEDS.	SD 1
	Prioritize the rapid deployment of scalable and low-cost mitigation options that deliver immediate health co-benefits, particularly in areas where climate risks are accelerating and early action can avoid long-term system lock-in.	SD 1
	Strengthen institutional frameworks for climate action that link climate, health and development priorities and national-subnational-local level implementation by, for instance, establishing or strengthening institutional mechanisms that align targets, budgets and implementation responsibilities across sectors.	SD 2, 5
	Embed health, gender and equity indicators into national climate monitoring, reporting, evaluation and learning systems. Integrating these indicators into decision-making frameworks, including national GHG emission inventories and enhanced transparency frameworks, helps ensure that co-benefits reach vulnerable populations.	SD 4
	Empower subnational governments and local actors to implement integrated solutions by providing them with the mandates, resources and technical support needed to implement health-driven climate action in cities, agricultural areas and communities, including through decentralized finance and capacity-building.	SD 2
Recommendations for local governments	Strengthen local leadership to operationalize climate-health action through integrated planning and implementation.	SD 2
	Embed health considerations into local climate action plans, urban development strategies, and food and energy initiatives, prioritizing measures such as heat-resilient infrastructure, sustainable cooling, clean mobility and nature-based solutions.	SD 2
	Develop municipal heat action plans, establish local cooling centres, enforce energy-efficient building standards, expand urban greening programmes and procure low-emission or eco-friendly public transport fleets.	SD 2
	Facilitate participatory planning with communities and local stakeholders can further enhance equity and social acceptance, while collaboration with national authorities and development partners can help mobilize finance, technical assistance and capacity-building, including through mechanisms such as Voluntary Local Reviews and integrated monitoring frameworks.	SD 2

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Recommendations for development partners	Align climate, health and development finance to support integrated action in blended finance, concessional lending and results-based mechanisms to reduce upfront costs and mobilize private investment for integrated solutions.	SD 3
	Design financing instruments that recognize and reward climate-health co-benefits, including avoided health costs, improved productivity and resilience gains.	SD 3
	Support capacity-building and technical assistance for the design, implementation and monitoring of integrated climate-health interventions by providing technical assistance, strengthening data and reporting systems, and supporting pilot projects that demonstrate scalable approaches.	SD 4
	Leverage international cooperation mechanisms under the Paris Agreement, including Article 6 approaches, to mobilize finance and technology for integrated climate-health solutions.	SD 3, 6
	Ensure that such mechanisms incorporate safeguards and indicators that capture health, equity and sustainable development outcomes alongside emission reductions.	SD 3
Recommendations for regional cooperation	Support regional responses to shared climate and health risks through, for instance, facilitating joint risk assessments, early warning systems and coordinated responses that enhance collective resilience.	SD 6
	Strengthen regional platforms for knowledge exchange and peer learning on climate-health synergies, building on existing regional programmes and initiatives, such as the Asia-Pacific Regional Action Programme on Air Pollution, the Asia-Pacific Clean Air Partnership or the Better Air Quality Conferences.	SD 6
	Promote harmonized approaches to data, metrics and standards and methodologies for assessing climate-health impacts, enabling comparability and reducing transaction costs.	SD 4, 6
Ch3. Nature & Biodiversity		
Recommendations for national governments	Update and scale NBSAPs in full alignment with the KMGBF and relevant MEAs. Nature-positive transitions must be centralized within NDCs and NAPs to ensure a coordinated, whole-of-government response to climate, biodiversity and land degradation.	SD 1
	Adopt cross-ministerial planning to apply the nexus approach at the national level. This can facilitate the maximization of synergies between biodiversity management, climate change mitigation and resource circulation. Such planning involves integrating biodiversity targets into core economic and SDG strategies to break down traditional sectoral silos.	SD 5
	Transition toward a 'nature-positive economy' by reforming subsidies and implementing fiscal incentives for regenerative practices. Beyond GDP, Governments should adopt metrics like inclusive wealth to reflect the true value of natural capital in national accounts.	SD 3, 4
	Formalize the recognition of Indigenous and local knowledge by integrating intrinsic, relational and instrumental values into policy. Empowering Indigenous peoples and local communities as co-managers strengthens nature-connectedness and ensures the sustainable stewardship of biological resources.	SD 1, 5
