

Taking root

Mainstreaming natural capital accounting
to meet global biodiversity goals

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Contents

Executive Summary	3
1. Accounting for environmental impact	5
2. It takes two to tango	9
3. Bottom-up: the missing link?.....	13
4. Summing up.....	24
About the Institute.....	25
Disclaimer	26

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Executive Summary

The UN's goal to halt and reverse biodiversity loss by 2030 is an ambitious target that looks increasingly unrealistic as the deadline approaches. Biodiversity is diminishing at an alarming pace, in the process exposing the world's nature-dependent global gross domestic product (GDP)—about 55% of the total—to disruption. It's increasingly clear that the world needs new tools to sustainably manage environmental resources for the long term.

Natural Capital Accounting (NCA) could be an integral part of the solution. First introduced in the 1970s, it is an economic approach that weaves the value of natural assets into decision making throughout markets—enabling organizations to account for their impact and dependence on natural capital (and therefore biodiversity) every time they make an economic or financial decision.

The struggle to become mainstream

But despite being almost half a century old, NCA has struggled to mainstream. Natural assets continue to be excluded as a core component of GDP calculations. Instead, they are compiled in separate, secondary accounts. Few nations heavily invest to create complete natural capital accounts, and as a result the NCA figures that exist are often disregarded by companies, financial institutions, and investors. NCA as it stands today has little impact on biodiversity trends.

The failure of the framework to gain more traction is largely down to slow top-down attempts by governments and multilateral institutions to adopt NCA. A combination of factors—including the relative youth of these frameworks, the difficulty of translating, tallying, and then converting environmental data into monetary value—prevents NCA solutions from being broadly adopted.

Bottom-up can be the solution

This report argues NCA can only contribute to the UN's 2030 goal through more concerted mainstreaming efforts by 'bottom up' organizations, such as financial institutions and investors, corporates, and non-governmental organizations. If these organizations can be persuaded of the merits of taking NCA seriously, they can help to supply the statistics and refine the methods necessary to generate reliable figures. Their engagement could provide important pressure on governments and regulators to meet and enforce NCA requirements more seriously.

The paper presents five strategies with case studies to provide private sector organizations with inspiration: proving the business case for NCA; providing governments with data; establishing its methodological credibility; ensuring the future of sustainability reporting; and innovating within standardized frameworks. The paper concludes with an idealized roadmap out to 2030 for how NCA could be brought into the mainstream of economic accounting.

The road remains shaky

It should be underscored that NCA presents a diagnosis for biodiversity loss rather than a cure. But, if it can be broadly introduced, the framework would enable governments, financial institutions, investors, corporates, NGOs and more to calculate both the state of local and regional ecosystems and the economic cost if they are further damaged—helping organizations identify and implement the most effective countermeasures.

The UN's 2030 biodiversity reversal target could already be out of reach, but it remains important for the world to coalesce around a natural capital quantitative process as soon as possible, so that we can quantify the problem of biodiversity loss and begin to reverse it.

1. Accounting for environmental impact

At a glance

- The UN aims to halt and reverse biodiversity declines by 2030. Current trends imply this will be hard to achieve.
 - Natural capital accounting offers a promising solution if it can be mainstreamed quickly.
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Decades of focus on expanding output comes at an immense cost to the global environment. For instance, the relative abundance of monitored wildlife populations declined 69% between 1969 and 2018¹. Global fish stocks followed a similar path, with only 65% at a biologically sustainable level today, down from over 90% in 1974². These trends are unprecedented on a human time scale, given that species extinction rates are now tens to hundreds of times higher than at any time over the past 10 million years³.

These trends are clearly unsustainable, but society is only beginning to understand their economic and social significance. Most studies conclude we have a substantial economic dependence on nature: one analysis found 55% of the world's gross domestic product (GDP) is moderately or highly dependent on nature⁴; and World Bank modeling suggests declining ecosystem services could materially reduce GDP, particularly among the poorest nations (Figure 1).

¹ WWF (2022), Living Planet Report 2022—Building a nature-positive society

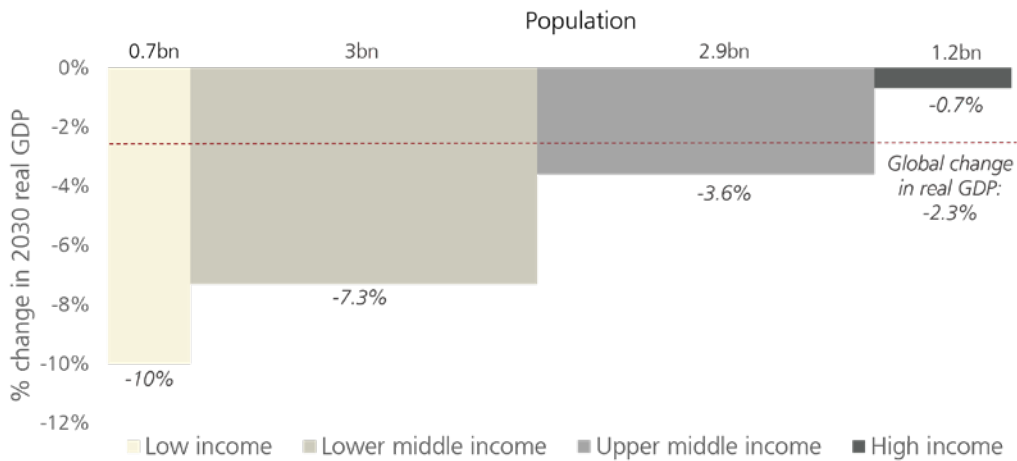
² FAO (2022), The State of World Fisheries and Aquaculture 2022: Towards blue transformation

³ IPBES (2019), Global assessment report of the intergovernmental science-policy platform on biodiversity and ecosystem services.

