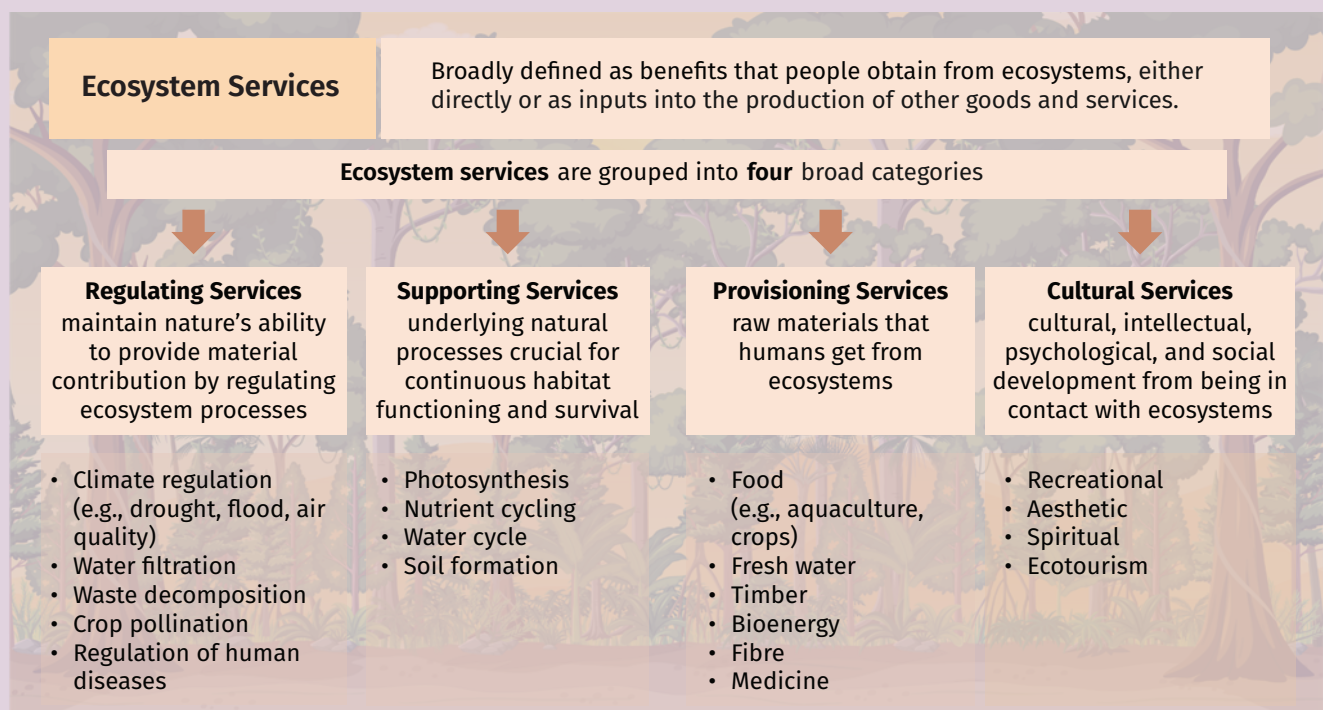


Biodiversity Loss: Implications on the Economy and Financial Stability

We rely on nature and its ecosystem to survive. Biodiversity in an ecosystem consists of various species of plants, microbes, fungi, and animals which exist and interact with each other. These species also interact with other non-living elements such as water, soil, and the sun. Humans have benefitted from these interactions within the ecosystem. The benefits are many such as supply of food, raw materials, water, and clean air. Well-functioning ecosystems also help to prevent rise in temperature. As such, it is important to maintain a balance in the ecosystem. This will ensure humans and economies can continue to benefit from nature and ecosystem services in a sustained manner (Diagram 1). The importance of biodiversity to lives and livelihood, however, is often overlooked. In the context of risks, there has been much discussion on the importance of assessing climate-related risks to our economy and financial sector, but risks arising from biodiversity loss have received little attention. This article explains the interactions between biodiversity loss and climate change, assesses how biodiversity loss affects our economy and banks, and the Bank’s focus going forward.