	Foster public understanding of the interconnections between biodiversity and natural capital, climate change and resource circulation across society, and establish decision-making mechanisms that integrate these perspectives.	SD 1
Recommendations for local governments	Localize biodiversity goals by developing local biodiversity strategies and action plans that align with national and global frameworks, ensuring coordination with departments beyond the environmental sector to foster urban-rural resilience.	SD 2
	Establish experimental 'policy labs' that demonstrate how nexus and transformative approaches work in practice. This can include initiating local pilot projects to co-design NbS with Indigenous peoples and local communities that provide simultaneous co-benefits for water security, food systems and public health.	SD 2, 5
	Implement local incentive mechanisms to bring funding for nature-positive solutions. Deploy tools such as payment for ecosystem services to reward sustainable stewardship in the agriculture, forestry and fisheries sectors.	SD 2, 3

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Recommendations for development partners	Mainstream 'nexus financing' into project planning. Shift from siloed, single-sector funding toward multi-objective finance facilities. Projects should be required to demonstrate measurable co-benefits across the biodiversity-climate-health nexus to stabilize Earth's life-support systems.	SD 3
	Support the use of tools and build capacities for pluralistic planning. Provide technical and financial assistance to help countries localize the NFF, to move from 'business-as-usual' trajectories to 'desirable futures' that prioritize nature-human harmony and the balanced use of the diverse values of nature.	SD 4
	De-risk private investment in NbS. Use blended finance and guarantees to encourage the private sector to invest in NbS, particularly in resilient infrastructure and sustainable supply chains. Ensure strict adherence to the rights and knowledge-sharing protocols of Indigenous peoples and local communities.	SD 3, 5
	Build capacity for integrated monitoring of NbS and nexus approaches. Assist governments in developing advanced data systems that track the quality of nature's contributions to people and ecosystem integrity, rather than focusing solely on species loss.	SD 4
Recommendations for regional cooperation	Establish a regional NbS partnership to harmonize standards, facilitate transboundary data-sharing and create a regional taxonomy for nature-positive investments.	SD 3, 4, 6
	Strengthen transboundary ecosystem management. Enhance joint governance frameworks for shared natural assets, including major river basins (e.g., the Mekong river basin), migratory corridors and marine ecoregions like the Coral Triangle.	SD 6
	Expand regional knowledge hubs. Utilize platforms such as the ASEAN Centre for Biodiversity as regional clearing houses for nexus-based best practices and ILK-led conservation models.	SD 6
	Adopt regional 'nature-positive' targets grounded in nexus framing. Formalize a regional commitment to the 30by30 goal (related to KMGBF Target 3), specifically prioritizing biocultural landscapes and community-led conservation over exclusionary 'fortress' protection models.	SD 6
Ch4. Pollution & Circular Economy		
Recommendations for national governments	Focus policy effort on high-impact provisioning systems of food, housing, mobility and energy, where circular interventions deliver the strongest combined gains for pollution reduction, well-being and economic development.	SD 1
	Empower cities and subnational governments as delivery hubs, with clear mandates, stable finance and technical capacity to coordinate circular economy action across sectors and stakeholders.	SD 2
	Reorient fiscal and regulatory incentives toward prevention and value retention, including by strengthening extended producer responsibility, removing environmentally harmful subsidies and introducing pricing instruments that internalize pollution costs.	SD 3
	Adopt integrated monitoring frameworks, moving beyond single-issue indicators to track combined environmental, social and economic outcomes, and enable adaptive, evidence-based policymaking.	SD 4
	Institutionalize circular economy-pollution synergies in core development strategies, aligning waste, air and water quality, climate, industrial and social policies around material efficiency, circularity and well-being.	SD 1, 5
Recommendations for local governments	Focus policy effort on high-impact urban provisioning systems of food, housing, mobility and energy through place-based demonstration projects, living labs and pilot districts where integrated circular solutions can be trialled, evaluated and refined before scaling.	SD 2
	Establish and support circular hubs and innovation platforms that bring together municipalities, SMEs, start-ups, universities, informal workers and community organizations to co-develop and prototype circular business models, industrial symbiosis initiatives and low-emission infrastructure solutions.	SD 2
	Use municipal finance and procurement strategically to de-risk experimentation, providing seed funding, outcome-based contracts and flexible regulatory arrangements that enable circular demonstration projects to move from pilot to mainstream implementation.	SD 2, 3

