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Assessing knowledge: methodological assessment of the impact and dependence of business on biodiversity and nature's contributions to people

Summary for policymakers of the methodological assessment of the impact and dependence of business on biodiversity and nature's contributions to people (business and biodiversity assessment)

Note by the secretariat

The summary for policymakers of the methodological assessment of the impact and dependence of business on biodiversity and nature's contributions to people (business and biodiversity assessment) of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, as prepared by the working group, is set out in the annex to the present note. It has not been formally edited. The figures and tables are available in English only.

Annex*

Summary for policymakers of the methodological assessment of the impact and dependence of business on biodiversity and nature's contributions to people (business and biodiversity assessment)

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* The annex has not been formally edited.

[1] Authors are listed with, in parentheses, their country or countries of citizenship, separated by a comma when they have more than one; and, following a slash, their country of affiliation, if different from that or those of their citizenship, or their organization, if they belong to an international organization. The countries and organizations having nominated the experts are listed on the IPBES website.

Preface

The business and biodiversity[2] methodological assessment comes at a time when urgent action is needed to halt and reverse biodiversity loss and when there is increasing recognition of the central role of businesses in creating transformative change for a just and sustainable future. Evidence shows that biodiversity and nature's contributions to people are declining across much of the globe.[3] The Kunming-Montreal Global Biodiversity Framework commits to a whole-of-government and whole-of-society approach to put biodiversity on a path to recovery for the benefit of people and the planet. Businesses[4] have been key to driving innovation and economic growth that has generated rising standards of living, improved health, food security and poverty alleviation, but these benefits have been unevenly distributed across and within countries.[5] Further, unsustainable economic activity and a focus on growth as measured by the gross domestic product, has been a driver of the decline of biodiversity and nature's contributions to people and stands in the way of transformative change.[6] Despite being historically neglected, there is now growing awareness of biodiversity decline and of the increasing risks that further declines pose for society, the economy and businesses.

All businesses depend on and impact biodiversity and can act now based on existing knowledge (**Figure SPM.1**). Improving the knowledge base would allow them to better measure and respond to their dependencies and impacts. Biodiversity has multiple dimensions, from genes to species to ecosystems. Methods exist to analyse impacts and dependencies of businesses on biodiversity, though tying specific business actions to biodiversity outcomes can be difficult. Different methods are appropriate for different levels of business decision-making, at operations, value chain, corporate and portfolio levels. Information about impacts and dependencies can guide businesses and enable reporting, transparency, decision-making and actions to address risks and opportunities, which in turn can lead to improved outcomes for biodiversity and businesses. For businesses to play a central role to halt and reverse biodiversity loss, the current conditions in which they operate need to be fundamentally changed to provide businesses with incentives for the conservation and sustainable use of biodiversity. These conditions affect businesses differently depending for example on their size, resources and influence. Important dimensions of an enabling environment that provides businesses with incentives for the conservation and sustainable use of biodiversity involve policy, legal and regulatory frameworks, economic and financial systems, social values, norms, and culture, technology and data, and capacity and knowledge. Creation of an effective enabling environment can help closely align what is profitable for businesses with what is good for biodiversity and society. An enabling environment requires coordinated, collaborative action through a whole-of-government and a whole-of-society approach.

This assessment reviews and critically evaluates approaches for measurement of impacts and dependencies of businesses on biodiversity and discusses how such information can be used to improve outcomes for biodiversity and nature's contributions to people. The assessment also discusses the role of multiple actors in creating an enabling environment. The primary audience includes governments, businesses and organisations in the financial system. In addition, the assessment is intended to be of value to civil society and Indigenous Peoples and local communities[7]. Businesses have a major role in delivering transformative change to implement global policy goals and

[2] "Business and biodiversity" in this assessment refers to the interconnected relationships of businesses – both individually and collectively – and biodiversity and nature's contributions to people on which they depend and impact.

[3] IPBES (2019). *Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Brondízio, E. S., Settele, J., Díaz, S., and Ngo, H. T. (eds). IPBES secretariat, Bonn, Germany. DOI: https://doi.org/10.5281/zenodo.3831673

[4] For purposes of this assessment, "businesses" refers to entities involved in the production, exchange and distribution of goods or services sold for currency, which includes for-profit businesses (companies or enterprises), state-owned enterprises, social enterprises and Indigenous Peoples and local communities' businesses.

[5] IPBES (2024). *Thematic Assessment Report on the Interlinkages among Biodiversity, Water, Food and Health of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Harrison, P. A., McElwee, P. D., and van Huysen, T. L. (eds.). IPBES secretariat, Bonn, Germany. DOI: https://doi.org/10.5281/zenodo.13850054

[6] IPBES (2024). *Thematic Assessment Report on the Underlying Causes of Biodiversity Loss and the Determinants of Transformative Change and Options for Achieving the 2050 Vision for Biodiversity of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.* O'Brien, K., Garibaldi, L., and Agrawal, A. (eds.). IPBES secretariat, Bonn, Germany. DOI: https://doi.org/10.5281/zenodo.11382215

[7] The term "Indigenous Peoples and local communities" is used in this assessment in accordance with the methodological guidance for recognizing and working with Indigenous and local knowledge in IPBES (version of 5 May 2022) available here: https://www.ipbes.net/modules-assessment-guide

frameworks such as the goals and targets under the 2030 Agenda for Sustainable Development, the Convention on Biological Diversity, the Kunming-Montreal Global Biodiversity Framework, the United Nations Framework Convention on Climate Change and the Paris Agreement.

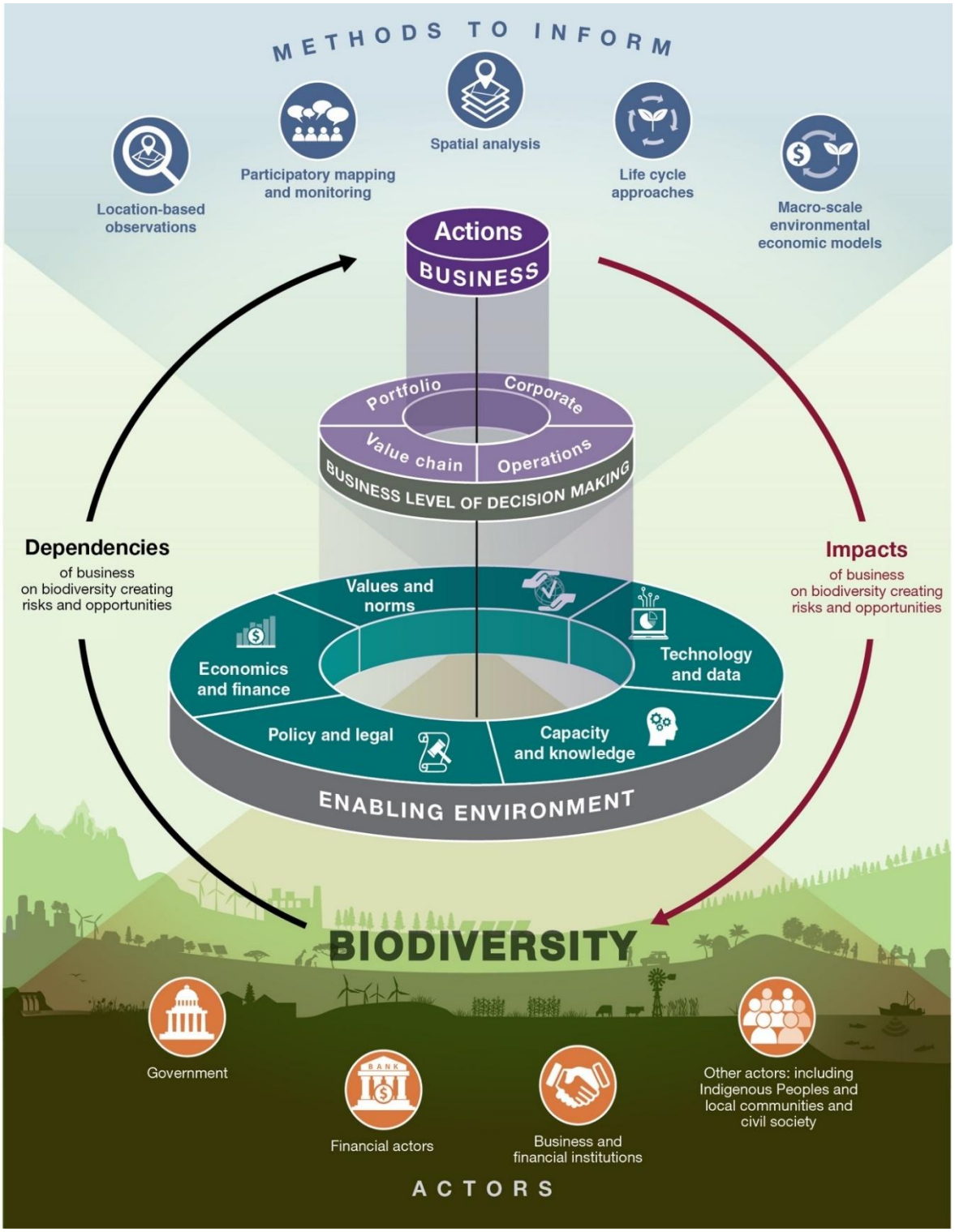


Figure SPM.1 Overview of the business and biodiversity assessment. Businesses both depend on and impact biodiversity creating risks and opportunities. Methods exist to measure business impacts and dependencies. These can be used to inform actions at all levels of decision-making (portfolio, corporate, value chain and operations). Businesses, including financial institutions, working with governments, financial actors, and other actors (including civil society and Indigenous Peoples and local communities), can create an enabling environment. This can be done through changes in policy, legal and regulatory frameworks ("policy and legal"), economic and financial systems ("economics and finance"), social values, norms, and culture ("values and norms"), technology and data, capacity and knowledge {KM10}.

Key messages

KM1 All businesses depend on and impact biodiversity and can be agents of positive change {A1, A2, A4, A5, A6, A8, B7}.

Biodiversity and nature's contributions to people underpin the economy, so all businesses depend, directly or indirectly, on biodiversity. From 1820 to 2022, the global economy grew from $1.18 to $130.11 trillion (measured in 2011 constant dollars). Businesses played a central role in this growth. However, failure to account for nature and integrate its values into economic and financial systems has led to its degradation and unprecedented rates of biodiversity loss, and associated change in nature's contributions to people, including ecosystem services, with 14 out of 18 categories showing declines.[8] Benefits to people and decline in biodiversity have been unequally distributed across and within countries. The decline in biodiversity and nature's contributions to people has become a critical systemic risk threatening the economy, financial stability and human wellbeing with implications for human rights. These systemic risks arising from biodiversity decline underscore the urgent need for transformative change. However, individual businesses often do not act to address their impacts, dependencies, risks and opportunities, in part due to their lack of awareness. Businesses differ in size, sector, structure and relationship with biodiversity, therefore informed action requires specific, context- and sector-dependent knowledge about impacts and dependencies. Because businesses are highly influential and can move quickly when motivated, informed and enabled to do so, they can be agents of positive change.

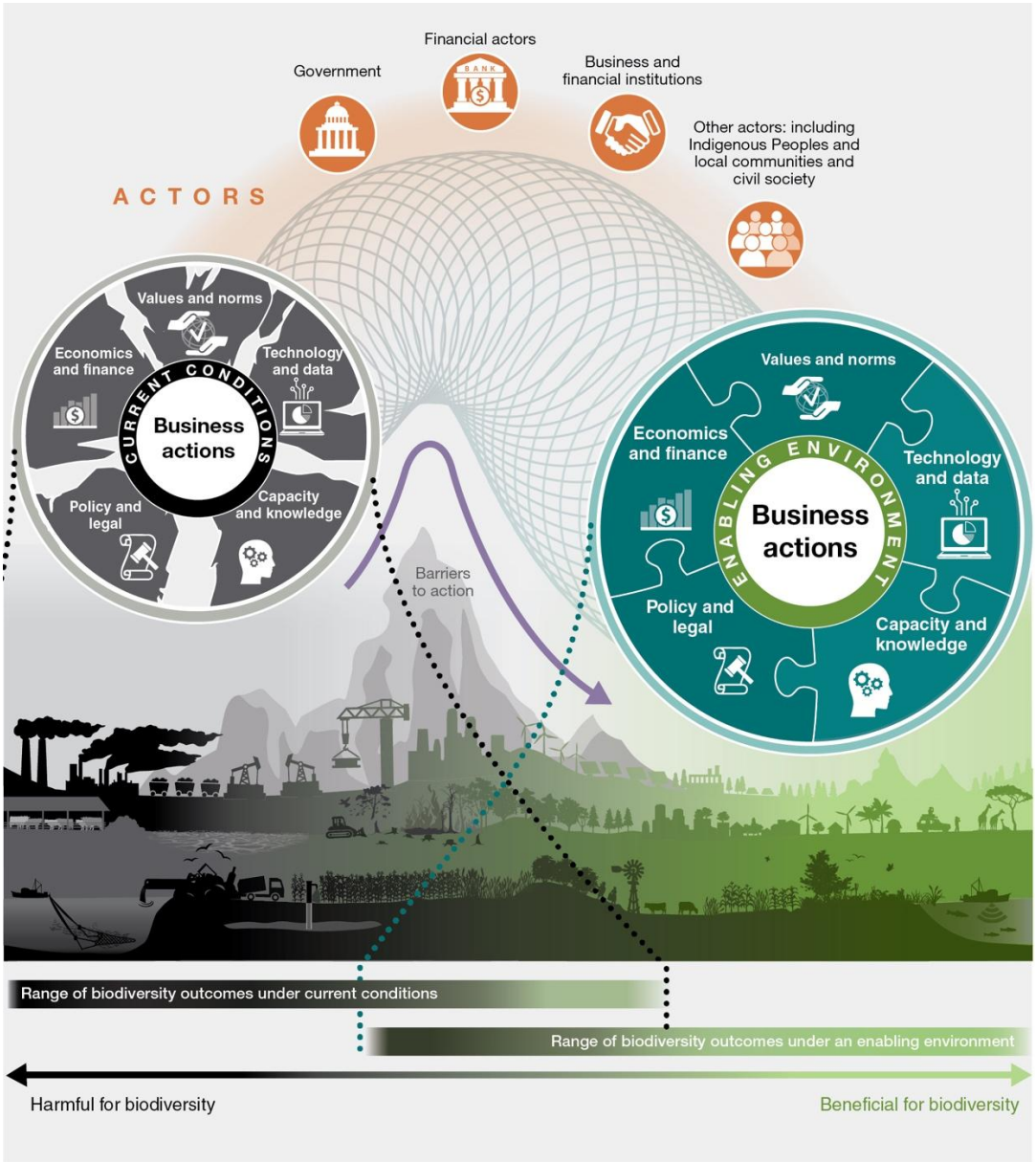
KM2 The current external conditions in which businesses operate are not always compatible with achieving a just and sustainable future and perpetuate systemic risks {A1, A2, A3, A5, B7, B13, C8}.

While some businesses take actions that are beneficial for biodiversity, there are inadequate or perverse incentives that perpetuate business-as-usual and create barriers to businesses and others taking actions that could halt and reverse biodiversity loss as well as address the interconnection with climate change and pollution. The conditions under which businesses operate vary and do not affect all sectors or businesses equally. Currently, there are not adequate rewards and penalties to drive sufficient action by businesses for the conservation and sustainable use of biodiversity and the fair and equitable sharing of the benefits from the utilization of genetic resources and associated traditional knowledge. Businesses often do not internalize negative impacts of business actions on biodiversity. Many policies either encourage business activities harmful to biodiversity or prevent behaviour beneficial for biodiversity. For example, large subsidies are directed to business activities that drive loss of biodiversity often with the support of lobbying by businesses and trade associations with vested interests. In 2023, global public and private finance flows with direct negative impacts on nature were estimated at $7.3 trillion, including environmentally harmful public subsidies and private investment in high-impact sectors. Of this total, private finance accounts for around two-thirds ($4.9 trillion). Public spending on environmentally harmful subsidies is approximately $2.4 trillion. Whereas only around $220 billion in public and private finance flows in 2023 were directed toward activities that contribute to the conservation and sustainable use of biodiversity. This highlights both the opportunity as well as the need to align financial flows to support biodiversity outcomes. Where compliance by businesses and enforcement efforts are lacking, this undermines the effective implementation of laws and regulations. Furthermore, because business disclosures are often voluntary and not widespread, businesses are usually not held accountable. Businesses often lack data and knowledge to quantify their impacts and dependencies on biodiversity, and much of the relevant scientific literature is not written for a business audience. Lack of transparency across value chains, including of the risks and opportunities related to the sustainability of resource extraction, use, reuse and waste management, is a further barrier to action. In addition, ecological cycles such as ecosystem regeneration, do not align with time pressures on decision-making and timescales for investment returns and reporting by businesses - with an emphasis on quarterly earnings.

[8] Global trends have shown declines over the past 50 years for virtually all regulating contributions (habitat, pollination & seed dispersal, air quality regulation, climate regulation, water quantity & flow regulation, water quality regulation, soil formation & protection, hazard regulation and pest regulation) and non-material contributions (learning & inspiration, experience, identity, options), while some material contributions have shown increase (energy, food & feed, materials).

KM3 Collaboration, collective and individual actions are essential to create an enabling environment where businesses contribute to a just and sustainable future {B1, B2, B3, B4, B5, B6, B7, B8, B12}.