Diagram 1: Interconnection between people, biodiversity, ecosystem health, and provision of ecosystem services



Source: Illustration from WWF’s Living Planet Report (2012)

Understanding Malaysia’s biodiversity

Malaysia is one of the world’s megadiverse countries.¹ We are ranked 12th on the National Biodiversity Index² (Diagram 2). Natural resources (such as oil and timber) and abundant ecosystem services (such as healthy soils and clean water) have directly contributed to the country’s economic development. Various economic activities use ecosystem services either as inputs to production and operations, or as subjects of research and development (WEF, 2020). From an ecological perspective, biodiversity is integral in sustaining overall planetary

¹ A megadiverse country has at least 5,000 endemic plants and a marine ecosystem within its borders. In 1998, Conservation International identified 17 megadiverse countries (Brazil, Indonesia, Colombia, China, Mexico, Australia, Peru, India, Ecuador, United States of America, Venezuela, Papua New Guinea, Myanmar, Vietnam, Malaysia, Democratic Republic of Congo and Tanzania).

² National Biodiversity Index (NBI) is based on estimates of a country’s richness and endemism in four terrestrial vertebrate classes (i.e., amphibians, reptiles, mammals, and birds) and vascular plants. The NBI includes some adjustment allowing for country size and countries with land area less than 5,000 square kilometres to be excluded. There are 191 countries assessed under the NBI.

health. Forests, peatlands, wetlands, soil, and oceans play a key role in absorbing and storing carbon. The natural ecosystems help to protect humans from the impact of climate change that leads to natural disasters such as floods and storms.

Diagram 2: Biodiversity in Malaysia



Source: 6th National Report of Malaysia to the Convention on Biological Diversity (December 2019)

Interactions between biodiversity and climate change

Nature-related risks refer to risks from the decline or loss of ecosystem services, biodiversity, and natural assets (such as water and forests). Excessive extraction and usage can deplete resources over time and cause harm to the society and economy. Excessive economic development activities could also degrade ecosystem services. These include deforestation, pollution, overfishing, land-use change³, and other human activities that drive habitat loss and fragmentation. Climate change is also accelerating biodiversity loss and reducing the resilience of ecosystems. This heightens nature-related risks which in turn can put the viability of businesses and lives at risk. Businesses that are highly dependent on ecosystem services for ongoing business operations are most exposed to such risks. Holistic and carefully designed measures that promote responsible usage, or replenish the resources, are therefore essential to preserve lives and livelihoods.

Nature- and climate-related risks are closely connected. As with climate change, nature-related risks can manifest in physical, transition, and liability risks (Diagram 3). These risks can also lead to financial and economic losses due to a diminished capacity to adapt and build resilience against adverse events. A World Bank study⁴ assesses how much damage would be caused if certain parts of the ecosystem, like marine fishing, wild pollination, and timber supplies in the ecosystem were reduced by 90%. The study found that in East Asia and the Pacific region, this could lead to a loss of 3.4% of the GDP by 2030 compared to the baseline scenario. In Malaysia, the loss is expected to be even bigger at 6% of GDP by 2030 due to adverse impacts from the collapse of Malaysia's forestry and fisheries ecosystem services (Johnson et. al, 2021).

³ Land-use change is the transformation of natural landscape driven by human activities, either for economic and/or cultural purposes (e.g., agricultural, residential, industrial, mining, and recreation).

⁴ The World Bank study "The Economic Case for Nature: A Global Earth-Economy Model to Assess Development Policy Pathways" (Johnson et. al, 2021)

Diagram 3: Nature loss and climate change

Nature loss reduces resilience to climate change

- Loss of forests as water catchment areas exacerbates the effect of droughts.
- Bare, deforested mountaintops carry worse landslides during extreme rainfall.
- The loss of forests also means the loss of carbon sinks.