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Recommendations for local governments <i>continued</i>	Develop robust local monitoring and learning systems that capture environmental, social and economic impacts of pilot initiatives, enabling iterative improvement, transparent communication of results and structured pathways for replication across cities and provinces.	SD 2, 4
	Institutionalize experimentation as a fundamental governance role, integrating circular economy-pollution synergies into urban innovation strategies, regulatory sandboxes and adaptive planning frameworks that enable cities and provinces to trial new models for material efficiency, waste reduction and low-pollution service delivery.	SD 2, 5
Recommendations for developmental partners	Prioritize funding for synergistic system interventions, shifting from single-issue pollution projects toward integrated programmes that combine circular economy, climate, health and social objectives.	SD 3
	Mobilize private finance through catalytic instruments, such as guarantees, concessional finance and performance-based mechanisms that lower risks for circular business models and SMEs.	SD 3
	Invest in regional public goods, including material flow and pollution data systems, monitoring methodologies and analytical capacity aligned with International Resource Panel frameworks.	SD 4, 6
	Position the Asia-Pacific region as a global front-runner, using multilateral platforms to translate regional innovation in circular economy and pollution reduction into globally transferable development models.	SD 6
	Support upstream policy and institutional reform, including governance alignment, fiscal reform and regulatory capacity-building, alongside investments in physical infrastructure.	SD 5
Recommendations for regional cooperation	Coordinate regional responses to shared pollution challenges, such as open waste burning, marine litter and construction-related emissions, explicitly linking them to circular economy solutions.	SD 6
	Scale and replicate proven national- and city-level initiatives using regional platforms to facilitate peer learning, joint pilots and adaptation across diverse contexts.	SD 6
	Harmonize regional standards and policy frameworks for circular economy and pollution control to reduce fragmentation and prevent the transboundary displacement of pollution and waste.	SD 6
	Strengthen regional knowledge and data infrastructure, including shared metrics, analytical tools and training programmes that support consistent implementation and evaluation.	SD 4, 6
	Use regional cooperation to de-risk investment, developing common project pipelines and blended finance mechanisms that attract private capital into circular infrastructure and services.	SD 3, 6
Ch5. Cities & Resilience		
Recommendations for national governments	Integrate measurable urban resilience and climate-biodiversity-pollution indicators into national development strategies, Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), National Biodiversity Strategy and Action Plans (NBSAPs), and SDG reporting frameworks, ensuring that urban systems are explicitly reflected in national targets and monitoring mechanisms.	SD 1, 2, 4
	Enact national resilience legislation that defines clear local government mandates for risk-informed urban planning, ecosystem protection, pollution control, data-sharing and equitable access to climate finance, with accountability mechanisms for implementation.	SD 5
	Establish a coordinating body on city resilience to align key ministries (environment, housing, transport, energy, finance, planning) under shared resilience and decarbonization targets, supported by integrated budgeting and cross-sectoral performance frameworks.	SD 5
	Issue national policy guidelines, regulatory standards and fiscal incentives to accelerate adoption of NbS, circular economy systems, climate-responsive buildings and low-carbon infrastructure at the subnational level.	SD 1, 2, 3
	Strengthen fiscal decentralization frameworks by expanding predictable, formula-based intergovernmental transfers linked to resilience performance, results-based budgeting and measurable SDG-aligned urban outcomes.	SD 2, 3, 5

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Recommendations for local governments	Implement integrated urban and territorial plans that align land use, housing, transport, energy, water and waste systems under a City Resilience Masterplan consistent with SDG 11 (Sustainable Cities and Communities), NDCs, NAPs, Local Biodiversity Strategy and Action Plans (LBSAPs) and national urban policies. These plans should explicitly identify cross-sectoral co-benefits and trade-offs.	SD 2
	Establish multisectoral resilience coordination mechanisms under the mayor's office or the equivalent executive authority to align departments, synchronize budgets, monitor performance indicators and engage communities and the private sector in implementation.	SD 2
	Mandate risk-informed and future-oriented planning, including climate-risk screening, ecosystem impact assessments, pollution inventories and long-term natural resource forecasting for all major infrastructure projects and zoning decisions.	SD 2
	Embed nature-based solutions, circular economy standards and energy-efficiency requirements into building codes, urban design regulations, procurement systems and public investment frameworks, with measurable green-blue infrastructure targets and resource efficiency benchmarks.	SD 2