In an enabling environment, conditions and incentives under which businesses operate align their interests with what is beneficial for biodiversity and society. Creating an enabling environment involves changes in 1) policy, legal and regulatory frameworks; 2) economic and financial systems; 3) social values, norms, and culture; 4) technology and data; and 5) capacity and knowledge (**Figure SPM.2** and **Table SPM.1**). This can be achieved by accelerating collaboration and collective actions at all levels among and by governments, financial actors,[9] other actors[10], as well as businesses and financial institutions themselves. While recognizing the importance of collaboration, individual actions can still contribute to creating an enabling environment.



[9] In the context of this assessment, "financial institutions" provide financial goods and services to businesses and individuals in the form of loans, insurance and investments, e.g., banks, insurance companies, asset owners and managers, public development banks, and investment funds. The assessment also considers "financial actors" to be central banks, financial regulators and supervisors, and international financial institutions and standard-setting bodies as financial institutions within the broader financial system. The "financial system" encompasses both financial institutions and financial actors, as well as the legal frameworks, regulations, and business practices that govern financial transactions.

[10] In the context of this assessment "other actors" include civil society, Indigenous Peoples and local communities, consumers, non-governmental organizations and international organizations and academia.

Figure SPM.2 Creating an enabling environment would align what is beneficial for businesses with what is beneficial for biodiversity and nature's contributions to people. Business activities impacting biodiversity outcomes are influenced by policy, legal and regulatory frameworks, economic and financial systems, social values, norms, and culture, technology and data, capacities and knowledge. Current conditions often inhibit positive actions and encourage negative actions by businesses with harmful outcomes for biodiversity. Actors, working collectively and individually can overcome barriers.

Table SPM.1 Actions required to create an enabling environment. Actions organised by A. governments, B. financial actors, C. businesses and financial institutions, and D. other actors and by the five components of the enabling environment. Different actors may have different starting points and priorities and applicable actions may vary depending on evolving sectoral and national contexts, priorities, capacity, in accordance with national legislation.

A Government

1. Policy and legal	2. Economics and finance	3. Values and norms	4. Technology and data	5. Capacity and knowledge
A.1.1 Set and enforce policy, legal and regulatory frameworks that incentivize or mandate business and financial institution actions for biodiversity conservation and sustainable use. {B2} A.1.2 Ensure policies are equitable, inclusive, and aligned with international obligations and national capabilities. {B2} A.1.3 Integrate biodiversity criteria into land/marine spatial planning, permitting, public procurement and corporate governance. {B2} A.1.4 Develop and enforce environmental impact assessments, strategic environmental assessments and biodiversity strategies. {B2} A.1.5 Engage in international and regional policy coordination to integrate biodiversity considerations into trade policies and value chains. {B2} A.1.6 Incentivize or mandate corporate disclosure and reporting on biodiversity-related risks, dependencies and impacts. {B2} A.1.7 Ensure regulatory coherence across government agencies ministries and governance levels, as well as across timelines, to mainstream biodiversity. {B2} A.1.8 Implement controls on advertising to prevent greenwashing and combat misinformation. {B2} A.1.9 Ensure fair and equitable benefit sharing, particularly with Indigenous Peoples and local communities, in accordance with national legislation, e.g., for the use of genetic resources and traditional knowledge associated with genetic resources, and by facilitating appropriate access to genetic resources. {B2}	A.2.1 Align fiscal policies and financial flows with biodiversity and sustainability goals. {B3} A.2.2 Through government agencies and central banks, coordinate with other financial actors to align incentives with positive biodiversity outcomes. {B3} A.2.3 Design and implement economic and financial instruments that incentivize conservation and sustainable use of biodiversity. {B3} A.2.4 Eliminate, phase out or reform harmful subsidies. {B3} A.2.5 Support and enhance capacity in research, monitoring, education and nature-based solutions and/or ecosystem-based approaches. {B3} A.2.6 Establish and support financial instruments such as green and blue bonds, conservation funds and public–private partnerships. {B3} A.2.7 Collaborate with financial institutions and actors, and civil society to promote innovative and blended finance for biodiversity. {B3}	A.3.1 Foster inclusive and equitable decision-making frameworks that respect free, prior and informed consent. {B4} A.3.2 Promote ethical and sustainable business practices through regulation of sustainability reporting, standards and incentives for sustainability adoption. {B4} A.3.3 Support awareness and education initiatives that encourage cultural shifts toward sustainability, including sustainable consumption choices. {B4} A.3.4 Promote the use of methods and metrics that allow the representation of nature's contributions to people, including ecosystem services. {C1, C2}	A.4.1 Generate and provide robust biodiversity data using advanced technologies as well as other data collection methods. {B5} A.4.2 Develop and maintain decision-support systems (e.g., forecasting toolkits or national information systems) to help businesses assess impacts and dependencies on biodiversity. {B5} A.4.3 Facilitate biodiversity monitoring systems and provide regulatory incentives to encourage data-sharing frameworks that empower evidence-based decision-making. {B5} A.4.4 Collaborate with businesses, financial institutions, and civil society to develop business-relevant, trusted and streamlined data infrastructure and governance systems for biodiversity information. {B5} A.4.5 Link biodiversity data to national economic accounts, through frameworks such as the United Nations System of Environmental-Economic Accounting, to integrate biodiversity considerations into policy and planning. {B5} A.4.6 Promote the generation of practical and actionable information through standardised, transparent and interoperable approaches, including the need for common data standards and interoperability of datasets. {B5}	A.5.1 Encourage national institutions and government agencies to coordinate intercultural education programs to strengthen understanding between stakeholders. {B3} A.5.2 Lead capacity-building efforts through education, training and public awareness campaigns focused on measuring business impacts and dependencies on biodiversity. {B6} A.5.3 Support mutual learning and collaboration across actors, including businesses, financial institutions and civil society. {B6} A.5.4 Foster research to address gaps in knowledge and its application in the intersection of business and biodiversity. {B6} A.5.5 Develop sector-specific and land/seascape-level training programs to engage multiple sectors in biodiversity management. {B6} A.5.6 Weave Indigenous Peoples and local communities knowledge into capacity-building frameworks with their free, prior and informed consent, as well as local knowledge in accordance with national legislation. {B6}

B Financial actors

1. Policy and legal	2. Economics and finance	3. Values and norms	4. Technology and data	5. Capacity and knowledge
B.1.1 Support consistent risk assessment frameworks for biodiversity-related financial decision-making. {B2} B.1.2 Use regulatory and voluntary mechanisms to ensure financial institutions account for biodiversity-related risks, dependencies and impacts. {B3} B.1.3 Use biodiversity-related measures of impact and dependency to guide allocation of loans, investments and insurance products. {B3} B.1.4 Align fiscal policies and financial flows with biodiversity and sustainability goals. {B3}	B.2.1 Drive systemic change in financial systems to minimize harm, address drivers of loss, and align returns with positive outcomes for biodiversity and society. {B3} B.2.2 Mobilize public and private capital toward biodiversity conservation, restoration and sustainable use projects. {B3} B.2.3 Develop and use innovative financial instruments (e.g., green bonds, high-integrity biodiversity credits, conservation funds, sustainability-linked loans) to fund activities aligned with achieving global biodiversity goals. {B3} B.2.4 For development and international financial institutions: provide technical assistance, conditional or concessional funding and promote blended finance approaches. {B3}	B.3.1 Integrate societal and cultural values that promote conservation and sustainable use of biodiversity into investment, lending and risk management decisions. {B3} B.3.2 Promote responsible lending and investment practices aligned with social norms favouring biodiversity conservation. {B3} B.3.3 Collaborate with civil society to increase transparency and accountability in financial activities and to avoid financing harmful activities. {B4} B.3.4 Engage in voluntary codes or standards that reflect societal expectations on ethical business conduct. {B4}	B.4.1 Generate, use and leverage data and technology to support biodiversity-related impact assessments, risk analyses and financing strategies. {B5} B.4.2 Develop and apply economic models, scenarios, and decision-support tools that integrate biodiversity dependencies and impacts. {B5} B.4.3 Participate in cross-sector data-sharing initiatives to align financial decision-making with biodiversity outcomes. {B5} B.4.4 Use comparable biodiversity accounting methods to evaluate and disclose financial materiality and non-financial value creation, reflecting different ecological and regional context. {B5} B.4.5 Support and invest in data infrastructure and digital tools that promote transparency and comparability in biodiversity-related reporting. {B5}	B.5.1 Offer training programs on biodiversity-related risk assessment and sustainable financing models. {B6} B.5.2 Provide technical assistance, risk mitigation tools and fiscal instruments that build capacity for biodiversity-focused business strategies. {B6} B.5.3 Foster collaboration between financial and non-financial actors to align capacity-building with biodiversity goals. {B6} B.5.4 Development banks lead by example by integrating biodiversity considerations into financial planning and investments. {B6} B.5.5 International financial institutions support capacity-building through technical expertise, knowledge-sharing, and regulatory guidance. {B6}

C Businesses and financial institutions

1. Policy and legal	2. Economics and finance	3. Values and norms	4. Technology and data	5. Capacity and knowledge
C.1.1 Engage responsibly in lobbying and advocacy to support ambitious biodiversity policies, avoiding and discouraging lobbying for unsustainable practices, including harmful subsidies or incentives, that drive biodiversity loss. {B2} C.1.2 Publicly disclose lobbying activities to maintain transparency and trust. {B2} C.1.3 Use established frameworks to report on biodiversity impacts, dependencies, risks and opportunities, including biodiversity accounting methods {B2} C.1.4 Develop and engage in voluntary codes or standards and biodiversity-related corporate governance practices. {B2} C.1.5 Comply with biodiversity-related policies, laws and regulations. {B2} C.1.6 Integrate biodiversity-related risks, opportunities, costs and benefits into business decision-making and financial planning. {B9}	C.2.1 Participate in and benefit from economic instruments and financial incentives that promote biodiversity conservation. {B3} C.2.2 Collaborate with governments and financial institutions in innovative financing mechanisms such as green bonds or high-integrity biodiversity credits to fund activities aligned with achieving global biodiversity goals. {B3} C.2.3 Advocate for inclusive policies and breaking down financial barriers essential for promoting economic equity. {B3} C.2.4 Embrace new economic models that align with the values of Indigenous Peoples and local communities. {B3}	C.3.1 Advocate for and collaborate on coordinated biodiversity disclosure for consumer products. {B4} C.3.2 Engage in partnerships with Indigenous Peoples and local communities, affected communities and youth to promote environmental stewardship and long-term sustainability. {B4} C.3.3 Engage in responsible marketing and communication that supports sustainable consumption patterns. {B4} C.3.4 Engage in voluntary codes or standards that reflect societal expectations on ethical business conduct. {B4} C.3.5 Align business operations and strategies with social values, norms, and culture emphasizing sustainability, equity, and inclusivity {B4} C.3.6 Ensure respect for Indigenous Peoples and local communities along with their respective rights, in accordance with national legislation and free, prior, and informed consent and establish mechanisms for Indigenous Peoples and local community participation in decision-making. {B4} C.3.7 Where relevant, align business practices and processes with the concept of benefit sharing, and benefit sharing mechanisms {B9}.	C.4.1 Adopt corporate data disclosure and transparency standards that capture dependencies and impacts on nature. {B2} C.4.2 Generate, use and share biodiversity data to inform decision-making and risk management. {B5}. C.4.3 Drive innovation and leverage new technologies (e.g., bio-based products, monitoring tools, AI-driven analyses). {B5} C.4.4 Collaborate with governments, financial institutions and civil society to develop data governance systems and infrastructure to enable responsible data sharing {B5} C.4.5 Engage with Indigenous Peoples and local communities in data collection and use processes, including free prior and informed consent, in accordance with national legislation {B5, B9}.	C.5.1 Build capacity by investing in education, research, training and exchange knowledge on biodiversity including through industry associations. {B6} C.5.2 Participate in and support training and capacity-building initiatives led by governments, financial institutions and civil society. {B6} C.5.3 Educate consumers on biodiversity-focused strategies informed by knowledge on biodiversity impacts to support sustainable choices {B6} C.5.4 Involve Indigenous Peoples and local communities in training and decision-making processes to enhance intercultural competencies. {B6} C.5.5 Partner with academia and civil society to co-develop and implement training programs and promote awareness on biodiversity. {B6}

D Other actors: including Indigenous Peoples and local communities, consumers, non-governmental organizations, international organizations, and academia

1. Policy and legal	2. Economics and finance	3. Values and norms	4. Technology and data	5. Capacity and knowledge
D.1.1 Influence policy, legal and regulatory environments through advocacy, responsible and transparent lobbying and participation in decision-making and electoral processes. {B2} D.1.2 Promote equitable and inclusive policy design that respects rights, livelihoods and international obligations. {B2} D.1.3 Engage in monitoring of progress and holding governments and businesses accountable for biodiversity-related policies and actions. {B4}	D.2.1 Advocate for, monitor and hold businesses to account for the fair and equitable sharing of benefits from the utilisation of genetic resources. {B3, B4} D.2.2 Engage in partnerships and public–private initiatives to co-design and implement biodiversity-related financial instruments. {B3} D.2.3 Participate in community-based finance or decentralized structures supporting conservation and sustainable use. {B3}	D.3.1 Foster shifts in societal values and consumer choices and demand through education, awareness and advocacy campaigns promoting sustainable lifestyles and consumption. {B4} D.3.2 Promote transparency, accountability and responsible advocacy. {B4} D.3.3 Engage in voluntary disclosure and reporting frameworks to demonstrate alignment with biodiversity goals. {B2, B4} D.3.4 Facilitate collaboration and partnerships across stakeholders to integrate social and environmental priorities. {B4} D.3.5 Provide insights to a range of actors to encourage responsible business and financial practices to incorporate traditional ecological knowledge and relational values of nature. {B4} D.3.6 Advocate for recognition of rights and free, prior and informed consent in business and policy processes. {B4} D.3.7 Advocate to overcome unequal power structures and ensure fair participation in business and decision-making activities. {B4}	D.4.1 Lead and participate in biodiversity monitoring, participatory mapping, and reporting, enhancing transparency and local empowerment. {B5} D.4.2 Leverage technology for biodiversity monitoring, environmental impact assessment, and legal advocacy. {B5} D.4.3 Co-develop technological tools and open data repositories with different actors to improve access to biodiversity information. {B5} D.4.4 Use campaigns and collaborations to promote responsible data use, combat misinformation, and raise awareness on biodiversity issues. {B5} D.4.5 Contribute Indigenous and local knowledge to biodiversity data systems, ensuring cultural and ecological relevance and applying free prior and informed consent, in accordance with national legislation. {B4} D.4.6 Develop community-owned databases that safeguard traditional knowledge and respect intellectual property rights. {B5} D.4.7 Advocate for equal access to technology and internet infrastructure to support participation in biodiversity monitoring and decision-making. {B5} D.4.8 Use on-the-ground data collection through bottom-up approaches, which include traditional methods. {B5, C2}	D.5.1 Lead education and awareness campaigns for the public and consumers on biodiversity impacts and sustainable choices. {B6} D.5.2 Act as a bridge among governments, businesses and financial institutions to facilitate knowledge exchange and shared understanding. {B6} D.5.3 Collaborate across civil society to strengthen biodiversity literacy and cross-sectoral engagement. {B6} D.5.4 Design and deliver mutually supportive capacity-building programs tailored to Indigenous Peoples and local communities. {B6} D.5.5 Promote intercultural competence training and highlight the value of Indigenous knowledge systems. {B6} D.5.6 Empower communities to participate in decision-making processes related to business and biodiversity. {B6}

KM4 All businesses have a responsibility to address their impacts and dependencies {A3, B7, B8, B9, B10, B11, B12, B13, C1}.

There are many actions that businesses, including financial institutions, can take now to benefit businesses and biodiversity (**Table SPM.2**). The level of responsibility of individual businesses to act is a societal decision[11] and can be informed by the scale of their impacts and dependencies on biodiversity and nature contributions to people, including ecosystem services. Methods exist for measuring both impacts and dependencies of businesses (**Table SPM.5**). Impacts and dependencies can result in risks and opportunities for businesses. By understanding and managing their impacts and dependencies, businesses can reduce risks and deliver positive outcomes for businesses and biodiversity. Understanding and managing impacts can lead to change in business dependencies and understanding dependencies can support actions to address impacts. Historically, business actions to manage negative impacts have mostly been driven by regulation **(Figure SPM.3)**.

Businesses, including financial institutions, can: a) establish corporate governance and strategic frameworks to set direction and enable actions that improve biodiversity outcomes across their operations, value chains and portfolio; b) implement actions at their operations to deliver positive outcomes for biodiversity at the site and land/seascape level, including applying the mitigation hierarchy to avoid, then to minimise, to restore and to offset impacts; c) implement actions for their

[11] "Societal decision" i.e., in relation to globally agreed goals and national contexts, including policy, laws and regulations.

value chain that address impacts and dependencies directly or by influencing others upstream (working with suppliers) and downstream (engaging distributors, retailers and consumers), and d) in the case of financial institutions, shift finance in their portfolio away from harmful activities and towards positive impacts. Through actions at these levels, businesses can contribute to an enabling environment and influence other actors to improve biodiversity outcomes. To avoid greenwashing, it is essential that businesses develop transparent and credible strategies based on understanding their impacts and dependencies, and that they clearly demonstrate verifiable biodiversity outcomes (**Table SPM.2**).