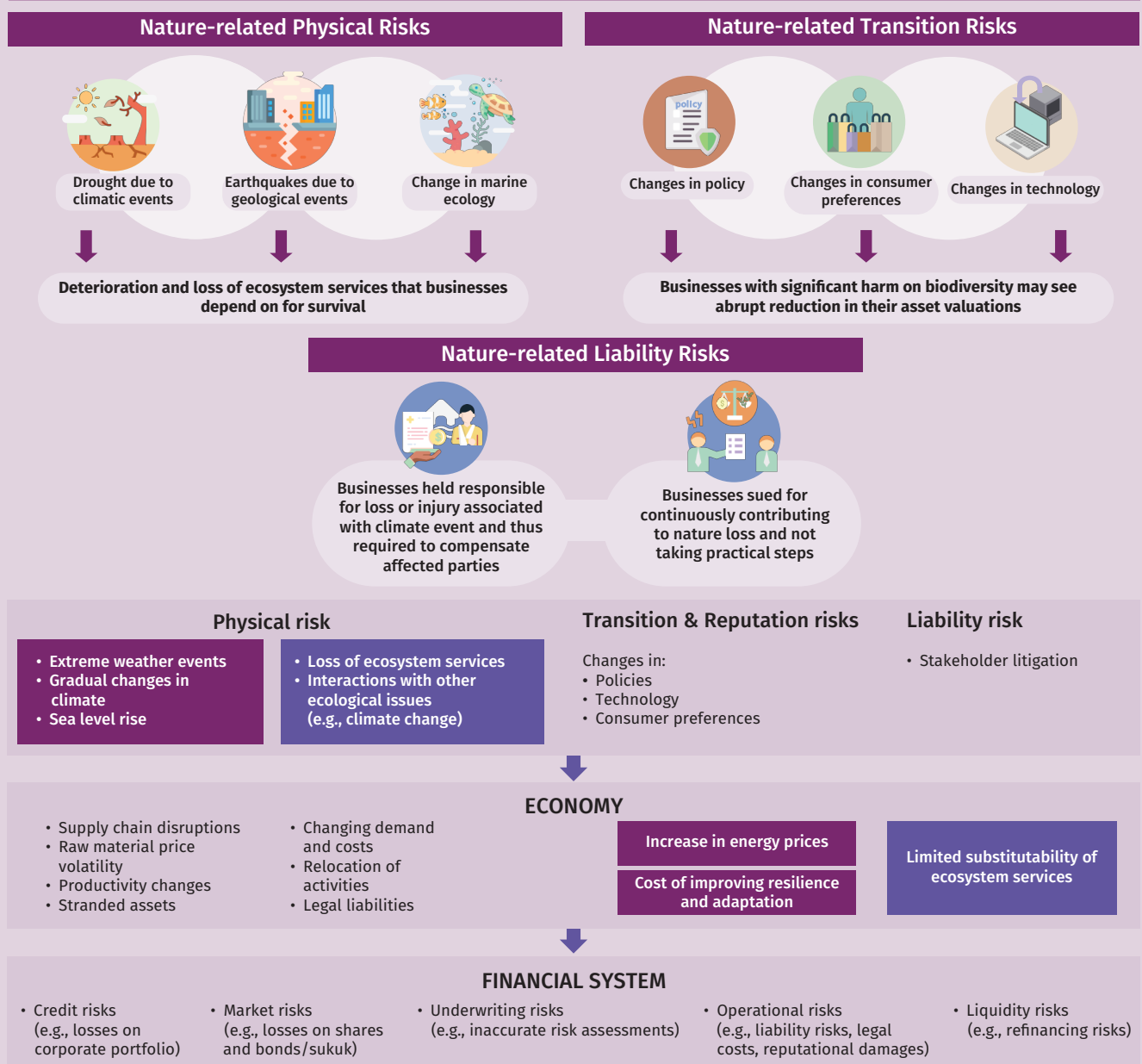


Climate change is a driver of nature loss

- Increased GHG emissions changes the water cycle and alters soil temperature and humidity.
- Extreme weather events affect wildlife and destroy habitats.
- Oceans soaking up too much carbon lead to ocean acidification, which harm marine life.

Source: Intergovernmental Panel on Climate Change (IPCC), Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

Diagram 4: Financial and economic implications of nature-related risks



Legend: Climate-related risk Nature-related risk

Source: Bank Negara Malaysia

The Bank also worked with the World Bank to study how nature, our economy, and the financial sector are connected. The study looks at the exposures of our banks to sectors and regions that are highly vulnerable to biodiversity loss and other nature-related risks. Key findings are published in a report titled “An Exploration of Nature-Related Financial Risks in Malaysia” (the Report) (Diagram 5).

Diagram 5: Key findings from the report “An Exploration of Nature-Related Financial Risks in Malaysia”⁵

- 54% of the commercial lending portfolio could currently be exposed to physical risk due to being highly or very highly dependent on one or several ecosystem services.
- Most prominent individual ecosystem services include surface water, ground water, flood and storm protection as well as climate regulations. Climate regulation entails natural carbon sinking mechanism which helps dampen the impact of climate change (Chart 1.1).
- 87% of the commercial lending are channelled to sectors which highly or very highly impact various natural assets and ecosystem services i.e., real estate activities (17%), wholesale trade (11%), construction of buildings (10%), civil engineering (6%), and retail trade (5%).
- Commercial lending contributed to the proliferation of the following impact drivers which in turn severely affected ecosystem services and natural assets: GHG emissions (61%), water use (56%), and terrestrial ecosystem use (43%) (Chart 1.2).