	Create formal urban-rural coordination mechanisms to jointly manage shared ecosystems and resource flows such as watersheds, coastal zones, food systems, energy corridors and biodiversity networks, ensuring functional territorial integration beyond administrative boundaries.	SD 2
Recommendations for development partners	Align urban financing with integrated climate-biodiversity-pollution outcomes rather than sector-specific investments.	SD 3
	Expand blended-finance instruments, credit enhancement mechanisms and pooled financing models to support secondary and small cities.	SD 3
	Support long-term institutional capacity-building, including technical training and science-policy partnerships in cities.	SD 2, 5
	Develop standardized methodologies to measure cross-SDG co-benefits of urban investments.	SD 4
	Prioritize support for project preparation, municipal creditworthiness enhancement and pipeline development over stand-alone pilot projects.	SD 3
Recommendations for regional cooperation	Harmonize regional standards and guidelines for integrated urban resilience strategies.	SD 6
	Facilitate cross-border ecosystem governance for shared river basins, coastal zones and transboundary airsheds.	SD 6
	Develop harmonized regional data frameworks and interoperable indicators to monitor urban climate, biodiversity and pollution synergies, alongside risk exposure, hazards and social vulnerabilities, enabling consistent measurement of co-benefits and resilience outcomes across countries.	SD 4, 6
	Expand city-to-city peer learning mechanisms focused on implementation, replication and scaling of integrated urban resilience solutions.	SD 6
	Convene regional investment matchmaking platforms linking cities with climate finance, green bonds and technical assistance.	SD 3, 6
	Align regional investment facilities and technical assistance programmes with integrated climate-biodiversity-pollution priorities to accelerate cross-border learning and collective action.	SD 6
Ch6. Finance		
Recommendations for national governments	Operationalize inter-ministerial coordination by establishing secretariats with authority to review and approve public investments based on climate, biodiversity and pollution criteria.	SD 5
	Design an integrated financial system and regulatory levers for integrated planning and actions with co-benefits (for example, the climate action regulatory framework of Fiji).	SD 3
	Repurpose subsidies misaligned with climate, nature, and pollution, redirecting resources toward multi-benefit environmental investments (for example, the redirection of diesel subsidies to solar irrigation in India).	SD 1, 3, 5
	Formulate comprehensive national strategies quantifying total financing requirements across environmental domains, explicitly identifying synergies and trade-offs.	SD 1, 3

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Recommendations for national governments <i>continued</i>	Integrate climate and nature-related risks into the prudential frameworks of banks and financial institutions, including risk disclosure and stress testing (for example, the Monetary Authority of Singapore requires climate stress testing and TCFD-aligned disclosures).	SD 3
	Embed equity, inclusion and just transition mechanisms within national financing strategies, ensuring that the benefits and costs of the environmental transition are distributed fairly across income groups and communities, particularly in economies undergoing structural transformation.	SD 3
	Adopt climate-nature investment taxonomies and sustainable budget tagging systems to systematically classify and track public expenditure across climate, biodiversity and pollution objectives, enabling integrated investment planning and performance monitoring (for example, climate budget tagging in Indonesia).	SD 1, 3, 4, 5
	Create market conditions that reward synergistic approaches such as implementing tiered tax incentives providing progressively greater benefits for projects demonstrating co-benefits across climate, biodiversity and pollution dimensions.	SD 3
	Mandate green public procurement policies prioritizing suppliers with strong performance across multiple environmental metrics. For instance, Japan could introduce preferential capital requirements or green lending ratios for loans that deliver combined climate, biodiversity and pollution benefits (for example, nature-based flood management or industrial decarbonization with water quality improvements).	SD 3
	Leverage corporate disclosure infrastructure to drive capital allocation toward environmental goals by referring to internationally recognized reporting standards, including ISSB's IFRS S1 and S2 for climate and TNFD for biodiversity (IFRS, 2023a; 2023b).	SD 3
	Link carbon pricing with biodiversity conservation objectives to make integrated conservation financially viable (for example, carbon finance for peatland restoration in Indonesia).	SD 3
	Scale-up performance-based finance to target synergistic outcomes, which reduces risks for financial institutions and enables market sustainability (for example, the energy-efficiency programme in India).	SD 3
	Establish sustainability-linked loan programmes through national development banks, offering preferential rates for projects meeting integrated environmental criteria (for example, Korea Development Bank committed new lending to green projects by 2030; the National Bank for Agriculture and Development of India channels sustainability-linked finance to climate-smart agriculture).	SD 3