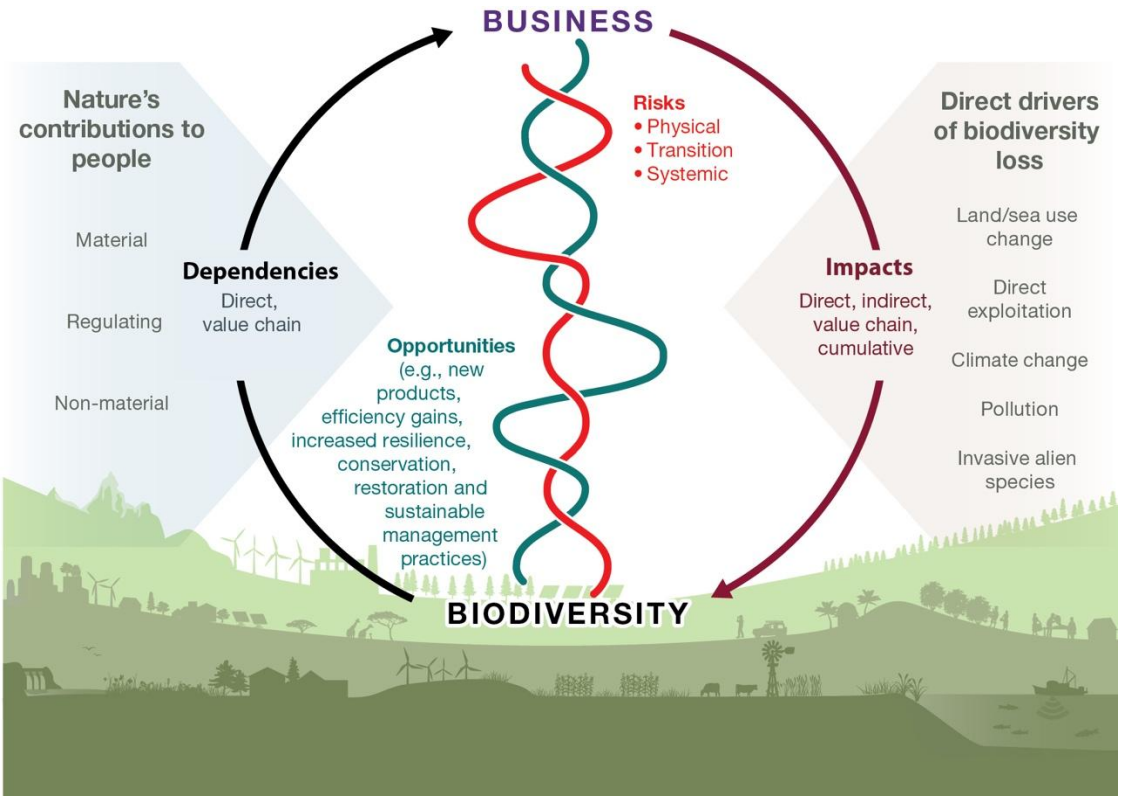


Figure SPM.3 Impacts and dependencies of businesses on biodiversity and nature's contributions to people. Businesses have impacts that can be direct, indirect, through the value chain or cumulative. Business activities contribute to the five drivers of biodiversity change. Their dependencies can be direct or through the value chain and arise from material, regulatory and non-material nature's contributions to people. Risks can be physical, transition or systemic. Opportunities for business include new products, efficiency gains and increased resilience among others. Risks and opportunities may interact and management of risks may create opportunities.

Table SPM.2 Actions that businesses can take now to address their impacts and dependencies. Close links exist between actions implemented across the four decision-making levels. For example, targets set at the corporate level drive actions and outcomes at operations and value chain levels. Across all decision-making levels, actions can be taken individually or collectively, including through collaboration and partnerships.

Level of business decision-making	Examples of actions that businesses can take
Corporate {B2, B9, A3}	• Comply with biodiversity-related policies, laws and regulations • Set ambitious commitments and targets and integrate biodiversity into corporate strategy • Integrate biodiversity-related risks, opportunities, costs and benefits into business decision-making and financial planning • Create policies, develop management systems, and clarify requirements for engagement, measurement, monitoring, reporting, disclosures and assurance. • Establish mechanisms for Indigenous and local community participation in decision-making. • Establish policies and standards to comply with access and benefit-sharing and consent mechanisms, including free prior and informed consent, in accordance with national legislation • Weave Indigenous and local knowledge into operations, resource management and sustainability strategies. • Build staff capacity and board-level environmental leadership. • Establish auditing, monitoring and performance assessment. • Transition the business, build capacity, and ensure adequate resourcing to implement policies and achieve targets. • Innovate in processes, products and services. • Explore and adopt alternative business models. **Additional actions for financial institutions specifically {B12}:** • Set requirements for clients to address impacts and dependencies. • Commit resources to use instruments such as blended finance, green or sustainability-linked bonds and impact investing.
Operation {B11}	• Conduct environmental, social impact assessments and management plans • Develop baselines and monitoring that recognise the multiple values of nature. • Apply the mitigation hierarchy to achieve no net loss of biodiversity or better. • Measure and monitor biodiversity impacts and outcomes of actions. • Identify and meaningfully engage with stakeholders. • Seek free, prior and informed consent, particularly from Indigenous Peoples and local communities, in accordance with national legislation. • Go beyond impact mitigation to engage in landscape conservation, restoration and sustainable management.
Value Chain {B10}	• Map value chain actors and ensure traceability to prioritise and inform action. • Use supplier management systems to set expectations, monitor performance and address non-compliance. • Build relationships and partnerships to improve capacity and drive performance through training, knowledge exchange and innovation. • Integrate communities into value creation activities, such as sourcing, production and distribution. • Engage, educate and incentivise downstream customers, clients and consumers.
Portfolio {B12}	• Assess biodiversity impacts and dependencies. • Engage with businesses within their portfolio to foster actions that improve performance. • Manage biodiversity risk and impacts, for example through stewardship, divestment and/or exclusion.

KM5 Existing methods, knowledge and data for measuring impacts and dependencies already and can further inform decisions and actions, directly and in the value chain {A5, B8, C1, C3}.

The science base for understanding and measuring business impacts and dependencies is already being used to guide business actions. Some businesses already act with existing methods, knowledge and data, and as they are improved, all businesses can take further action. The understanding of how to apply methods for impact assessment is more advanced than for assessments of dependencies. The availability of measurement approaches and underlying data varies by business sector, ecological realm and jurisdiction. The application and uptake of methods is low and uneven across and within business sectors and varies across regions and countries, reflecting differences in data availability and technical capacity.

Different knowledge communities offer credible methodologies that can be applied across diverse business contexts, each contributing distinct approaches for addressing impacts and dependencies. There are many aspects of biodiversity and nature's contributions to people that may be relevant to measuring business impacts and dependencies, including at genetic, species and ecosystem levels and the diverse benefits associated with nature's contributions to people. Which aspects should be measured depends on context, location and action to be taken or decision to be informed. As a result, a combination of methods or metrics, which may include scientific, Indigenous and local knowledge will often be necessary to fully capture biodiversity and nature's contributions to people.

KM6 Different methods to measure and manage impacts and dependencies are needed for different sectors, levels of decision-making and business purposes {A8, B8, C1, C2, C4, C7}.

There is no single method suitable for all business decisions (**Table SPM.3**). Different methods and metrics are needed for different sectors, levels of decision-making and purposes of measurement.

Decisions at the operations level require site-specific information. Site-specific information and data generated through bottom-up[12] approaches includes location-based observations, participatory monitoring and mapping, and spatial analysis built on these data sources. Such approaches can make use of data and metrics representing local values, knowledge, rights and interests of other groups, including Indigenous Peoples and local communities. Bottom-up approaches can provide greater accuracy at local scales and can show how outcomes change in response to concrete actions or activities on the ground. Cumulative impacts, which arise from aggregated effects of businesses and other actors in a location over time, are better assessed for an area, such as a site, a landscape or seascape, than for a particular business.

Top-down methods[13] include life cycle approaches and macro-scale environmental economic models appropriate for decisions at the portfolio, corporate and value chain levels. Depending on the purpose of measurement, they can be conducted with lower spatial resolution data but wider geographic scale. Portfolio-level decisions can be guided by globally comparable methods where there is sufficient resolution within sectors (e.g., differentiating based on geography or product type). Corporate-level decisions can be informed by methods that use company-specific information. Value chain-level decisions can make use of life cycle approaches that assess potential impacts of value chains, noting that they are less relevant for assessing dependencies. Top-down methods provide an assessment of potential impacts and dependencies and inform decisions such as screening and comparing options. However, these methods may have limited ability to track progress resulting from specific business actions. Top-down approaches using coarse resolution data often fail to reflect local ecological values and are less able to represent the diverse values of nature, including the values and interests of Indigenous Peoples and local communities.

As a result of these weaknesses, an important area for future development of top-down approaches would include higher resolution spatial and temporal data and better interweaving with diverse values of nature for understanding dependencies, impacts, risks and opportunities.

KM7 Appropriate methods to measure and manage business impacts and dependencies can be selected based on coverage, accuracy and responsiveness {C1, C2, C4}.

Methods can be assessed as fit for purpose against three overarching characteristics: coverage, accuracy and responsiveness. Coverage refers to both the geographic scale as well as the extent of impacts and dependencies included. To be fit for purpose, a method or combinations of methods need to cover the impacts and dependencies relevant to the activities of a business at the relevant geographic scale. Accuracy is the degree to which the results correctly describe what they are designed to measure. The accuracy necessary to be considered fit for purpose varies by both level of decision-making and purpose of measurement. Responsiveness refers to the ability of the method to detect changes that can be attributed to the actions and activities of the business. To be fit for purpose, a method needs to clearly link changes in biodiversity and nature's contributions to people to specific interventions.

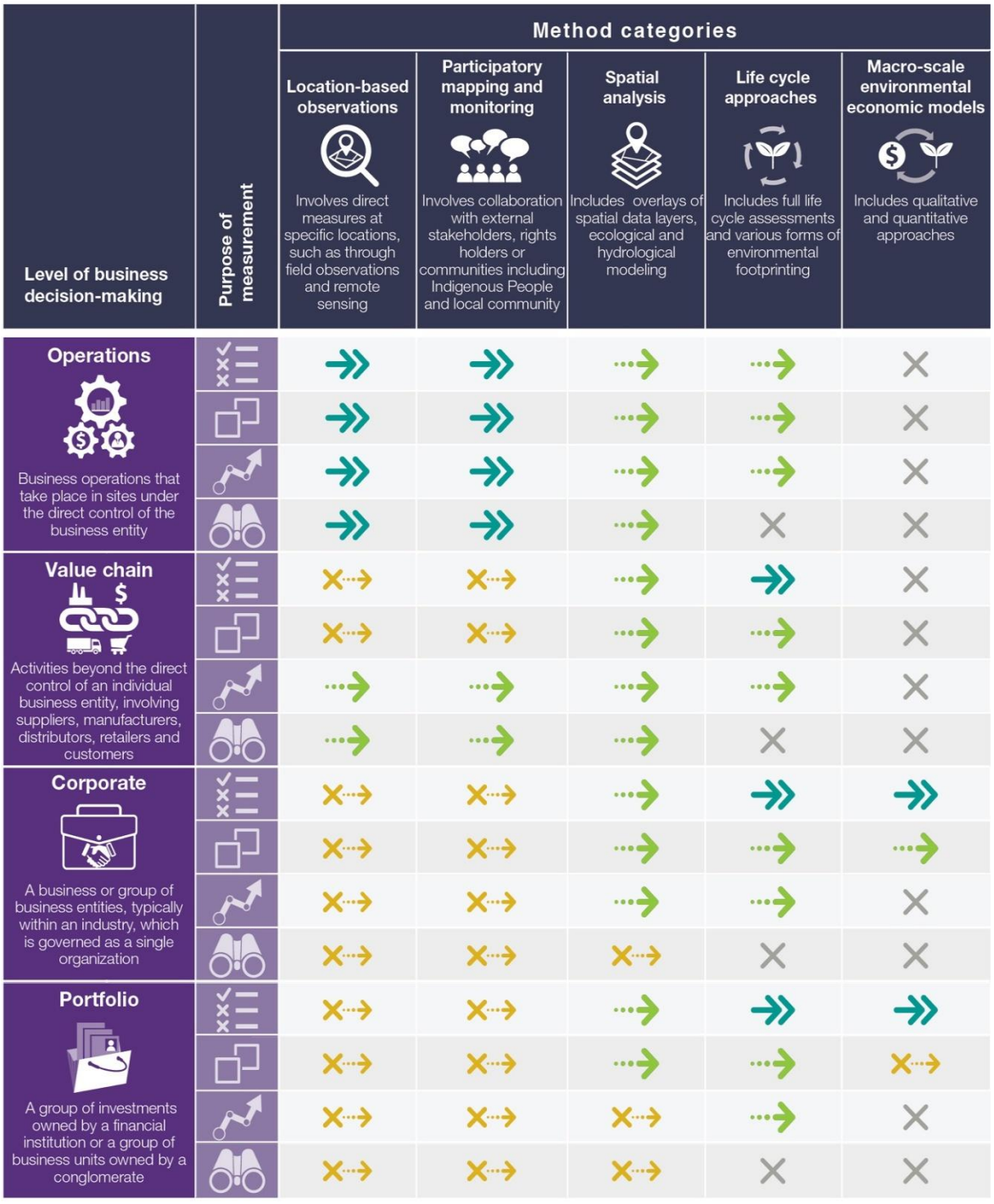
Current available methods do not always satisfy these three criteria for all business applications. Where methods do not meet the necessary requirements, they may not be entirely fit for purpose. However, they may still produce useful information on which businesses can act. These limitations need to be understood by businesses. In addition, methods require different levels of expertise, resources and costs with particular challenges for small and medium enterprises. While recognizing constraints, businesses can start using methods and improve their capabilities over time.

Table SPM.3 Suitability of methods for assessing impacts and dependencies by level of decision-making and purposes of measurement. The categories of methods are not mutually exclusive and represent a continuum rather than strict categories. At each level of decision-making,

[12] Bottom-up methods start from *site-level, species-level, or asset-level observations* and build biodiversity measures from the ground up. They are characterised by high precision and low coverage.

[13] Top-down methods start from *aggregate, system-level signals* (e.g., sectors, regions) and infer biodiversity outcomes or pressures from above. They are characterised by wide coverage and low precision.

methods can be applied for different purposes. Icons indicate the extent to which methods within each category are currently available and applicable, could be applied provided sufficient accuracy, coverage and responsiveness (proceed with caution), or are currently not feasible or not applicable.



KM8 Businesses could better measure and manage their impacts and dependencies by appropriately engaging with science and Indigenous and local knowledge, methods and practices {A5, A7, B5, B6, B10, C3, C4, C7, C8}.

Data and knowledge exist on business impacts and dependencies within the scientific community, among Indigenous Peoples and local communities and within businesses, but these data and knowledge are often siloed and not effectively considered by businesses in decision-making. Scientific literature is not written for businesses and a lack of translation and attention to the needs of businesses has slowed uptake of scientific findings. Among businesses, there is often limited understanding of Indigenous Peoples and local communities as stewards of biodiversity and holders of knowledge on its conservation, restoration and sustainable use. Better understanding could improve business decision-making. Indigenous Peoples and local communities often find themselves inadequately represented in research and decision-making processes. This further undermines their voices and contributions and may result in businesses failing to learn from Indigenous Peoples and local communities. This may have implications for the ability of businesses to comply with access and benefit-sharing mechanisms and approaches. While examples of interweaving Indigenous and local knowledge and scientific methods exist, businesses lack experience working with Indigenous Peoples and local communities to ensure their knowledge is represented, and their values are considered in decisions. Due diligence by businesses involves consent mechanisms, including free, prior and informed consent of Indigenous Peoples and local communities, in accordance with national legislation. Structured collaboration resulting in the sharing and better use of data and information, scientific insights and Indigenous and local knowledge on business impacts and dependencies can translate into better management of business risks and the realisation of opportunities.

KM9 The existing knowledge base needs to be strengthened by addressing important gaps in knowledge and its application {A5, A7, B5, B6, B13, C3, C4, C5, C6, C7, C8}.

Businesses can act now based on existing knowledge, however, limitations remain in the current knowledge base and guidance. Limited quantitative, standardized and comparable estimates of impacts from different businesses constrain the ability of all actors to fully understand and effectively manage business activities. This limitation further prevents financial institutions from choosing investments that minimize negative impacts or maximize positive impacts. Context, scale and sector needs differ and there is a need to develop and disseminate consistent methodological approaches that produce accurate results, particularly for decision-making contexts where the ability to compare or aggregate across sites, value chains or businesses is important. Existing methods have not yet produced a comprehensive and comparable attribution of impacts across all sectors or businesses. The ability of assessments to inform action is hampered by their limited integration into business accounts and processes. Clear gaps in knowledge and its application exist around: a) business-relevant data; b) data accessibility and transparency; c) completeness of evidence; d) adoption of methods; and e) applicability of methods.

Addressing these gaps would contribute to significant improvements in the ability of businesses to measure their impacts and dependencies with implications for their understanding of risks and opportunities. Better understanding could help accelerate actions that benefit both businesses and biodiversity. Priority actions to address gaps can include:

(a) Facilitating greater uptake of existing methods and knowledge by businesses and integration into business accounting and management systems;

(b) Collecting and sharing comparable information, including through disclosure mechanisms, on the activities and locations of businesses, their operations and value chains.