Chart 1.1: Dependency on ecosystem services (physical risk)

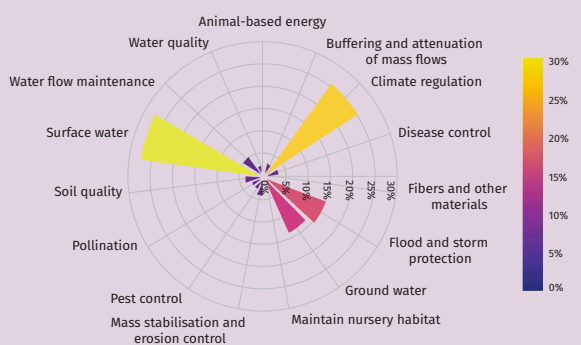


Chart 1.2: Impact of business activities on ecosystem services (transition risk)

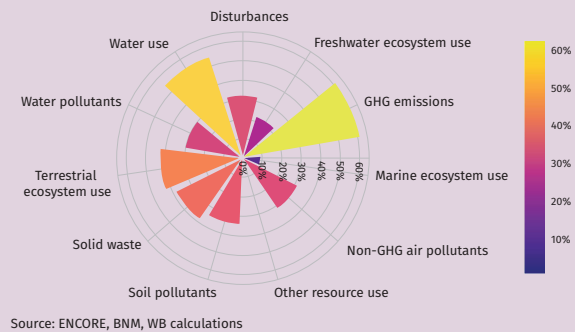
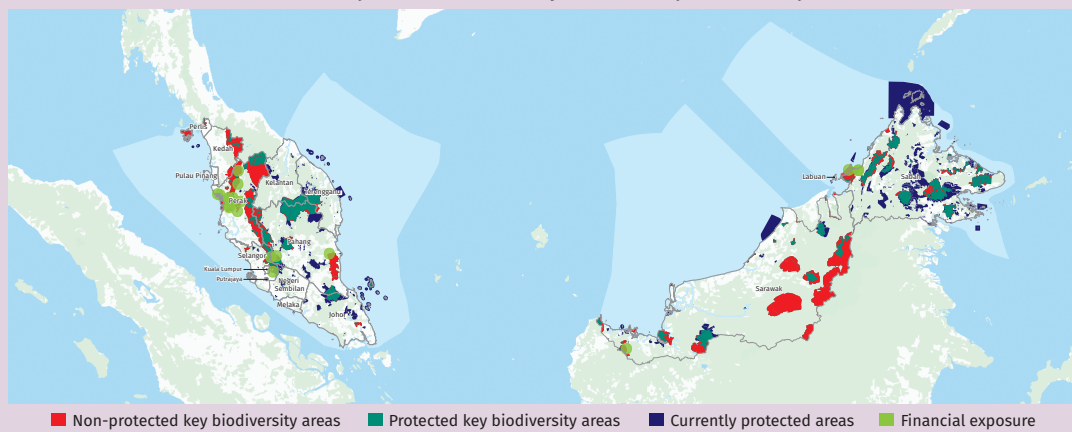


Chart 1.3: Commercial residential and non-residential purchase lending exposure by postal code area of Malaysian banks to non-protected Key Biodiversity Area (KBA)



Source: Department of Statistics Malaysia (DOSM), Integrated Biodiversity Assessment Tool (IBAT), Birdlife International Partnership, Alliance for Zero Extinction, BNM (unpublished data), Humanitarian Data Exchange 2021, WB calculations

- **Key Biodiversity Area (KBA)** are sites that contribute significantly to maintaining global biodiversity and thus are important candidates for future protective regulation. Enforcement of existing protected areas and creation of new protection areas could pose significant nature transition risk to the Malaysian banking sector and the real economy.
- RM 329 million (USD 78 million) of commercial lending are granted to firms actively operating in locations that are currently non-protected KBA. This is a conservative estimate due to limitation in the available dataset. Sectors that are typically active in non-protected KBA are agriculture and mining.
- More than 60% of commercial lending exposure are in areas that are either not protected i.e. KBA at this current juncture or in areas with limited biodiversity i.e. Kuala Lumpur and Selangor (Chart 1.3).