	Apply tools to monetize synergies through impact scoring by systematizing the creation and verification of synergistic co-benefits of the assets to invest in, to attract impact investors (for example, the Actis Impact Score).	SD 3, 4
Recommendations for local governments	Invest in subnational data collection to generate granular data on emissions, biodiversity indicators and pollution levels, making this data publicly accessible through online dashboards and feeding into national statistical systems to support integrated environmental planning and investment decisions (for example, the Climate Fiscal Framework of Bangladesh; subnational climate budget tagging in Indonesia feeds into its national climate budget tagging system (Bangladesh, Ministry of Finance, 2021; UNDP 2023)).	SD 2, 4
Recommendations for development partners	Systematically invest in training government officials and financial institution staff to design, evaluate and manage projects that deliver co-benefits across climate, biodiversity and pollution objectives.	SD 3, 5
	Support the establishment of specialized technical units within key ministries to develop bankable multi-benefit project proposals, strengthen investment pipeline development, and systematically assess climate-biodiversity-pollution co-benefits in project appraisal, with long-term technical assistance from development partners.	SD 3
	Develop pilot projects in priority sectors, including NbS, sustainable agriculture and climate-resilient infrastructure, to demonstrate synergistic approaches and build learning (for example, JICA's Tamil Nadu Biodiversity Conservation Project integrating ODA loans with biodiversity and livelihood co-benefits).	SD 2, 3

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Recommendations for development partners <i>continued</i>	Build regulatory capacity for integrated risk assessment, enhance financial institution capacity for portfolio impact analysis and develop reporting systems that capture climate-nature-pollution linkages.	SD 3, 5
	Promote harmonized co-benefit metrics across multilateral development banks operating in the region to enable consistent measurement, aggregated reporting and joint financing of synergistic investments.	SD 3, 4
	Promote United Nations voluntary frameworks like Principles for Responsible Banking for the banking community and Principles for Sustainable Insurance for the insurance community to integrate sustainable practices better into operations and build strong peer-to-peer learning networks.	SD 3
	Drive the deployment of blended finance mechanisms at scale, catalyzing private capital for synergistic investments that would not otherwise attract commercial financing.	SD 3
	Identify priority sectors and geographies for deploying guarantees, concessional finance and layered fund structures using public or philanthropic capital to de-risk investments and improve risk-return profiles.	SD 3
	Support the development of local capital markets for sustainable finance, including by providing technical assistance to build enabling conditions, such as sound governance, stable macroeconomic frameworks and investor-ready project pipelines that attract private capital for synergistic investments.	SD 3, 5
	Deploy targeted credit enhancement instruments, including first-loss guarantees, subordinated tranches and blended risk-layering structures, specifically for NbS and biodiversity conservation projects, which face acute bankability challenges due to their public-good character and long return horizons (e.g., ADB's Nature Solutions Finance Hub using first-loss guarantees for NbS across the Asia-Pacific region).	SD 3
Recommendations for regional cooperation	Facilitate peer learning, harmonize standards, enable knowledge transfer and build capacity on synergistic finance.	SD 6
	Work with governments and the private sector to harmonize green taxonomies to include synergy activities (e.g., ASEAN's regional taxonomy version 2.0), including developing standardized methodologies for assessing and valuing co-benefits across climate, biodiversity and pollution dimensions.	SD 3, 6
	Promote the adoption of internationally recognized corporate disclosure standards, including ISSB's IFRS S1 and S2 for climate and TNFD for biodiversity, to drive consistent capital allocation toward environmental goals and enable cross-border comparability of sustainability performance (for example, over 130 companies committed to TNFD reporting in Japan, as of 2024; Green Bond Grant Scheme in Singapore).	SD 4, 6
Ch7. Data & Tools		
Recommendations for local governments	Formalize the use of citizen-generated data and participatory modelling to address data gaps and support real-time, context-specific decision-making.	SD 2, 4
	Establish structured platforms for stakeholder engagement beyond consultation. This can enable co-production of solutions in areas such as urban planning, disaster risk management and public health, while enhancing community ownership and behavioural change.	SD 2
Recommendations for national governments	Invest in integrated data infrastructure and digital platforms that move beyond static reporting towards dynamic planning and scenario analysis.	SD 4