(c) Providing scenarios that support assessment of performance against agreed goals and targets;

(d) Providing actionable guidance for businesses to select methods appropriate for their context and needs;

(e) Co-creating actions based on methods and knowledge built with participatory approaches involving Indigenous Peoples and local communities.

Information that is easily understandable, standardised, transparent, interoperable, practical and actionable provides the foundation on which businesses and financial institutions can choose actions

that are beneficial for biodiversity and society. Turning disclosure and awareness into informed action across the whole of society requires specific, context-dependent knowledge about business impacts and dependencies on biodiversity and nature's contributions to people. In the case of dependencies, mandatory or voluntary disclosure could support scientific advances to accurately measure non-material and regulating nature's contributions to people, which are currently under-represented in tools and approaches. Examples include recreation, learning and inspiration, supporting identities, regulation of pollutants, climate regulation and pollination.

KM10 Creating an enabling environment can incentivise actions that are beneficial for businesses, biodiversity and society for a just and sustainable future {A8, B1, B2, B3, B4, B5, B6, B7, B8, B9, B10, B11, B12, B13}.

Under current conditions, what is profitable for businesses often results in loss of biodiversity and what is good for biodiversity and society is often not profitable. Businesses are motivated to focus on financial materiality to deliver short-term objectives and profitability. This undermines their ability to take actions that address long-term outcomes with system-level implications. To address this problem, efforts have been made to require businesses to consider not only what is financially material but also what is material for biodiversity and society. While this can encourage businesses and financial institutions to consider multiple dimensions when taking decisions, it perpetuates a system built on the idea of trade-offs between profitability and biodiversity. Creation of an enabling environment that provides incentives for the conservation and sustainable use of biodiversity and nature's contributions to people could align what is profitable with what is good for biodiversity and society. Creating this enabling environment would result in businesses and financial institutions being positive agents of change in transforming to a just and sustainable economic system, by addressing their impacts on biodiversity loss, climate change and pollution, which are all interconnected.

Background messages

A. Understanding the relationship between businesses and biodiversity.

A1. Businesses depend on biodiversity, but business actions continue to drive declines in biodiversity and nature's contributions to people (*well established*).

Biodiversity provides goods and services that are essential to the economy and business activities. For example, biodiversity provides raw materials and energy and regulates environmental conditions such as modulating water flows to reduce flooding during wet seasons and providing water during dry seasons. Biodiversity also underpins genetic diversity that can inform research and innovation, and contributes to science, education, and cultural and spiritual values (*well established*) {2.2.1}. Despite its importance, loss in biodiversity and nature's contributions to people has accelerated since the industrial revolution due to rapid economic growth and changes in production and consumption patterns (*well established*) {1.1.2, 1.1.3.}. Economic activity and global trade have increased at a faster pace than human population growth (*well established*) {1.1.2}. The Transformative Change Assessment[6] identified three underlying causes of biodiversity loss: disconnection from nature, concentration of power and wealth, and prioritization of short-term individual and material gains (*well established*) {1.1.4}. Business activities are both shaped by and contribute to these socioeconomic trends and their underlying causes, often in complex and unpredictable ways (*well established*) {3.2.1}. The growing economy continues to contribute to the direct drivers of biodiversity loss (land and sea use, unsustainable direct exploitation of organisms, climate change, pollution, and invasion of alien species, among others), placing increasing pressure on biodiversity and nature's contributions to people (*well established*) {1.1.4}. Measures of biodiversity and nature's contributions to people have shown declines for decades (*well established*) {1.1.1, 1.1.2, 1.1.3, 1.1.4}. Since 1992, human-produced capital (e.g., buildings and machinery) that improves economic productivity has increased by approximately 100 per cent per capita on average with wide disparity among countries while stocks of natural capital (ecosystems and natural resources) have been reduced by nearly 40 per cent (*well established*) {1.1.2}.

A2. Biodiversity losses caused by economic activity put the future of businesses, the economy and global society at risk (*well established*).

The loss of biodiversity and nature's contributions to people, including stocks of natural resources, resulting from unsustainable use threatens the ability of businesses, local economies and whole sectors to function (*well established*) {1.2.9}. The Global Assessment of Biodiversity and Ecosystem Services[3] shows that while biodiversity and nature's contributions to people are providing more food, energy and materials than at any other point in human history, this often comes at the expense of rapid biodiversity decline, diminished ecosystem function, and reductions in many of nature's contributions to the people (*well established*) {1.1.2, 1.3}. Because biodiversity loss is driven in large part by economic activity and by systemic failures to internalize nature's values, the resulting degradation of ecosystems generates physical risks for the very businesses and economic systems that depend on them (*well established*) {1.1.2, 1.3, 1.2.9}. This situation creates pervasive systemic risk affecting the stability of the financial system and the global economy (*well established*) {1.2.9}. Risks associated with biodiversity loss and ecosystem collapse, along with extreme weather events, critical changes to earth systems[14], and natural resource shortages and pollution, are among the highest-ranked global risks over the next 10 years, (*well established*) {1.4.2}. Climate- and biodiversity-related risks may interact to amplify social and economic impacts (*well established*) {1.4.2, 3.5.2}. Such risks affect some sectors directly (e.g., agriculture, tourism and insurance, etc), and all sectors indirectly (*established but incomplete*) {2.5.1, 2.5.5}. These risks may have disproportionate impacts on developing countries whose economies are more reliant on biodiversity and have more limited technical and financial capacity to absorb shocks (*well established*) {1.2.9, 3.5.2}.

[14] According to the World Economic Forum 2025 Global Risks Report https://www.weforum.org/publications/global-risks-report-2025/

A3. Current conditions perpetuate business-as-usual and do not support the transformative change required to halt and reverse biodiversity loss (*well established*).

Business governance, strategies and structures have evolved in response to economic, financial, political and social systems that have commonly ignored or undervalued biodiversity, creating tension between business actions and the conservation and sustainable use of biodiversity (*well established*) {1.1.2, 1.1.4}. For example, time pressures on decision-making and timescales for investment returns and reporting by businesses – with an emphasis on quarterly earnings or annual reporting – are shorter than many ecological cycles (such as ecosystem regeneration) (*established but incomplete*) {5.3.2}. As a result, the loss of biodiversity is not adequately internalised in business decision-making, making it difficult for businesses to justify action under traditional interpretations of fiduciary duty, which typically prioritise short-term shareholder returns (*established but incomplete*) {5.1}.

Markets fail to adequately price or value biodiversity and many of nature's contributions to people, such as filtration of pollutants, climate regulation and pollination (*well established*) {1.1.2}. Therefore, businesses bear little or no financial cost for negative impacts and may not generate revenue from positive impacts on biodiversity (*well established*) {1.1.2}. As a result, there are insufficient incentives for businesses to act to conserve, restore or sustainably use biodiversity (*well established*) {1.1.2, 5.1, 5.3.2}.

Public policy can further accelerate biodiversity decline (*well established*) {5.3.2}. In 2023, global public and private finance flows with direct negative impacts on nature were estimated at $7.3 trillion, including environmentally harmful public subsidies and private investment in high-impact sectors.

Of this total, private finance accounts for around two-thirds ($4.9 trillion). Public spending on environmentally harmful subsidies to economic sectors responsible for biodiversity loss and nature's decline is approximately $2.4 trillion. There are considerable differences between business sectors[15]. Whereas only around $220 billion in public and private finance flows in 2023 were directed toward activities that contribute to the conservation and sustainable use of biodiversity (*well established)* {5.3.2}. Some subsidies are positive for biodiversity outcomes (*well established*) {1.1.2}. Far lower and fewer subsidies are provided to businesses for the conservation, restoration or sustainable use of biodiversity (*well established*) {5.3.2}. Public subsidies that support harmful activities and distort trade can have important economic repercussions for all countries, especially for developing countries, and in some cases may have implications for the capacity of businesses to invest in sustainable activities and practices. Incorporating biodiversity considerations in trade policies is an important lever to create an enabling environment (*established but incomplete*) {1.1.2; 6.1.4}. Some business actions intended to conserve and sustainably use biodiversity and nature's contributions to people, such as modes of sustainable production and consumption, for example, reducing waste or circular economy approaches, can be profitable under the current conditions. This explains why some businesses take some actions that are positive for biodiversity (*established but incomplete*) {5.3.1}. However, such actions alone are not enough to halt and reverse the loss of biodiversity at a global scale (*well established*) {5.1, 5.2.2}.

A4. All businesses across all sectors depend on biodiversity and nature's contributions to people (*well established*).

Business dependencies can result from: i) material inputs to processes and products, such as genetic resources, raw materials and energy; ii) regulation of environmental conditions in which the businesses operate, such as modulation of water flows and control of erosion; and iii) non-material contributions, such as recreational, educational, and spiritual and cultural and aesthetic values (*well established*) {2.2.1, 2.5.2, 2.5.4, 2.9}. Dependencies on material inputs can result in negative impacts to other actors and to the business itself when extraction exceeds levels of sustainable use (*well established*) {2.2.1}. In managing their dependencies, businesses have to navigate complex trade-offs and consider broader societal needs (*established but incomplete*) {2.8}. The magnitude of the dependence and the availability and stability of the supply of nature's contributions to people determines the associated type and level of risk to the business (*established but incomplete*) {2.2.4,

[15] Specific sectors with numbers on financial flows are mentioned in section 5.3.2 of the present assessment report as well as in *United Nations Environment Programme (2026). State of Finance for Nature 2026: Nature in the red: Powering the trillion dollar nature transition economy. Nairobi.* https://wedocs.unep.org/handle/20.500.11822/49119

2.5.5}. Dependencies are not always obvious, for example, while grocery stores and restaurants have little direct dependence on biodiversity, they are part of the agricultural value chain that begins with primary agricultural producers (*well established*) {2.2.1}. Similarly, waste management can depend on microbial communities for the efficiency of solid waste processing (*well established*) {2.2.1}. Dependencies on biodiversity may span long distances (e.g., consumption of traded goods far from production) and time (e.g., timber harvests) (*well established*) {2.2.1}. Many Indigenous Peoples and local communities and their businesses are especially dependent on biodiversity for their livelihoods and wellbeing. Upstream smallholder producers, including women and girls, may have limited capacity to absorb or adapt to negative impacts compared to businesses downstream in the value chain (*established but incomplete*) {1.2.3, 1.2.9, 2.2.4, 2.5.5, 2.7, 3.2.4}.

A5. Understanding of business dependencies on biodiversity and nature's contributions to people across sectors and scales is incomplete and uneven (*well established*).

Sectors with high and direct dependency on biodiversity such as agriculture or extractive industries tend to have financial incentives to consider and measure dependencies because they use or produce raw materials (*well established*) {2.5.1, 3.5}. There is relatively limited consideration of dependencies and associated risk in the value chain and for non-material and regulating contributions. Studies of business dependencies have focused mainly on biophysical data in directly dependent sectors such as agriculture, fisheries, pharmaceuticals and tourism and on readily apparent inputs such as pollination and water (*established but incomplete*) {2.5}. Fewer studies have translated dependencies into monetary valuation (*established but incomplete*) {2.3, 2.4}. Businesses may also be dependent on Indigenous and local knowledge and could learn from Indigenous Peoples and local communities and the ways in which their businesses conserve and sustainably use biodiversity (*established but incomplete*) {2.7}. The understanding of the magnitude of business dependencies is lower than the understanding of business impacts in most regions of the world (*well established*) {2.5, 3.4, 4.5.2}. More evidence is available for Europe, the Americas and Asia than for Africa and Oceania (*established but incomplete*) {2.8}. Better understanding of the magnitude of business impacts and dependencies and associated risks and opportunities could help accelerate actions that benefit both businesses and biodiversity (*established but incomplete*) {2.6, 2.8, 5.3.2}.

A6. All businesses across all sectors have impacts on biodiversity and nature's contributions to people, including through their value chains (*well established*).

Business impacts can be negative or positive; can be direct or indirect through the value chain and operate through a range of drivers that vary by and within sectors and by location (*well established*) {1.4.1, 3.2}. Business activities can affect all dimensions of biodiversity (e.g., genes, species, ecosystems) and nature's contributions to people (material, regulating and non-material contributions) (*well established*) {3.2, 3.4}. Impacts across multiple businesses can have cumulative effects, which can cross ecological tipping points, leading to potentially irreversible biodiversity loss with far-reaching economic, social and ecological consequences (w*ell established*) {1.2.9}. The form, magnitude and reversibility of a business's impacts vary based on the type, scale (spatial and temporal), magnitude, frequency, location and sector of its activities (*well established*) {3.2}. A business's size does not always reflect the magnitude of its impacts (*well established*) {3.2}. To date, business's impacts have been predominantly negative, and many claims of positive outcomes are more accurately described as reductions in negative impacts (*well established*) {3.2, 3.5}. While existing methods do not yet provide a comprehensive and comparable attribution of impacts across all sectors, available estimates identify agriculture, forestry and fishing; electricity, energy; mining and quarrying; construction; and transportation and storage as sectors with relatively high quantified direct impacts (*established but incomplete*) {3.4}. Because the activities of primary sectors are driven by demand from other sectors, businesses and consumers further along the value chain also contribute to these impacts (*well established*) {3.2, 3.4}. Business impacts are frequently assessed using metrics of biodiversity, such as changes in forest cover or mean species abundance. These biodiversity metrics are not necessarily good proxies for impact on nature's contributions to people, including ecosystem services (*well established*) {3.2.1, 3.4}. Fewer studies include the impacts of businesses on nature's contributions to people, as a result the consequences of business activities for human wellbeing, including inter-generational impacts, are often ignored (*well established*) {3.3, 3.4}.

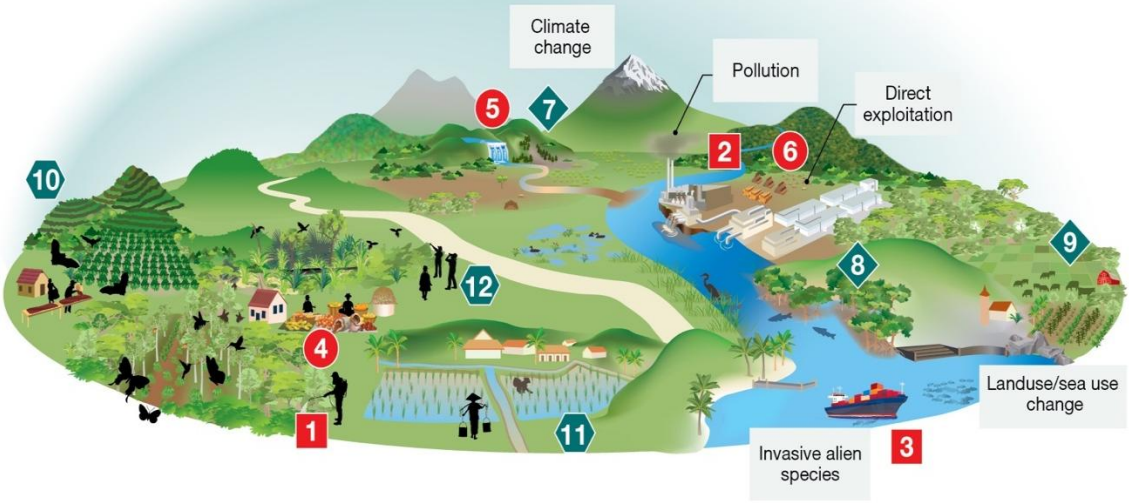
A7. Business impacts on biodiversity and nature's contributions to people have profound impacts on human health and wellbeing, particularly of Indigenous Peoples and local communities (*well established*).

Business impacts on biodiversity can negatively influence the interrelationships between people and nature with potentially long-lasting economic, social and cultural implications (*well established*) {3.2.4}. Women and girls, youth, rural communities and Indigenous Peoples and local communities are especially susceptible to negative impacts from businesses (*well established*) {3.2.4, 3.4.4, 3.5.4}. There is growing recognition that businesses should integrate social and human rights considerations when assessing their impacts on nature {1.4.2}. Industrial development threatens approximately 60 per cent of Indigenous lands globally and nearly one-quarter of Indigenous territories are under high pressure from resource exploitation (*established but incomplete*) {2.7}. These same issues affect local communities {3.2.1}. Demand for minerals vital to the energy transition has escalated these risks, with mining projects frequently being developed in Indigenous and local territories (*established but incomplete*) {2.7}. Some businesses led by Indigenous Peoples and local communities share communal objectives and draw on place-based knowledge, characteristics that make them more likely to have positive impacts (*established but incomplete*) {1.2.3, 2.7.2}. Indigenous and local knowledge offers distinct learnings for businesses, including different ways of conceptualizing and understanding businesses, traditional practices, business principles and ways of operating. Community-based monitoring approaches that interweave Indigenous and local knowledge and scientific methods exist; however, uptake of these approaches by businesses is low (*well established*) {4.3.1}.

A8. Business impacts and dependencies create both risks and opportunities for businesses (*well established*).