Source: Bank Negara Malaysia

⁵ Report on “An Exploration of Nature-Related Financial Risks in Malaysia” can be accessed here: <https://www.bnm.gov.my/documents/20124/3770663/wb-bnm-2022-report.pdf>

The report also provided recommendations for policymakers and relevant authorities to better understand and address nature-related financial risks within existing climate change policies or strategies (Table 1).

Table 1: Possible actions to address challenges of nature-related financial risks

| | <i>Less Intensive</i> ← | → <i>More Intensive</i> |
|---|--|---|
| Awareness & Policy Discourse | | |
| Raising awareness on nature-related financial risks | <p>Share World Bank and BNM report findings (Diagram 5) to key stakeholders (government, financial institutions)</p> <p>Contribute to awareness-raising programs on nature-related financial risks</p> | <p>Advocate and/or collaborate with government to include considerations of nature-related financial risks in policies & investments</p> <p>Support the government in developing a cohesive national strategy to address nature-related risks</p> |
| Capacity Building | | |
| Enhancing capacity building of relevant stakeholders | <p>JC3 to include nature-related financial risks in its capacity building and stakeholder engagements</p> <p>Collaborate with experts to deepen knowledge and develop tools for nature-related financial risks</p> | <p>Support development of incentives and financial instruments to protect biodiversity and ecosystem services</p> <p>Expand existing government grants/funds related to climate change to include protection of biodiversity and ecosystem services</p> |
| Enhancing macroeconomic surveillance capacity and risk identification | <p>Enhance technical capacity in risk transmission i.e., interactions between climate- and nature-related risks</p> <p>Imbue common factors of climate- and nature-related financial risks in surveillance framework</p> | <p>Improve data on nature-related risks at a granular level (leveraging on JC3's ongoing initiative)</p> <p>Embed nature-related financial risks in high-level reference scenarios for stress testing</p> <p>Supervisory deep-dives at banks with substantial financing in (future) protected areas</p> |
| Policy Adoption | | |
| Developing regulatory and supervisory requirements for supervised institutions | <p>Enhance existing guidance on nature-related risks in taxonomies and frameworks</p> | <p>Set expectations to understand the most relevant nature-related financial risks</p> <p>Embed nature-related financial risks in climate-related guidance (governance, disclosure, risk management)</p> <p>Communicate expectation to manage and disclose nature-related financial risks together with climate-related risks</p> <p>Develop monitoring system for new credits to be compliant with climate- and nature-related regulations</p> |

Source: Bank Negara Malaysia

Future Work

Financial industries around the world are just starting to pay attention to the issue of biodiversity loss and nature-related financial risks. A similar situation is also observed in Malaysia. This is mainly due to low awareness and understanding of how climate and nature are connected. The potential impact of risks associated with climate change and nature to the financial sector, economy, and society as a whole is also not well-appreciated or understood. As the financial industry begins to deal with risks from climate change, it is also necessary for the sector to start building knowledge on nature-related financial risks. These risks are closely related. So, approaches and strategies taken to manage climate-related risks can be used with some adjustments to begin to also deal with risks arising from biodiversity loss. Where relevant, nature-related financial risk considerations should be integrated into current practices, policies, and frameworks for climate risk management. Financial institutions should also consider educating their clients on nature-related risks and the impact on them. The development of nature-based solutions⁶ also creates new financing prospects for financial institutions that will bring about positive values to the environment and society.

While they are considerably more complex to deal with, the impact of nature-related risks is likely to be more significant than climate-related risks. Current strategies to respond to climate-related risks can serve as important building blocks for financial institutions to consider nature-related financial risks in their strategies and actions. To this end, the Bank plans to extend current engagements and capacity building initiatives within the Bank and financial sector to the consideration of nature-related risks. The immediate focus is to identify opportunities to build on ongoing efforts to strengthen climate resilience. For example, the JC3 sub-committee on Bridging Data Gaps (BDG)⁷ is already exploring ways to improve collection of data relevant to nature-related risks in Malaysia. This aims to facilitate more granular analysis on how the financial sector drives nature-related risks and on the flip side, the impact of biodiversity loss to the financial system, to serve as a basis for prioritising the industry's response to nature-related risks.

⁶ Nature-based solutions are actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal, and marine ecosystems while simultaneously generating environmental, social, and economic benefits, and building resilience (United Nations Environment Programme).

⁷ The BDG had, on 16 December 2022, published a data catalogue as a source of reference on climate and environmental data for the financial sector. For more information, visit <https://www.bnm.gov.my/-/jc3-climate-data-catalog>

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