	Mandate ex-ante screening of policy synergies and trade-offs, supported by inter-ministerial coordination mechanisms, to reduce policy fragmentation and avoid unintended impacts.	SD 1, 5
	Build technical and institutional capacity, including data literacy, modelling skills and cross-sectoral coordination, for effective and sustained use.	SD 4, 5
Recommendations for regional cooperation	Support the development of shared data systems, harmonized indicators and cross-border analytical frameworks to assess spillovers and coordinate responses.	SD 4, 6
	Strengthen regional statistical platforms and nexus-based approaches to improve coherence in managing water, energy, food and environmental systems across countries.	SD 6

Chapter / Actor Group	Recommended Actions from thematic and MOI chapters	Strategic Directions
Recommendations for development partners	Aligning finance, technology transfer and capacity-building efforts to strengthen national data systems and analytical capabilities.	SD 4
	Promoting open-source tools, interoperable data standards and comparable metrics across domains can facilitate wider uptake and benchmarking.	SD 4
	Playing a catalytic role in supporting innovation, knowledge exchange and partnerships that extend tool use across sectors and stakeholders.	SD 4, 6
Ch8. Governance		
Recommendations for national governments	Tailor the mode of governance to the scale of the integration challenge and the existing administrative capacity. Tactical mode: Create opportunities for experimental pilots to gather evidence and build stakeholder trust for small-scale initiatives led by a single department, which is highly applicable for local governments. Strategic mode: Establish formal partnerships to address complex issues affecting multiple agencies and large populations. Transformative mode: Institutionalize cooperation through robust legal structures and policy frameworks that embed synergies into the national agenda.	SD 5
	Connect interventions iteratively within and across all levels. Ensure that regardless of the entry point, experimentation should inform strategy and vice versa, recognizing that pathways are not linear, but often iterative.	SD 5
	Foster a culture of social learning. Utilize participatory decision-making and inclusive platforms (e.g., living labs), to surface local knowledge and mitigate trade-offs during the early stages of policy design.	SD 5
	Align incentive mechanisms. Integrate synergistic performance targets into the evaluation criteria for local leaders and government agencies to motivate cross-sectoral action.	SD 5
	Strengthen horizontal and vertical integration mechanisms. Ensure cross-cutting issues are managed coherently across different levels of government.	SD 5
	Start with tactical modes of governance: Begin with experimental initiatives that bring together a small group of stakeholders across a manageable set of related issues.	SD 2, 5
	Seek support from higher levels of governments for scaling: Once a synergistic initiative is successful, request resources and political support from national governments and regional organizations to make it scalable.	SD 5
	Integrate governance indicators into project evaluation and financing. Implement results-based finance that utilizes indicators for synergies to assess progress on institutional reforms.	SD 3, 4, 5
Recommendations for development partners	Promote institutional capacity-building to strengthen synergistic governance. It is also critical to avoid fragmented funding streams.	SD 5
	Establish regional knowledge-sharing platforms on governance. Dedicate these hubs to disseminate best practices and lessons learned, and to facilitate peer-to-peer learning for replicating and scaling successful governance models across borders.	SD 6
Recommendations for regional cooperation	Leverage existing regional bodies for collective action. Use these bodies to strengthen governance for transboundary responses to environmental challenges, shifting away from siloed and sectoral work programmes.	SD 6

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Asia and the Pacific stands at a decisive moment in its development trajectory. Despite some progress, the region is not on pace to achieve the Sustainable Development Goals. The region's pursuit of the Goals is made more complicated by the interrelated crises of climate change, biodiversity loss and pollution, which interact with each other and with broader socioeconomic challenges.

Building on the findings of the Asia-Pacific Synergies Report, in which regional experiences and policy lessons are synthesized, the present document highlights the need for integrated policy responses that recognize the interdependencies between environmental sustainability and socioeconomic development.

Synergies, understood as deliberate efforts to align policies, actions, stakeholders and systems across multiple sustainability domains, offer a cost efficient, equitable and resilient pathway for accelerating progress towards the achievement of the Goals and addressing the triple planetary crisis. In the present document, the secretariat outlines key transformation pathways and enabling conditions for advancing synergistic solutions, including health-centred climate action, nature-positive nexus approaches to development, circular economy approaches across core provisioning systems and cities as key delivery platforms for integrated solutions.