Biodiversity loss creates risks for businesses that include physical (e.g., flood damage to facilities), transition (e.g., new regulation) and systemic risks (e.g., macroeconomic and financial shocks). These biodiversity-related risks can interact creating larger risks for businesses (*well established*) (**Figure SPM.4**) {1.4.2, 3.5.2, 3.5.4}. Biodiversity-related risks can have legal and financial consequences for businesses and financial institutions (*well established*) {1.2.9}. The extent to which specific businesses are exposed to risks arising from their dependencies remains understudied (*established but incomplete*) {2.5.5}. Biodiversity-related opportunities can be created by avoiding harm to biodiversity, mitigating negative impacts, delivering positive ones and managing dependencies sustainably, including through restoration, nature-based solutions and/or ecosystem-based approaches (*well established*) {1.4.2, 2.2.4, 3.5.3}. For example, businesses may find opportunities to meet the demand for monitoring and reporting of biodiversity outcomes{3.5.3}. Opportunities can be commercially viable and deliver positive outcomes for businesses, biodiversity and other stakeholders, for example the opportunities from sustainable land management are estimated to potentially quadruple to $737 billion by 2050 (*established but incomplete*) {1.2.10}. When businesses avoid, reduce or otherwise mitigate biodiversity-related risks, risks can turn into opportunities (*well established*) {3.5.3}. Addressing systemic risks and taking advantage of the large opportunities that arise with transformative change requires coordinated actions that go beyond what individual businesses have incentives or resources to accomplish alone (*well established*) {1.2.6, 5.7.3, 6.1.3}. The lack of quantitative assessments of opportunities contributes to low uptake of positive actions (*established but incomplete*) {3.4.3, 5.3.2}. With information and proper incentives, businesses can address biodiversity-related impacts, dependencies, risks and opportunities and contribute to positive outcomes (*well established*) {1.4.2, 3.5.2, 3.5.3, 3.5.4, 5.6.2, 5.6.3, 5.6.4, 5.7.1}. Understanding risks and opportunities has increased with the publication of influential global reports, such as the Global Assessment of Biodiversity and Ecosystem Services in 2019, contributing to the recognition of the loss of biodiversity and nature's contributions to people as a major risk to the global economy (*well established*) {1.1.2, 1.4.2, 2.4.5}.

Figure SPM.4 Examples of the intersections between impacts, dependencies, risks and opportunities.



	Risks ⊖	Opportunities ⊕
Impacts ■◆	1 Intensive forestry relies on pesticides with negative impact on non-target pollinators creating reputational risk with nearby communities 2 Furniture manufacture discharges chemicals to freshwater ecosystem creating risk of non-compliance with permit 3 Transportation and shipping spreads invasive alien species creating compliance risk.	7 Sustainable forest management reduces soil erosion creating opportunity for payments for ecosystem services from nearby hydropower facility 8 Investments in protection, restoration and sustainable use of mangroves can provide cost-effective alternatives to grey infrastructure. 9 Introducing native trees in pastures devoted to cattle ranching increases milk production and animal wellbeing
Dependencies ●⬢	4 Indigenous-led fruit farm depends on wild pollinators creating risk to crop yield if pollinator abundance falls 5 Hydropower depends on standing forest for soil stabilisation and erosion control creating risk if deforestation leads to increase in sediment 6 Furniture manufacture value chain depends on supply of high-quality timber creating risk if supply fails	10 Coffee farms depend on bats as predators of pests creating opportunities to increase yields with sustainable habitat management 11 Agriculture depends on freshwater abstraction creating opportunity to reduce costs through good management 12 Eco-tourism depends on endemic species creating opportunity to increase income through collaboration with nearby communities to manage habitat

B. Options for action by businesses, including financial institutions, financial actors, governments, and other actors.

B1. Creating an enabling environment for transformative change requires collaborative action from governments, financial actors, other actors and businesses themselves (*well established*).

Current conditions are sufficient to drive some actions by some businesses but are insufficient to achieve transformative change necessary to halt and reverse biodiversity loss (*established but incomplete*) {5.1, 5.3.1, 6.1.3}. Businesses influence and are influenced by conditions created through policy, legal and regulatory frameworks, economic and financial systems, social values, norms, and culture, technology and data, and capacity and knowledge (*well established*) {5.3, 5.7}. Changing these conditions, including through alternative models and measures of economic welfare, such as bioeconomy, circular economy, degrowth, postgrowth, inclusive wealth, and decoupling, can enable transformational action by businesses to address the underlying causes of biodiversity loss (*well established*) {5.3, 5.4, 5.6, 5.7, 6.1.2, 6.1.3}. Creating such an enabling environment can be achieved by accelerating individual and collaborative actions at all levels by governments, financial institutions

and other actors[16] as well as businesses themselves through a whole-of-government and a whole-of-society approach (*well established*) {5.6, 5.7, 6.1.3, 6.1.4}.

Changes, particularly those promoted by governments through public policies, alongside financial incentives, and social values and norms could align what is considered financially material to the businesses with what is considered material to biodiversity and society (*well established*) {5.3, 6.3}.

Changes in conditions to create an enabling environment will impact businesses differently depending on their scale (size of the business or footprint), structure, sector, maturity and relationship with biodiversity. Informal business sectors and small-, medium- and micro-sized enterprises may be resource constrained, requiring additional support to accomplish biodiversity-related objectives (*established but incomplete*) {5.3.2}. Businesses in developing countries face additional and specific challenges, such as structural barriers, fiscal and financial constraints, the influence of vested interests, a lack of institutional frameworks, a lack of technologies and technology transfer and the need for capacity building, undermining their capacity to invest in technological development and educational initiatives needed to support transformative change (*established but incomplete*) {5.3.2, 6.1.5}.

B2. Policies, laws and regulations set by governments and financial actors can influence businesses to take actions that contribute to the conservation and sustainable use of biodiversity (*well established*).

Governments and financial actors set the policy, legal and regulatory environment in which businesses operate, including mandatory rules (laws and regulations) and voluntary incentives for businesses to take actions that contribute to the conservation and sustainable use of biodiversity (*well established*) {6.1; 6.2.1, 6.2.2}. Financial institutions can support the implementation of these mandatory rules and voluntary incentives (*well established*) {5.3.1; 6.3.1}. Policies, laws and regulations designed in an equitable and inclusive manner, taking into account existing international obligations, different capabilities and levels of development, and avoiding unintended impacts on livelihoods are essential to support the conservation and sustainable use of biodiversity (*well established*) {6.3.1}. Lobbying, advocacy and engagement carried out by businesses, civil society, trade associations and Indigenous Peoples and local communities, along with electoral processes, can influence the policy, legal and regulatory environment (*well established*) {5.7.2, 6.3}.

Measures of business impacts and dependencies can be used to provide evidence for decision-making and support policy design (*well established*) {6.3.1.1}. Types of policies that have influence over business actions include fiscal policies (such as subsidies and taxes), land use or marine spatial planning and zoning, permitting for business activities with biodiversity criteria (including environmental impact assessments, strategic environmental assessments and National Biodiversity Strategies and Action Plans), public procurement policy, controls on advertising, the creation of standards to prevent greenwashing, the development of voluntary standards, and rules on corporate governance and disclosure (*well established*) {5.3.1, 6.3.1}. Since business activity extends beyond national borders via international value chains and global trade, regional- and international-scale policies and regulations may also be necessary (*well established*) {6.2.1}.

Governments can also promote beneficial outcomes for biodiversity and Indigenous Peoples and local communities through access and benefit-sharing arrangements (for example under the Nagoya Protocol) (*well established*) {6.3.1.5}. Patent-protected products based on biochemical substances from plants used for traditional medicine have historically generated significant revenue in the pharmaceutical and natural product industries but have not typically resulted in revenues for Indigenous Peoples and local communities who are stewards of the knowledge associated with these genetic resources (*established but incomplete*) {6.3.1.5}.

Many current policies, for example subsidies for environmentally harmful activities, cause negative impacts on biodiversity (*well established*) {5.3.2, 6.2, 6.3.1}. Businesses often lobby to keep them in place. Responsible engagement by businesses individually and collectively for ambitious biodiversity policies can help drive systems change, whereas lobbying against such changes to public policy can perpetuate business-as-usual. Public disclosure of lobbying activities is crucial for maintaining trust in the integrity of businesses (*established but incomplete*) {5.7.2, 5.7.3, 5.7.4}. Regulatory coherence across ministries and at all levels of governance is needed if harmful incentives are to be removed and biodiversity is to be addressed in sectoral policies (*well established*) {6.4.3}.

[16] Including civil society, Indigenous Peoples and local communities, consumers, non-governmental organizations, international organizations and academia.

Public disclosure of business impacts and dependencies can drive greater transparency, build trust and help governments and financial actors to enforce current laws and regulations (*established but incomplete*) {5.7.4, 6.3.1.4}. Governments and financial actors can develop consistent risk assessment frameworks and standardized reporting and promote or mandate disclosure requirements for biodiversity-related impacts, dependencies, risks and opportunities (*well established*) {6.3.1}. The worldviews and approaches to materiality that underpin reporting and disclosure standards have implications for how businesses are held accountable. Integrating diverse social values can make standards more effective (*well established*) {4.6, 5.2.2, 6.3.1, 6.3.3}. Voluntary policies and business-led guidance and initiatives, for example financing principles and policies set by trade associations and commodity roundtables, can supplement formal rules and help create a level playing field across geographies, sectors and value chains (*well established*) {5.4, 5.7.2, 5.7.3, 6.3.1}.

B3. Effective economic and financial instruments can create incentives for businesses to consider risks, opportunities, costs and benefits of their impacts and dependencies on biodiversity (*well established*).

Financial and economic instruments can help align returns for businesses with positive outcomes for biodiversity and society (*established but incomplete*) {5.3.1, 6.1, 6.2, 6.3.2}. Alignment requires eliminating, phasing out or reforming financial incentives underlying biodiversity loss and scaling up positive incentives for the conservation, restoration and sustainable use of biodiversity (*well established*) {6.3.2, 5.3.2}. Governments, central banks and financial supervisors, public development banks and international finance institutions can encourage financial institutions to allocate financial services (loans, investments, insurance policies) in ways that incentivise conservation and sustainable practices while discouraging harmful activities (*well established*) {6.3.2, 5.6.4}.

Governments can promote action through economic instruments such as taxes, subsidies, payments for ecosystem services, environmental markets and multilateral benefit sharing mechanisms, such as the Cali Fund (*well established*) {6.3.1, 6.3.2}. Governments can reform fiscal policies by eliminating, phasing out or reforming harmful subsidies and fostering positive incentives (*well established*) {6.3.2}. Public funding can be allocated to research and monitoring of biodiversity and nature's contributions to people, as well as education and capacity-building, and targeted actions for nature-based solutions, and/or ecosystem based approaches and conservation, restoration and sustainable use of biodiversity (*well established*) {6.3.2}.

Governments can encourage, and financial institutions can implement, innovative instruments like green bonds, payments for ecosystem services, high integrity biodiversity credits systems, conservation funds and sustainability-linked loans to finance biodiversity projects, where appropriate (*well established*) {6.3.2, 5.6.4}. Central banks and supervisors have a role in driving transparency through biodiversity-inclusive financial regulations and risk management (*established but incomplete*) {6.3.2}. Public development banks can promote investments in restoration projects through blended finance, while international financial institutions can provide technical assistance and conditional funding (*established but incomplete*) {6.3.2}. Individually and collaboratively, financial institutions play a pivotal role to mobilise finance and reform global and national financial systems to enable businesses to take transformative actions (*established but incomplete*) {6.3.2, 5.6.4}.

Existing financial structures often disadvantage Indigenous Peoples and local communities, creating economic and social disparities (*established but incomplete*) {6.3.2.3}. Businesses can advocate for inclusive policies and breaking down financial barriers essential for promoting economic equity (*established but incomplete*) {6.3.2.3}. Furthermore, businesses can embrace new economic models that align with the values of Indigenous Peoples and local communities (*established but incomplete*) {6.3.2.3}.

B4. Social values and norms that shape consumer preferences and determine acceptable business behaviour can help drive transformative change (*well established*).

Social values, norms, and culture help to determine acceptable business behaviours and play an important role in fostering transformative change (*established but incomplete*) {5.3, 6.1}. All actors play a vital role by fostering inclusivity and equity, ensuring that Indigenous Peoples and local communities are involved in decision-making processes that respect free, prior and informed consent (*established but incomplete*) {5.2.2, 6.1, 6.2, 6.3.3}. Governments can promote ethical practices by regulating sustainability reporting, establishing standards, supporting compliance with access and benefit sharing arrangements, and providing incentives for businesses to adopt sustainable practices (*established but incomplete*) {5.3.1, 6.3.1, 6.3.3}.

Civil society can promote shifts in social values and consumer behaviour through education and awareness, advocacy, accountability and collaboration (*established but incomplete*) {6.2}. Advocacy campaigns can raise awareness, foster sustainable consumption habits and encourage businesses to align operations with biodiversity goals (*established but incomplete*) {6.3.3.2}. By facilitating partnerships, civil society ensures that environmental and societal needs are considered (*established but incomplete*) {6.3.3.1}. Civil society and non-governmental organizations can increase transparency and accountability (*established but incomplete*) {6.3.1}. Civil society also plays a key role in developing effective monitoring strategies and verification systems (*established but incomplete*) {6.3.4.1}. For example, campaigns can support widespread responsible business, lending and investing practices by pressuring financial institutions to improve their engagement strategies and avoid financing harmful activities (*established but incomplete*) {6.3.1, 6.3.3}. Businesses can use social signalling to influence consumer choices and social norms (*established but incomplete*) {5.4.4}. All actors have a role to play in promoting sufficiency and shifting away from unsustainable consumption patterns towards sustainable lifestyles and business models (*established but incomplete*) {5.6.1}.

In many countries, there are currently insufficient mechanisms for Indigenous Peoples and local communities to overcome unequal power structures, engage in policy advocacy and fairly participate in business activities to ensure that businesses follow the communities' procedures of collective governance (*established but incomplete*) {5.3.2, 6.2, 6.3.3}. Businesses that depend on or impact biodiversity within the territories of Indigenous Peoples and local communities can adopt policies that guarantee their decision-making processes are inclusive (*established but incomplete*) {5.6.1, 5.6.2, 6.3.3.1, 6.4.7}. Such mechanisms would allow Indigenous Peoples and local communities concerns related to potential business impacts and dependencies to be incorporated into business targets and strategies (*established but incomplete*) {2.7.2, 5.6.1, 6.3.3.1}.

All stakeholders, including businesses, can benefit from aligning their operations with social values, norms, and culture by respecting cultural traditions and emphasizing stewardship of biodiversity (*established but incomplete*) {5.3.1, 6.3.3}. Engaging with Indigenous Peoples and local communities allows businesses to interweave Indigenous and local knowledge into their operations, fostering mutual respect and supporting positive outcomes (*established but incomplete*) {6.3.3}. Partnerships with Indigenous Peoples and local communities can emphasize the relational values of nature and highlight the long-term impacts of current management decisions (*established but incomplete*) {5.7.3, 6.3.3.1}.

B5. The generation, use and sharing of data and leveraging technology can create new opportunities for businesses to act (*well established*).

Governments can conduct biodiversity monitoring, collect and provide access to robust biodiversity data, including by leveraging multiple available technologies such as earth observation and artificial intelligence, noting methodological caveats associated with these technologies (*established but incomplete*) {1.5.4, 5.3.2, 6.3.4.1}. Governments can also facilitate biodiversity monitoring and intelligence systems within the legal frameworks in which they operate, for example New South Wales, Australia's biodiversity forecasting toolkit or Malaysia's biodiversity information system (*well established*) {5.6.2, 6.3.4.3}. Leveraging technology and sharing data by governments can support the implementation of multilateral agreements, for example the Convention on Biological Diversity. (*well established*) {6.3.1}.

Governments, businesses, financial institutions and other actors, for example academia and non-governmental organizations, can collaborate to develop trusted and streamlined data governance and infrastructure that enable data sharing across value chains and with financial institutions. In this context, businesses can play a catalytic role by making biodiversity data and tools publicly accessible as shared resources, including through pre-competitive collaboration on technology and data (*established but incomplete*) {5.7.2, 5.7.3, 6.1}. Businesses and financial institutions can generate, use and share data and leverage technology that support impact assessments, and generate and use models that integrate biodiversity and nature's contributions to people into economic and financial approaches (*established but incomplete*) {5.6.4, 5.7, 6.3.4.4}. Standard-setting bodies can use data and technology to promote transparency and consistency across sectors and countries by guiding businesses to disclose biodiversity impacts, for example by developing comparable accounting methods and disclosure frameworks that reflect different ecological and regional contexts and go beyond profit and financial materiality (*established but incomplete*) {5.4, 5.7.3, 6.3.4.2}. Civil society can drive transparency through biodiversity monitoring and reporting. Campaigns and collaborations can raise awareness and combat misinformation while promoting responsible biodiversity practices through accessible data resources (*established but incomplete*) {6.3.4.1}. There are examples of tools, initiatives and

experience being used now to implement many of these approaches (*well established*) {1.4.1, 5.6, 5.7, 6.3}.

Indigenous Peoples and local communities' deep-rooted knowledge of local ecosystems together with the development of modern data collection and analysis tools can enable a dynamic system for monitoring biodiversity (*established but incomplete*) {6.2, 6.3.4.1}. Access to technology can also help Indigenous Peoples and local communities monitor environmental changes and conduct environmental impact assessments of business activities on their territories and participate in the analysis of risks and opportunities and support greater accountability through the assertion of their rights and claims (*established but incomplete*) {6.2.2, 6.3.1, 6.3.2, 6.3.3, 6.3.4}. Civil society plays an important role in generating data, knowledge and capacity, for example through citizen-based approaches, in some countries recognized as citizen science (*well established*) {1.5.5 6.2.2.4}.

B6. Enhanced capacity and knowledge across actors can support measurement of impacts and dependencies by businesses and guide business actions (*well established*).

Governments and businesses can play a pivotal role to facilitate capacity-building (education, training programs and public awareness campaigns) tailored to specific audiences and geographic contexts. They can also stimulate access to measurement tools and facilitate open-source and location-specific data on biodiversity (*well established*) {6.3.5.1}.

Civil society and academic institutions can enhance capacity by fostering education and can provide diverse perspectives to bridge the gap between businesses, governments, and various groups such as youth and Indigenous Peoples and local communities to ensure mutual understanding and engagement (*established but incomplete*) {6.3.5.1, 6.3.5.2}. Public awareness campaigns aimed at consumers can provide information to support sustainable patterns of consumption (*established but incomplete*) {6.3.3}.

Financial actors and financial institutions can complement capacity-building efforts through technical assistance programs, risk mitigation tools and fiscal instruments (*established but incomplete*) {6.3.5.1}. In addition, public development banks could lead by example, supporting strategies and planning initiatives that mainstream biodiversity considerations into financial policies and investments, effectively building the capacity of financial institutions and businesses to act sustainably (*well established*) {6.3.5.1}.

Education and capacity-building programmes for businesses, communities and civil society can be tailored to the needs, realities and knowledge systems of Indigenous Peoples and local communities (*well established*) {6.3.5.3}. Establishing such programmes can raise awareness about Indigenous and local knowledge and empower individuals and communities to engage in decision-making processes related to business activities (*well established*) {6.3.5.3}. Indigenous Peoples and local communities are vital actors on intercultural competencies, and businesses can benefit from involving these communities in their training programmes (*well established*) {6.3.5.2}.

B7. All businesses have a responsibility to act and can take further actions within an enabling environment (*well established*).

Transformative change requires action by all businesses (*well established*) {1.1.2, 5.1, 6.1.2, 6.1.4}. Responsibility of individual businesses to act can be determined with reference to globally agreed goals, national contexts (including policies, laws and regulations) and the impacts and dependencies of business on biodiversity. Globally agreed goals, such as Target 15 of the Kunming-Montreal Global Biodiversity Framework, include specific requirements for large and transnational businesses and financial institutions to act. This reflects that] responsibility is not evenly shared among businesses (*established but incomplete*) {5.2.2}. However, the current level of business action is insufficient for transformative change, in part because the enabling environment is missing (*well established*) {5.1, 6.1.5}. An effective enabling environment would set clear expectations about who must act, where action is required, in which locations and which biodiversity outcomes need to be achieved {1.5, 6.3}. While these conditions are not yet fully in place, some businesses are taking incremental action, motivated by a range of factors (*well established*) {5.1, 5.5, 5.6}.

Business motivations to act include intrinsic factors, such as moral norms in their internal culture and leadership, and instrumental factors, such as attracting and retaining their workforce and the internal imperative to respond to their biodiversity-related risks and opportunities (*established but incomplete*) {5.3.1}. Whether such motivations exist depends on the socio-ecological context in which businesses operate (*well established*) {2.2.3, 2.2.4, 5.3}. Minor changes in context, such as changes in the cost of

raw materials, the regulatory regime, the state of biodiversity or in the availability of access to information, can change the motivations for business actions (*established but incomplete*) {5.3.1}. Transformative change under an appropriate enabling environment would align profitable business actions with what is good for biodiversity and society (*well established*) {1.5, 6.1.2, 6.1.3}. Creating this enabling environment would result in businesses and financial institutions being positive agents of change in transforming to a just and sustainable economic system (*well established*) {1.5, 5.3.2, 6.1.4}.

B8. Businesses can take actions to address their impacts and dependencies, contribute to an enabling environment and influence others (*well established*).

Actions are needed by all businesses, including private financial institutions. Priorities differ depending on a business's size, sector, structure and relationship with biodiversity, location where outcomes can be achieved most effectively, and their degree of control and influence over stakeholders (*established by incomplete*) {5.2, 5.6, 5.7}. Signalling to inspire others requires businesses to provide robust, transparent and credible reporting of actions and outcomes (*well established*) {5.7.4}.

Actions of each type can be pursued across the four decision-making levels at which biodiversity impacts and dependencies are measured: corporate, operations, value chain and portfolio (*well established*) {5.5, 5.6, 5.7}. Close links exist between actions implemented across decision-making levels. For example, targets set at the corporate level drive actions and outcomes at the operations and value chain levels (*well established*) {5.6, 5.7}. Across all decision-making levels, actions can be taken individually or collectively, including through partnerships (e.g., public-private partnerships) (*established but incomplete*) {5.7.2, 5.7.3} (**Figure SPM.5**).

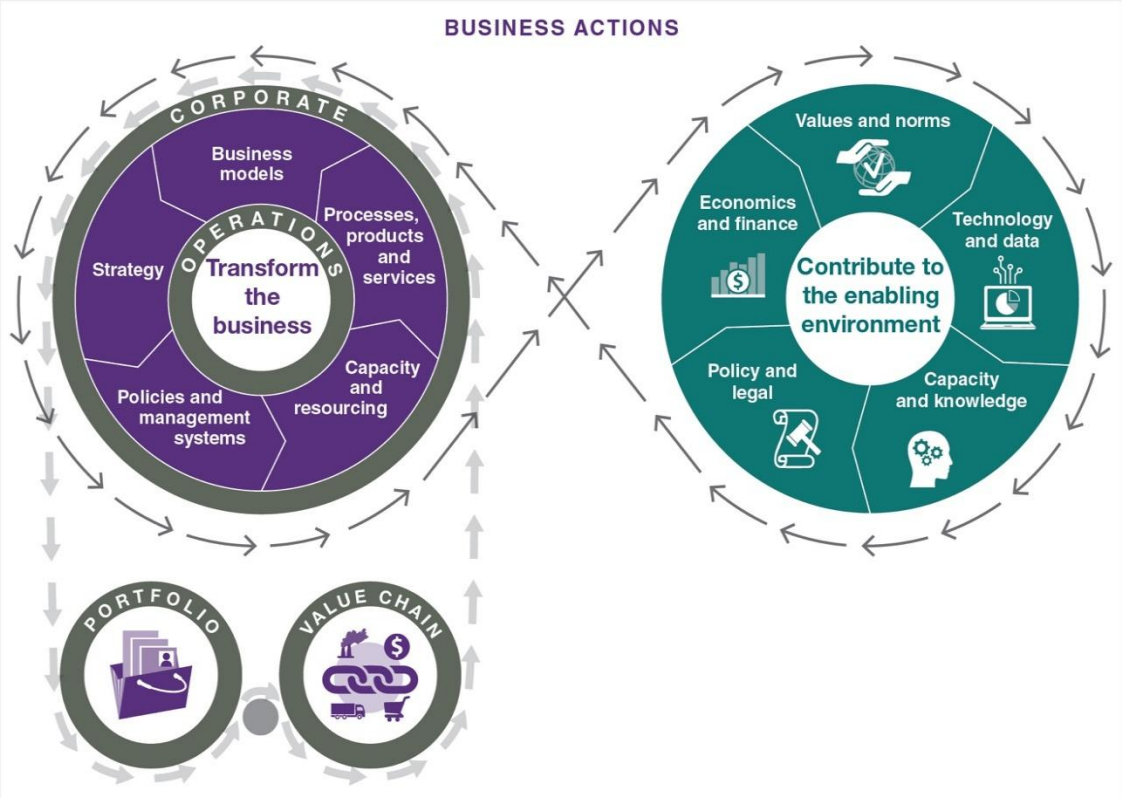


Figure SPM.5 Business actions to address their impacts and dependencies, and to contribute to creating an enabling environment. At the corporate level, businesses can set strategy, design policies and management systems, allocate capacity and resources, innovate processes, products and services, and explore alternative business models. These can facilitate actions at operations, value chain and portfolio levels and can contribute to creating an enabling environment. Business actions and the enabling environment continue to influence each other.

B9. Corporate-level action sets direction, aligns governance and resources with ambition, and enables implementation and outcomes across operations and value chains (*well established*).

Businesses can establish ambitious, outcome-oriented biodiversity commitments and targets, and integrate these into corporate strategy (*well established*) {5.6.1}. Biodiversity targets are more effective when their development and implementation take into consideration a business's impacts and dependencies on biodiversity and nature's contributions to people, and when aligned with national and global biodiversity objectives (including the three objectives of the Convention on Biological Diversity and the 2050 Vision for Biodiversity) (*established but incomplete*) {2.8, 5.6.1}. Businesses can also create and revise internal policies and standards, including on procurement, incentives, investment, access and benefit sharing, product and service design and use, marketing, stakeholder engagement and grievance mechanisms, together with management systems for biodiversity measurement, monitoring, reporting and disclosure. Policies can support corporate accountability more effectively when they are paired with accounting frameworks that integrate biodiversity, alongside standardised disclosure mechanisms for businesses to report their impacts, dependencies, risks and opportunities (*established but incomplete*) {4.6.1, 5.6.1, 5.7}. Effective delivery requires shifts in corporate governance and resourcing – which have typically prioritised financial returns and profit maximisation for shareholders – toward purpose-oriented models that broaden accountability to other stakeholders. These shifts depend on aligning shareholder and societal interests, providing appropriate incentives for directors and managers, and adequate resource allocation (*established but incomplete*) {5.6.1}. The adoption of innovations and new technologies that address impacts and dependencies by businesses – in products, processes and services – can improve outcomes for biodiversity across operations and value chains. Examples include circular economy approaches focused on product durability and extension of product life spans (*well established*) {5.6.1}. Additionally, businesses can adopt policies to facilitate investment in biodiversity beyond their operations and value chains, including through high integrity biodiversity credits. Finally, businesses can explore alternative business models aligned with global biodiversity goals and targets, and contributing to a just and sustainable future. This can be done, for example, by shifting ownership to non-investor stakeholders, changing governance rights and decision-making power, or adopting legal forms that establish accountability to stakeholders (*established but incomplete*) {5.6.1}.

Corporate-level actions can benefit from being informed by data generated through the measurement of biodiversity and nature's contributions to people (*established but incomplete*) {4.6.1, 5.6.1}. While this information can guide and improve outcomes, many corporate-level actions can also be implemented immediately, despite incomplete data, especially when designed and implemented through meaningful engagement with internal and external stakeholders (*established but incomplete*) {5.5, 5.6.1}. Such engagement supports knowledge acquisition, democratic environmental governance and improved corporate legitimacy. Engagement can build staff capacity and board-level environmental leadership, gather diverse perspectives on biodiversity values and actions, and provide input on strategy, target setting, and assessment of impacts and dependencies. It can also establish requirements and commitments on auditing, monitoring and performance assessment (*established but incomplete*) {2.8, 4.6.1, 5.5, 5.6.1}.

B10. Improving transparency, traceability and collaborative action in the value chain can help businesses address impacts and dependencies (*well established*).

For many businesses, especially those that rely on raw materials, significant impacts and dependencies on biodiversity and nature's contributions to people accrue across value chains (*well established*) {2.2.3, 3.2.2}. Businesses can adopt approaches that emphasise integration across value chains and collaborate with suppliers and customers (*established but incomplete*) {5.6.3}. Businesses can start by mapping value chains (actors and inputs) and improving traceability by linking products and materials to specific suppliers, locations and impacts. Doing so can help identify risks and prioritise actions noting that mapping beyond direct suppliers often remains challenging (*established but incomplete*) {5.6.3}. Examples at the corporate and value chain levels exist, such as companies in the chocolate industry that have made advances in recording biodiversity dependencies to improve business decisions through full traceability of materials and improved supplier control mechanisms (*established but incomplete*) {5.6.3}.

Once mapped, businesses can communicate expectations for suppliers, monitor performance and exercise due diligence, including addressing non-compliance (*established but incomplete*) {5.6.3}. Approaches that incentivise environmental performance and build long-term relationships and supplier

capacity through training, knowledge exchange and innovation are often effective at improving outcomes and can be particularly critical for small businesses with limited resources (*established but incomplete*) {5.6.3, 5.7.3}. Effective value-chain management requires businesses to go beyond procurement requirements, data collection and due diligence, and to engage in close, sustained collaboration and capacity building with suppliers. This may include Indigenous Peoples and local communities, smallholder producers, and small and medium-sized enterprises, which often face limited institutional capacity and resources. Integrating communities into value-creation activities such as sourcing, production and distribution has been identified as a success factor in sustainable value-chain management (*established but incomplete*) {5.6.3}. Consumer-facing strategies such as product labelling, education, incentives and post-purchase engagement can shape behaviour and improve transparency, but their effectiveness is constrained by consumer scepticism, certification costs and business models reliant on unsustainable consumption (*established but incomplete*) {5.6.3, 5.7).

B11. Businesses can act at the operations level to address impacts and dependencies of their activities (*well established*).

Businesses can use robust environmental and social impact assessments and management plans at ecologically meaningful scales to inform decisions on where to locate and how to manage operations. These assessments can be supported by credible monitoring of both actions and biodiversity outcomes within an adaptive management cycle (*well established*) {4.4, 5.6.2}. To deliver lasting outcomes on the ground, businesses can apply the mitigation hierarchy first avoiding harm to biodiversity, then minimising harm, restoring biodiversity, and offsetting residual impacts to achieve 'no net loss' and preferably achieving a net gain in biodiversity and nature's contributions to people. Later-stage measures such as restoration and offsetting are typically more costly, uncertain, and less effective at returning biodiversity to baseline conditions, reinforcing the need to prioritise early-stage avoidance and minimisation (*well established*) {5.6.2}. Although the mitigation hierarchy is recognised as leading practice, adoption remains incomplete, in part because many business activities and impacts fall outside regulatory requirements (*well established*) {5.6.2}. Very few operations have achieved 'no net loss' or shown that they have the capacity to do so (*well established*) {5.6.2}. Monitoring requires sector-specific metrics linked to targets, yet reporting often lacks data for independent verification (*well established*) {5.6.2}. Analyses should also consider displacement (or leakage) of impacts where actions at one operation shift pressures on biodiversity elsewhere (*well established*) {5.6.2}. Additionally, opportunities exist for businesses at operations level to go beyond impact mitigation to engage in landscape conservation, restoration and sustainable management (*established but incomplete*) {5.5, 5.7.1, 5.7.2}.

Meaningful engagement of stakeholders and Indigenous Peoples and local communities, prior to the start, throughout and after the closure of business activities, is essential to build trust, align actions with local and national priorities and recognise applicable rights (*well established*) {5.6.2.4}. For example, when establishing or significantly changing their activities, businesses should recognise and respect the free, prior and informed consent of Indigenous Peoples and local communities, along with their respective rights in accordance with national legislation.

Indigenous and local knowledge can inform baselines and monitoring, recognise the multiple values of nature, and improve the design of mitigation measures and business practices with long-term socio-economic and environmental benefits. However, such integration remains rare in practice (*established but incomplete*) {2.7.2, 3.3.1, 4.6.2, 5.6.2}.

B12. Financial institutions can shift finance away from harmful activities and towards business activities with positive impacts on biodiversity (*well established*).

In addition to actions that apply to all businesses, financial institutions can play a pivotal role in fostering business transitions to align with biodiversity goals. The actions and their influence on biodiversity outcomes vary across financial institutions (lenders, investors, insurers), but all have a role in redirecting finance flows to support biodiversity outcomes. Through 'financing green' and 'greening financing' approaches, financial institutions can, respectively, shift capital flows towards business activities with positive impacts and away from businesses with negative impacts on biodiversity and nature's contributions to people (*established but incomplete*) {5.6.4}.

Financial institutions can establish and communicate their criteria for decision-making when lending, investing and insuring businesses (*well established*) {5.6.1, 5.6.4}. Decisions based on these criteria benefit from information provided by the specific and robust measurement and disclosure of impacts, dependencies, risks and opportunities (*well established*) {4.4.1, 4.4.2, 5.6.4}.

Financial institutions can influence actions across their entire portfolio through capital allocation and stewardship strategies by engaging with clients to align practices with biodiversity targets, exercising voting rights, and excluding or divesting from harmful activities (*well established*) {4.1.2, 4.4.15.6.4}. Recognising the need to support businesses' activities, financial institutions can also engage with businesses to foster actions that improve performance or support the transition of their activities. This is particularly true for places and activities where upfront investments are high and risks are substantial, such as small- and medium-sized enterprises working towards biodiversity conservation and sustainable use (*well established*) {6.4.3}.

In addition to shifting financial flows away from negative activities, financial institutions can deploy instruments and strategies, such as blended finance, impact investing and green or sustainability-linked bonds to provide capital to businesses engaged in conserving, restoring or sustainably using biodiversity. Financial institutions can also make contributions to initiatives such as the Global Biodiversity Framework Fund (*established but incomplete*) {5.6.4.5, 5.6.4.6, 5.6.4.7}.

B13. Barriers to businesses and others undertaking action persist, with considerable variation across national and sectoral contexts (*well established*).

Barriers to action exist across all groups of actors (**Table SPM.4**). These barriers do not affect all actors equally and may disproportionately affect small and medium-sized businesses and financial institutions in developing countries (*well established*) {5.3.2, 5.4, 5.6}. Action is limited by systemic barriers such as profit-driven business models and economic systems that measure progress in gross domestic product, weak policy incentives, limited access to financial resources and data or knowledge gaps (including the lack of quantitative and comparable measurements of business impacts) (*well established*) {3.6.3, 5.3.2}. Business-led initiatives have emerged to address some of these barriers but tend to focus on large companies and may emphasise disclosure over the need to deliver tangible biodiversity outcomes. Unclear and uncertain expectations from consumers, investors and governments hinder consistent and credible business contributions to global biodiversity goals and targets (*well established*) {5.3.2}.

Table SPM.4 Illustrative barriers to action across components of the enabling environment.

Component of the enabling environment	Barriers to action
Policy and legal	• Weak or inconsistent biodiversity policies or political will (e.g., lack of ambition or specificity to guide business action) • Lack of regulations mandating the disclosure of biodiversity related impacts, risks and opportunities • Regulatory fragmentation across jurisdictions • Contradictory regulatory injunctions • Lack of regulations to address nature-related risks in the financial sector • Weak enforcement of rules • Undue influence of negative corporate lobbying • Corruption and illegal activity • Pressure to deliver quick results • Lack of level playing field
Economics and finance	• Short-term profit orientation and limited financial incentives to take actions with long-term outcomes • Fiduciary duty limitations - executive mandates that do not include environmental and social considerations • Perverse incentives that do not internalize impacts on biodiversity • Weak or absent penalties for causing biodiversity decline (no obligation to restore/recover/reverse damage caused) • Limited financial resources for investments to improve outcomes for biodiversity, especially for small and medium enterprises • Weak capacity to assess the stock and flow of natural capital and to assess the various values (including economic) of ecosystem services • Failure to take negative externalities into account
Values and norms	• Conflicting priorities of groups in civil society • Weak societal pressure on businesses to provide positive actions for biodiversity or reduce harm to biodiversity • Unclear expectations of business from consumers, investors and governments • Entrenched organizational culture and fragmented accountability for biodiversity within businesses • Limited custodianship and recognition of the rights of Indigenous Peoples and local communities • Power imbalances limit or compromise the potential for cooperation among multiple actors
Technology and data	• Lack of access to technology, data, models and scenarios, knowledge regarding their use and incentives and regulation to increase their uptake • Poor data quality • Inconsistent metrics and proliferation of guidance that create confusion • Weak data tracking systems within businesses • Lack of accessibility to scientific information • Missing methods for businesses to disaggregate global biodiversity goals, at a resolution that is sufficient to support effective decision making to enable businesses to act.
Capacity and knowledge	• Limited awareness about impacts and dependencies of businesses on biodiversity (e.g., investor knowledge gaps) • Limited capacity, knowledge and skills for taking effective action • Low uptake of tools by businesses • Lack of visibility and transparency in the operations of businesses and across value chains • Limited information about links between business actions and biodiversity outcomes

Traceablity: {1.1.2, 1.3, 1.5.2, 2.5.5, 4.5.3, 5.2.2, 5.3.1, 5.3.2, 5.4, 5.6, 6.3, 6.4}

C. Measuring businesses impacts and dependencies on biodiversity and nature's contributions to people.

C1. Many different methods and metrics are available, and this diversity is needed to measure the impacts and dependencies of businesses on biodiversity and nature's contributions to people (*well established*).

Different aspects of biodiversity and nature's contributions to people require different metrics and methods of measurement; no single metric or method can be used to measure all impacts and dependencies across all sectors and locations (*well established*) {2.3, 2.4, 3.3, 4.1, 4.2, 4.4}. Methods vary in their ability to capture impacts and dependencies by location, within sectors and across the value chain, as well as cumulative impacts **(Table SPM.5)** (*well established*) {2.3, 2.4, 3.3}. Methods can be grouped into categories of macro-scale environmental economic models, life cycle approaches, spatial analysis, participatory mapping and monitoring, and location-based observations (*well established*) {2.3, 3.3, 4.2}. These approaches use different types of metrics of impacts and dependencies, including metrics of condition and significance of a location for biodiversity (for both species and ecosystems) and metrics on potential and actual flow of nature's contributions to people and human wellbeing, reflecting different values of nature (*well established*) {3.3, 4.2}. Monetary and quantitative and qualitative non-monetary valuation methods (including socio-cultural valuation) can be applied to understand the consequences of impacts and dependencies for aspects of human wellbeing (*well established*) {2.3.4, 2.3.5, 3.3, 4.6.1}. Methods are frequently used in combination to improve accuracy or extend coverage of measurement (*well established*) {2.4.1, 3.3, 4.2.3}. The choice of methods and the metrics used has implications for representing the diverse values of nature (*well established*) {2.3, 2.4, 3.3, 4.3.2, 4.6}.

Methods need to be selected carefully, ensuring their fitness for the individual business purpose for which they are being applied (*established but incomplete*) {4.2; 4.4}. Fitness for purpose depends on coverage, accuracy and responsiveness (*well established*) {2.3, 2.4, 3.3, 4.4}.

Coverage of a method refers both to its geographic coverage and to the extent to which it includes impacts and dependencies on biodiversity and nature's contributions to people (*established but incomplete*) {4.2.1}. To be considered fit for purpose, a method needs to cover all relevant pressure types, impacts and dependencies of a business on biodiversity and nature's contributions to people at relevant geographic and temporal scales (*established but incomplete*) {4.2.1}.

Accuracy is the degree to which results correctly describe what they are designed to measure (*established but incomplete*) {4.2.1}. The accuracy necessary for a method to be considered fit for purpose varies by application (*established but incomplete*) {4.2.1}. Many business decisions do not require highly accurate results, provided they are directionally correct (*well established*) {4.4}. For example, if a method provides adequate information on the relative biodiversity impacts of two materials, it can enable a decision on the choice of one raw material over another. Methods based on modelling approaches (multi-regional input-output modelling, life cycle approaches or spatial modelling) can sometimes provide a false sense of accuracy not supported by the level of detail of the underlying data or models; these shortcomings can be addressed by the use of data generated from bottom-up methods (location-based observations, participatory monitoring and mapping) (*well established*) {4.4}. Decision makers would benefit from understanding the limitations of the results of different methods to avoid ill-informed or incorrect decisions (*well established*) {4.4}. Guidelines and capacity-building could help businesses to correctly interpret results from different methods and thereby ensure that they adequately inform action (*established but incomplete*) {4.5}.

Responsiveness refers to the ability of a method to link business actions and activities to changes in biodiversity or nature's contributions to people (*well established*) {4.2}. Responsiveness is particularly important for tracking change in pressures as part of an impact assessment, or reliance on biodiversity as part of a dependency assessment, and for detecting changes over time in response to business activities or actions (*well established*) {4.4}. Attribution of observed changes in biodiversity or nature's contributions to people to business activities should use baselines and counterfactuals and account for time lags, indirect effects and variation in background conditions (*well established*) {4.2, 4.4, 5.2.1}.

Method categories	Example of dependency assessment {Table 2.2}	Example of impact assessment {Table 3.1}
Location-based observations	Primary data from smallholder farms in South America was used to assess how natural pollination affects coffee fruit set.	Satellite imagery used to quantify the direct and indirect impacts of industrial mines on deforestation across the global tropics
	Small-scale farmers and fisherfolks use visual surveys to gauge species richness, evenness, and relative dominance.	Field sampling used to measure the abundance and diversity of birds, plants, insects and spiders across crop fields of varying sizes in North America
Participatory monitoring and mapping	Local fishing communities in West Africa, as key Indigenous People and local communities stakeholders, collaborated with researchers to map and assess fisheries, revealing how artisanal fishing businesses depend on healthy coastal and mangrove habitats.	Participatory mapping identified potential impacts of offshore wind farms to local fisheries and marine biodiversity in South America.
	In South-East Asia, Indigeneous People and local communities and a mariculture enterprise co-mapped essential marine nature's contributions to people, to demonstrate their shared reliance on healthy reefs and mangroves, guiding more inclusive and sustainable resource management.	Community monitors and scientists collaborated to assess water pollution and its impacts downstream of a coal mine in Southern Africa.
Spatial analysis	The acreage of medicinal plant resources in North-East Asia was identified and classified to illustrate industry dependence on specific plant habitats and ecosystem productivity.	Different potential power line routes overlaid with environmental and social data layers to measure the routes' impacts on ecologically sensitive and socially complex areas in Southern Africa.
	Machine-learning models project shifting areas for grape cultivation in Central and Western Europe, highlighting the wine sector's reliance on biodiversity-driven climatic and soil conditions.	Global modelling of nature's contributions to people and biodiversity combined with asset locations to quantify the direct impacts of corporate assets from over 2,000 businesses.
Life cycle approaches	Dependency of rice production systems on water provisioning, as well as dependencies on carbon sequestration, water quality, and air quality regulation in South Asia, North-East Asia and North America.	Life cycle assessment and environmentally extended multi-regional input-output models combined to estimate biodiversity impacts across a global set of 3,000 businesses.
		Life cycle assessment integrated with spatial modelling to assess the impacts of alternative feedstock sources for bioplastics from South America and North America on biodiversity and nature's contributions to people.
Macro-scale environmental-economic models	Agricultural dependency on pollination was estimated to outweigh the abatement costs of several measures to protect pollinators in Central and Western Europe.	Nested multiregional input-output (MRIO) models used to quantify the impacts of beef production on threatened animal species in Oceania through local and global supply chains.

Purpose of measurement

Screening: identifying priorities requiring further analysis or action

Comparing options: evaluating potential impacts and dependencies of business activities relative to alternatives

Tracking potential changes in impacts/dependencies: measuring change in pressures over time as part of an impact assessment, or the change in reliance of business activities on nature's contributions to people over time as part of a dependency assessment

Observing change in nature: showing positive or negative changes in biodiversity and nature's contributions to people that can be attributed or linked to the business activities or action on biodiversity

Table SPM.5 Example of applications of methods for assessing business dependencies and impacts. Socio-cultural and monetary valuation methods, integrated approaches and accounting frameworks can also support assessment of dependencies and impacts {Traceability to chapters in Table 2.2, Table 3.1, 4.6}.

C2. Methods exist to support all business decisions, and appropriate methods can be selected based on the purpose and level of the decision (*well established*).

Determining the appropriate measurement approaches for different decision contexts requires considering the four main purposes for measuring biodiversity (**Table SPM.6**) alongside the four levels of business decision-making (**Figure SPM.6**). Location-based observations (including relevant maps and remote sensing) can inform biodiversity assessments at operations levels for all business purposes, often with existing data, but may require significant data gathering to inform decisions requiring greater geographic coverage (decisions that affect value chains, corporate strategies and portfolios) (*well established*) {4.4}. As a result, decisions at these levels often rely on aggregate metrics and proxies (*well established*) {4.4}. Bottom-up methods such as location-based observations or participatory mapping and monitoring that make use of primary data collection to populate a wide set of metrics and integrate local specificities can better represent the diverse values of nature (*well established*) {4.4}. Aggregate metrics[17], that are outputs of top-down methods based on models, are not appropriate for measuring the change in biodiversity outcomes at sites, or for decisions affecting specific sites or selecting specific investments (*well established*) {4.4}.

Table SPM.6 Purposes of measurement and examples of applications.

Purpose of measurement		Examples of applications
Screening	Identifying priorities requiring further analysis or action	• Investment portfolios • Products or business lines • Types of materials or supply chains • Operational locations
Comparing options	Evaluating potential impacts and dependencies of business activities or decisions, relative to alternatives	• Portfolio manager choosing individual securities for an investment fund • Businesses choosing the types of raw materials for products or specific supplier • Businesses assessing the relative impact of proposed new acquisitions • Businesses choosing sites for operations
Tracking change in potential impacts and dependencies	Measuring change in presssures over time as part of an impact assessment, or the change in reliance of business activities on nature's contributions to people over time as part of a dependency assessment	• Asset manager tracking the change in the overall biodiversity footprint of an investment portfolio over time • Credit analyst assessing the change in the risk profile of businesses • Businesses assessing the change in their biodiversity footprint • Businesses tracking the change in the extent of potential dependencies on biodiversity and nature's contributions to people
Observing change in biodiversity	Showing positive or negative changes in biodiversity and nature's contributions to people that can be linked to business activities or action on biodiversity	• Businesses measuring changes in ecosystems at a site • Businesses measuring changes in nature's contributions to people linked to operations • Governments measuring the extent and quality of ecosystems in an agricultural landscape • Non-governmental organization measuring changes in species populations

[17] Such as "mean species abundance" or "potentially disappeared fraction of species".

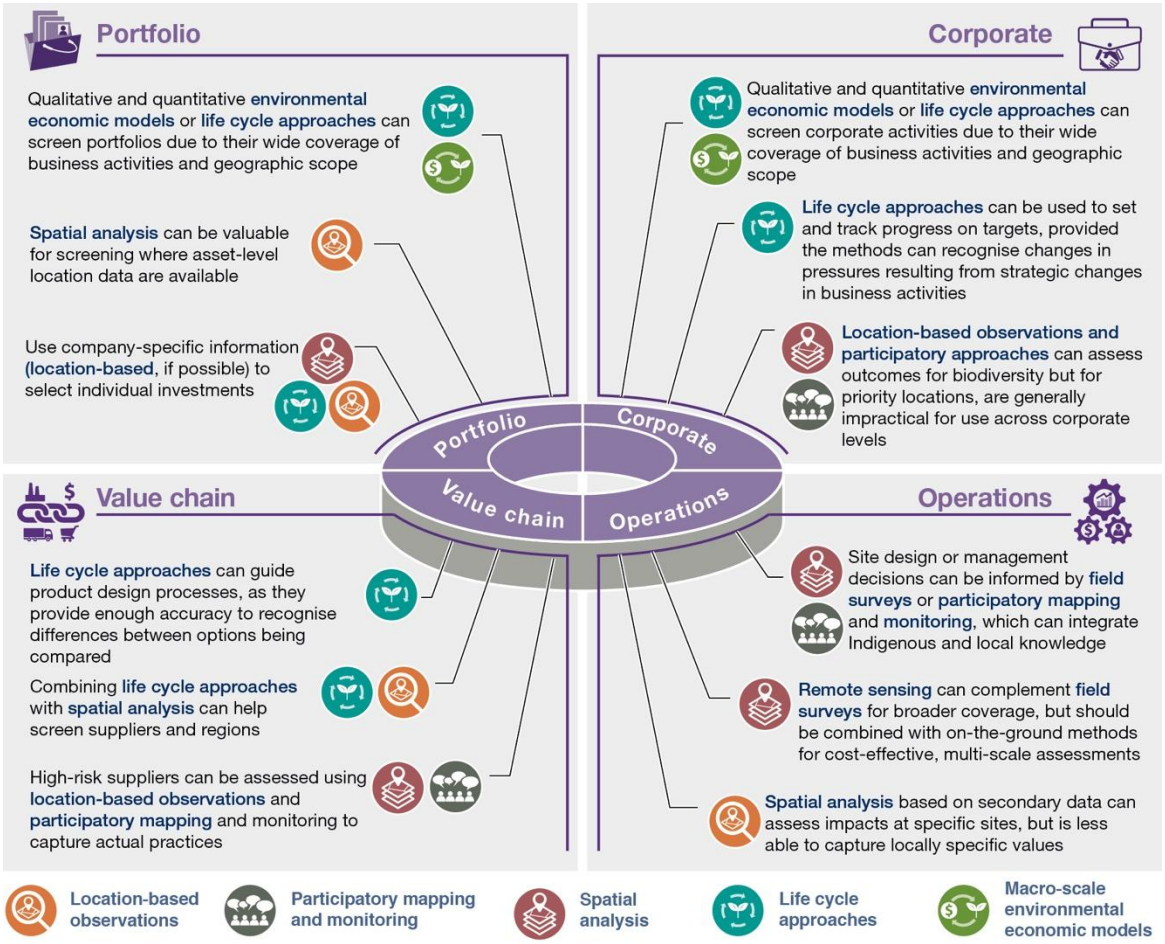


Figure SPM.6 Examples of appropriate measurement approaches at different levels of decision-making.

C3. Business uptake of impact and dependency measurements and disclosure is currently limited (*well established*).

While many methods to measure impacts and dependencies are available, a lack of necessary internal capacity or financial resources may limit the ability of businesses to apply them, with implications for equity and participation across countries and actors (*established but incomplete*) {4.5.3, 5.3.2}. Business uptake may be limited by the perceived complexity of biodiversity and nature's contributions to people, which cannot easily be measured by a single approach or metric, but that requires the combination of multiple methods and metrics (*established but incomplete*) {4.5.3}.

Less than 1 per cent of publicly reporting companies mention their impacts on biodiversity in their reports, although the number doing so is growing in response to recent reporting and disclosure standards and frameworks (*well established*) {4.5, 5.4}. Factors limiting measurement and reporting include motivational, institutional and resource-related barriers (*well established*) (**Table SPM.4**) {4.5.3}. Biodiversity impact and dependency assessments require expertise and can be costly to undertake (*established but incomplete*) {4.5.1, 5.3.2}. There are currently few incentives for businesses to measure and disclose their impacts and dependencies (*established but incomplete*) {4.5.3}. Business uptake is influenced by regulatory demands, financial factors and reputational considerations. Sectors subject to site-level regulations, such as mining, conduct more biodiversity impact assessments than other sectors (*well established*) {4.5.3}. Financial institutions report more often than other sectors, likely driven by the existing and anticipated regulatory requirements mandating disclosures related to biodiversity and climate change (*well established*) {4.5.3}. Larger uptake could also be explained by the availability of tools created specifically for the financial sector (*established but incomplete*) {4.5.3}.

High-profile dependency assessments at the portfolio level have been conducted by central banks and financial institutions in efforts to understand exposure to nature-related financial risk (*well established*) {2.5.3, 4.2.4.}. Central banks in at least eight countries and the European Union

have performed analyses on the exposure of financial institutions to dependencies on biodiversity through their financing activities (*well established*) {2.5.3}. The analyses by central banks have raised awareness in the financial sector (*well established*) {2.5.3, 4.5.3}. However, these analyses do not differentiate investments within sectors, consider the capacity of ecosystems to provide nature's contributions to people, or address change over time. To date, there has been limited uptake of the outputs of these assessments (*well established*) {2.5.3, 2.5.5, 4.5.3}. A recent survey among financial institutions representing 30 per cent of global market capitalization value finds that the three most cited barriers for uptake of nature-related risk assessment and management are: 1) access to reliable data; 2) access to reliable models; and 3) access to scenarios (*established but incomplete*) (**Table SPM.4**) {2.5.5}.

C4. Site-specific location and activity data is needed for operations and value chains to improve impact and dependency assessments (*well established*).

Because impacts and dependencies of businesses on biodiversity are site specific, information on the location of business activities, assets and sourcing locations is needed to accurately measure the impacts and dependencies of business operations and value chains (*well established*) {2.2, 2.3, 2.4, 3.2, 3.3, 4.3, 4.4, 4.5.1, 4.5.2}. While some data exist to assist operation-level decision-making, gaps exist in the availability and accessibility of these data and of information on the origin of input materials (including genetic resources) used by specific businesses, especially in value chains. These gaps are due to traceability limitations, as many resources are traded and exchanged multiple times along the value chain (*well established*) {2.3, 5.3.2, 5.6.3, 4.4.4, 5.6.2}. These knowledge gaps present a significant barrier to efforts by businesses to understand the full scale of impacts along their value chain, reducing the visibility of risks and inhibiting action to support improved practices at specific locations (*established but incomplete*) {4.4.3, 5.3.2, 5.6.3, 5.6.4.2}. To go beyond screening to measuring outcomes, information on practices (such as agricultural practices, mining methods, manufacturing techniques) at specific sites is also needed (*established but incomplete*) {4.4}. Currently, information on the location and associated management practice is not commonly collected or reported (*well established*) {4.4, 4.5}.

C5. Consistent scenario planning of impacts and dependencies on biodiversity and nature's contributions to people can be used for coherent analysis of risks and opportunities (*established but incomplete*).

Scenarios offer an opportunity for businesses to plan for potential futures and gain information about future potential risks and opportunities from changes in biodiversity and nature's contributions to people (*well established*) {3.6.2, 4.2.4}. However, uptake of scenario planning remains low at all scales (*well established*) {4.2.4}. Information on likely future trends for biodiversity and a variety of scenarios and models exist and could be used by financial institutions to take forward-looking decisions and predict future performance (*well established*) {2.2, 2.4.2, 2.5.5, 4.2.4.}. Efforts to analyse short-term scenarios for extreme events, like complete loss of nature's contributions to people, including ecosystem services, are addressed in stress testing by some central banks (*established but incomplete*) {2.5.5, 4.2.4.}. Scenarios can also be used to analyse long-term systemic risks for the whole economy resulting from biodiversity decline, including tipping points and cascading effects (*established but incomplete*) {2.4.5}.

C6. Actionable guidance for measuring business dependencies on biodiversity and nature's contributions to people is needed (*well established*).

Many methods that measure biodiversity and nature's contributions to people could be applicable to assessing business dependencies. Their uptake and inclusion in business-focused tools is limited, especially for nature's contributions to people (*well established*) {4.5, 5.3.2, 5.4}. In contrast, many tools and associated guidance applicable to business are available to assess impacts (*well established*) {3.3.2, 4.5}. Methods are available that provide high-level dependency assessments of businesses and financial portfolios based on industry average information (*well established*) {4.2.3, 4.4}. Such assessments have been applied to screen potentially material dependencies (*established but incomplete*) {4.5}. Methods and metrics that measure nature's contributions to people by location could be used for dependency analyses for operations and value chains, especially for material contributions, though methods readily available for use by businesses are lacking for many non-material and regulating contributions (*well established*) {4.2.2}. There remains a need for

approaches that can be easily applied across business operations, considering the location-specific availability and delivery of the full range of nature's contributions to people (*established but incomplete*) {4.4}.

C7. Businesses can learn from Indigenous and local knowledge and fairly and equitably share benefits with Indigenous Peoples and local communities (*established but incomplete*).

Indigenous Peoples and local communities are holders of extensive knowledge on biodiversity, its values, conservation, restoration and sustainable use (*well established*) {2.3.3, 2.3.7.1, 4.3.1}. There are examples of partnerships between businesses and Indigenous Peoples and local communities to develop new products and services that document and preserve Indigenous and local knowledge, share benefits fairly and equitably, respect the rights of Indigenous Peoples and local communities, in accordance with national legislation (*well established*) {2.7.2}. However, these have often not been recognized by profit-driven businesses (*established but incomplete*) {2.3.3, 2.7.1, 3.3.3, 4.3.1}. Approaches for measuring business impacts on biodiversity and nature's contributions to people generally do not adequately measure impacts on Indigenous Peoples and local communities, nor interweave business knowledge with Indigenous and local knowledge (*established but incomplete*) {3.3.3, 4.3.1}. Most approaches are based on anthropocentric worldviews and instrumental values, rather than biocentric or pluricentric worldviews, which influences the interpretation of business impacts and dependencies (*well established*) {4.3.2}. To improve engagement with Indigenous Peoples and local communities, businesses should recognise and respect the free, prior and informed consent of Indigenous Peoples and local communities, along with their respective rights in accordance with national legislation (*established but incomplete*) {2.3.3, 2.7.1, 4.3.1, 5.2.2}. Businesses can improve their approaches by learning from businesses of Indigenous Peoples and local communities that have business models with clear social and ecological benefits, and ways of working that respect reciprocal people-nature relationships {2.7.2, 4.3.1, 5.7.3}. Collaboration between academia and Indigenous Peoples and local communities can help interweave Indigenous and local knowledge, where appropriate. While this is occurring in some places it rarely informs business assessments (*established but incomplete*) {4.3.1, 5.7.3}.

C8. Filling gaps in knowledge and its application can make measurement of business impacts and dependencies on biodiversity more robust and decision-relevant (*well established*).

Knowledge gaps for measuring business impacts and dependencies can be identified across five broad areas: a) business-relevant data; b) data accessibility and transparency; c) completeness of evidence; d) adoption of methods; and e) applicability of methods (**Table SPM.7**). Addressing each of these knowledge gaps would significantly improve applicability by businesses and improve business accountability. A core set of gaps in knowledge and practice exist related to the needs and shortcomings in data, uptake and methods identified here, including low adoption of methods in business action (C3), gaps in business location and activity data (C4), lack of consistent scenarios for biodiversity (C5), lack of actionable guidance for measuring dependencies (C6), and insufficient interweaving of Indigenous and local knowledge (C7). Addressing these knowledge gaps will require coordinated public and private investment. Furthermore, a balance between the scientific rigor of measurements and the affordability and applicability of methods by businesses is also required to effectively support business actions. Closing these knowledge gaps would allow methods to be applied to a wider set of decision contexts, increase consistency when comparing across businesses, portfolios and countries, and enable further action by businesses and financial institutions (**Table SPM.2**).

Table SPM.7 Gaps in knowledge and its application

Gaps in knowledge	Description
1. Inadequate data Gaps characterised by the lack of data and non-standardized data on specific topics or meeting specific criteria.	Lack of consistent, self-reported and comprehensive data and information on dependencies and risks that is spatial and temporal for sectors or individual businesses, including data gathered by financial institutions (investors, lenders, insurers) associated with their investees and clients {2.2, 2.5, 4.4, 5.3.2}.
	Lack of granular, linkable data on locations of business activities across value chains and portfolios, enabling spatial analysis of impacts and dependencies alongside biodiversity data {2.7, 3.3, 3.4, 4.4, 5.3.2, 5.6.3}.
	Lack of data and models, including data to support baseline studies, especially in remote areas, for under-studied species (for example invertebrates, soil organisms, marine ecosystems, genetic diversity), or on the functioning and capacity of ecosystems to provide nature's contributions to people {2.3, 4.2.2, 5.3.2}.
	Lack of baseline data on the socio-economic, cultural and environmental conditions of Indigenous Peoples and local communities or on specific impacts on different sub-groups within communities, such as women, children and the elderly prior to commencement of business activities against which mitigation measures can be assessed {2.7, 3.6}.
	Lack of data from remote sensing tools and technology for monitoring land and sea use and change and business activities affecting biodiversity and nature's contributions to people {6.3.4}.
	Lack of scenarios and time-series data over sufficiently long periods to show the effect of actions by businesses and others (including changes to policy) on biodiversity outcomes across national and sub-national economies {5.2.3, 5.3.2, 5.5, 6.3.1, 6.3.2}.
2 Incomplete evidence Gaps characterised by missing or underdeveloped scientific information and the availability of Indigenous and local knowledge.	Knowledge within businesses of their impacts and dependencies on biodiversity and nature's contributions to people is incomplete, including how biodiversity loss translates into business risk and informs action, and going beyond economic value and productivity to include socio-cultural valuation, relational values, quality, sustainability, trends and risk of loss {2.5, 2.8, 4.5, 4.6, 5.3.2}.
	Insufficient evidence to identify and prioritise the actions needed to incentivise businesses with the greatest responsibility and influence over biodiversity and nature's contributions to people to undertake the most impactful actions {5.6, 5.7}
	Gaps in knowledge, data and documentation on species important to Indigenous Peoples and local communities and information on their rights and knowledge on benefits arising from using genetic resources, under free, prior and informed consent in accordance with national legislation {6.3.4, 6.3.5}.
	Gaps in knowledge about mechanisms linking transparency and risk disclosure (including visibility of failures) to improved biodiversity performance and outcomes, and about the conditions under which disclosure drives action {5.4, 5.6, 5.7}.
	Inadequate understanding of ecological thresholds, tipping points and feedback loops and their link to impacts of businesses on biodiversity {3.2}.
	Insufficient studies on the effectiveness and attitudes towards mechanisms, including economic and financial instruments, to shift financial flows away from industries that harm biodiversity and which consider how investments drive biodiversity loss {6.3.2}.
	Limited, verified and comparable case examples of business actions, covering their motivations, barriers, impacts and outcomes, and the factors underpinning success or failure to enable shared learning and improvement {5.5; 5.6; 5.7}.
	Insufficient studies on what methods can be considered robust and are most useful for which business contexts including through comparisons of the potential for different methods to influence both biodiversity outcomes and business practices {4.5, 4.6}.
	Gaps in knowledge of the full array of impacts from business activities (including through management of dependencies) on Indigenous Peoples and local communities that relate to biodiversity impacts and businesses responses to biodiversity loss {2.7, 4.3.1, 4.5}.
	Insufficient studies on the effectiveness of different mechanisms and types of action by businesses and others at delivering positive outcomes, including mechanisms such as environmental social impact assessment, certification schemes, behaviour change, policy effectiveness, partnership and collaboration {5.6, 5.7, 6.3}.
	Insufficient studies quantifying indirect positive and negative impacts businesses have on biodiversity, including the pathways by which these impacts occur {3.2}.
	Insufficient studies of synergistic effects, interactions and trade-offs between different business impacts on cultural significance, spiritual values and socio-economic implications including for assessing cumulative impacts on Indigenous Peoples and local communities, rural and urban poor and designing effective mitigation measures {3.6}.

Gaps in application	Description
3. Limitations of methods Gaps characterised by inability of existing methods or aspects of methods to address fundamental components of the relationship between businesses and biodiversity in the context of business decisions.	Insufficient approaches which address shortcomings in biodiversity accounting practices, such as the need to interlink management, financial and ecosystem/landscape accounts, to provide specific, time-bound and measurable indicators for monitoring purposes, or to reflect biocentric or pluricentric worldviews {4.6}.
	Insufficient approaches which appropriately incorporate or interweave Indigenous and local knowledge, the values and worldviews of Indigenous Peoples and local communities and support the participation of such knowledge holders with their free, prior and informed consent, in accordance with national legislation. {2.4, 2.7, 3.3, 3.6, 4.6.2, 4.3.1, 5.6, 5.7, 6.3.3}.
	Lack of consistent and established scenario data and modelling approaches for biodiversity-related risks which would support consistent application and comparison of methods. Specifically long-term futures are missing or not applied consistently and comprehensively to identify sustainable business strategies {2.4, 3.6, 4.6.1}.
	Methods face challenges using standardized business-relevant indicators and metrics for biodiversity-related dependencies, risks and opportunities {2.4}.
	Lack of robust, standardised approaches for independent verification of business claims about their contributions to and delivery of outcomes for biodiversity and nature's contributions to people (5.3.2, 5.6, 5.7.1, 5.7.2).
	Insufficient methods and data to translate and disaggregate global biodiversity goals into business-level, outcomes-based, timebound targets at decision relevant scales (5.2.2, 5.3.2, 5.6, 5.7)
	Insufficient methods which can operate across scales, for example supporting financial institutions to use modelled data to assess portfolios and more detailed/local level studies of dependencies {4.4.1, 5.6.4.2}.
	Methods face challenges in combining diverse data and balancing ecological, economic and social trade-offs and do not fully reflect the contributions of natural, produced, social and human capital to business activities and cannot do so with sufficient spatial and temporal detail {2.2, 2.3, 2.4}.
	Insufficient methods which go beyond species richness and other coarse measures to incorporate information on understudied species groups and can incorporate measures of functional diversity or genetic diversity. {4.2.2}.
	Insufficient methods which take into account different types of land-use and can therefore reflect differences in intensity of land-use to support decision- making related to impacts {4.4}.
4. Data accessibility and transparency Gaps characterised by insufficient flows of information, knowledge or science among groups.	Lack of clear consensus among consumers, investors and governments on what constitutes an appropriate and credible business contribution to halting and reversing global biodiversity loss and securing nature's contributions to people {5.2.2, 5.3.2}.
	Existing knowledge on biodiversity and nature's contributions to people is not accessible across all levels of the business community, including within businesses. This includes data gathered by businesses through their monitoring programmes {5.3.2, 4.5.4}.
	Existing knowledge about the diverse contexts and specific characteristics of various Indigenous Peoples and local communities including knowledge of their distinct cultural and ecological histories, unique livelihoods, worldviews and traditional practices is not accessed or accessible to businesses {4.5, 6.3.5}.
	Existing knowledge about scientifically recommended methodologies is not accessed or accessible to businesses, which results in a disconnect between the needs of businesses to adhere to the scientifically agreed-on/recommended methodologies and the applicability, availability and accessibility of scientific methods {4.5}.
	Existing knowledge across businesses of their respective impacts and dependencies are typically not connected and visible to all the relevant decision-makers across the value chain {4.4, 4.5, 5.3.2, 5.6.3}.
5. Low adoption Gaps characterised by low uptake of approaches and knowledge within specific contexts.	Available socio-cultural methods are not used often and are hard to standardize and scale for business use and benchmarking {2.3, 3.3}.
	Gaps characterised by low uptake of approaches and knowledge within specific contexts.
	Available academic methods are only partially reflected in tools aimed at businesses, these tools and associated data are fragmented and sometimes inaccessible {2.3, 3.3}.
	Limited guidance and support for small and medium-sized enterprises to overcome acute capacity and resource barriers to act to address their biodiversity impacts and dependencies and collaborate and partners with other actors to amplify their outcomes {5.3.2; 5.4, 5.7.3}.
	Limited knowledge, data and documentation on Indigenous Peoples and local communities, along with their respective rights, in accordance with national legislation, on benefits arising from using genetic resources, under free, prior and informed consent in accordance with national legislation. {6.2.2}

Appendix 1: Communication of the degree of confidence

In the methodological assessment of the impact and dependence of business on biodiversity and nature's contributions to people, the degree of confidence in each main finding is based on the quantity and quality of evidence and the level of agreement regarding that evidence (**Figure SPM.A1**). The evidence includes data, theory, models and expert judgment.

- ***Well established*:** There is a comprehensive meta-analysis or other synthesis or multiple independent studies that agree.
- ***Established but incomplete*:** There is general agreement, although only a limited number of studies exist; there is no comprehensive synthesis and/or the studies that exist address the question imprecisely.
- ***Unresolved*:** Multiple independent studies exist but their conclusions do not agree.
- ***Inconclusive*:** There is limited or no evidence, or evidence is based on suggestion or speculation.



Figure SPM.A1. The IPBES four-box model for qualitative communication of confidence. Confidence increases towards the top-right corner, as suggested by the increasing strength of shading. Source: IPBES (2016).[18] Additional details about this approach are documented in the *IPBES Guide on the Production of Assessments*.[19]

[18] IPBES (2016): *Summary for Policymakers of the Assessment Report on Pollinators, Pollination and Food Production of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. Potts, S. G., Imperatriz-Fonseca, V. L., Ngo, H. T., Biesmeijer, J. C., Breeze, T. D., Dicks, L. V., Garibaldi, L. A., Hill, R., Settele, J., Vanbergen, A. J., Aizen, M. A., Cunningham, S. A., Eardley, C., Freitas, B. M., Gallai, N., Kevan, P. G., Kovács-Hostyánszki, A., Kwapong, P. K., Li, J., Li, X., Martins, D. J., Nates-Parra, G., Pettis, J. S., Rader, R., and Viana, B. F. (eds.). IPBES secretariat, Bonn, Germany. http://doi.org/10.5281/zenodo.2616458.

[19] IPBES (2018): *The IPBES Guide on the Production of Assessments*. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, Bonn, Germany. https://ipbes.net/guide-production-assessments.