⁴ PwC (2023), Managing Nature Risk: From understanding to action.

Figure 1. Declining ecosystem services could cost the world 2.3% in annual GDP by 2030.

Change in 2030 real GDP under a partial ecosystem collapse scenario vs. a no-tipping-point scenario.



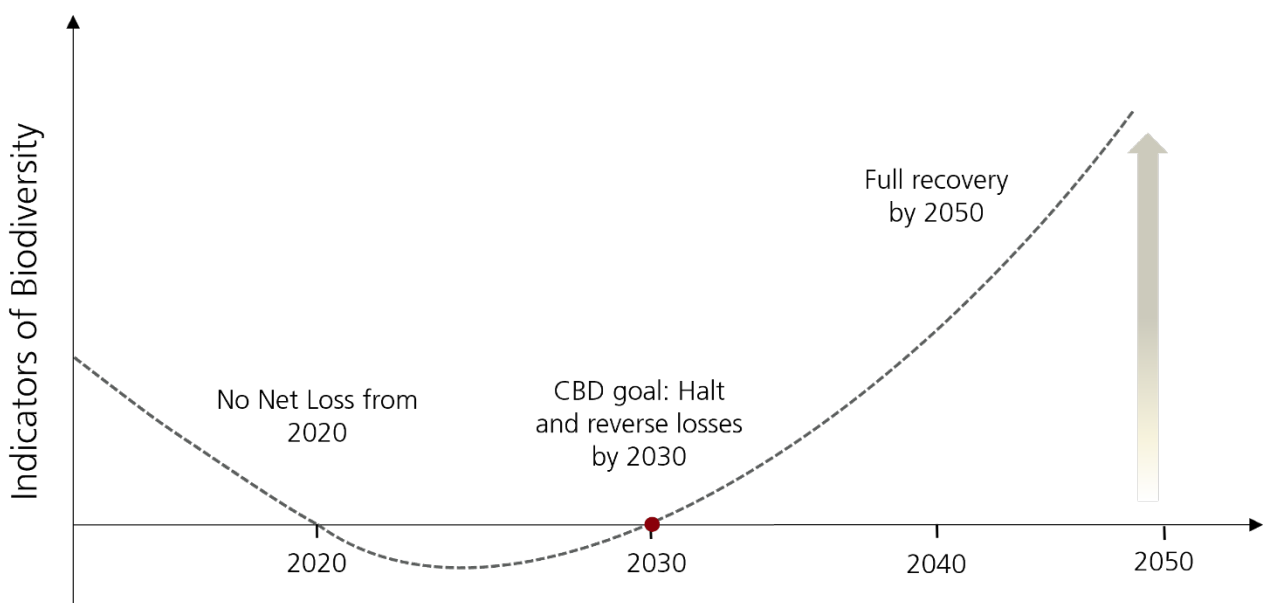
Source: UBS; Johnson, J. et al (2021), The Economic case for nature, World Bank Group.

1.1. The 2030 biodiversity goal and the promise of Natural Capital Accounting

The evidence paints a gloomy picture, but a few glimmers of light break through. For instance, the UN Convention on Biological Diversity's (CBD) headline aim to 'halt and reverse' of biodiversity loss by 2030 (Figure 2)—a hugely ambitious goal agreed between almost 200 countries—reflects a strong global consensus to upend long-running environmental decline.

Figure 2. The Convention on Biological Diversity aims to make the world 'nature positive' by 2030.

This conceptual figure shows the trends in biodiversity indicators required to meet the Convention on Biological Diversity's goal to become 'nature positive' from 2030.



Source: UBS; WWF (2022), Living Planet Report.

But setting a target is a lot easier than meeting one, and the world's biodiversity remains in a tailspin just seven years away from the CBD's 2030 deadline. We need to identify and agree upon new approaches to conserve and restore nature, quickly.

NCA could be an integral part of the solution (Box 1). Society exploits nature so unsustainably because its value is often overlooked in economic and political decision making. Governments tend to make decisions using the latest GDP figures—which completely ignore the value of natural capital⁵—and corporates often fail to consider factors like their dependence on water tables, timber supplies and pollinators. All would do well to consider the extent that their wealth depends on ecosystem services, but particularly those—such as agriculture-dominated countries or water-intensive industries—where nature depletion can create material economic and financial risks.

Box 1: What is Natural Capital Accounting?

NCA emerged in the 1970s as a framework for conceptualizing how society impacts and depends on nature. It classifies nature into 'stocks' (such as land), which can be renewable (forests) and non-renewable (fossil fuels). Nature-related 'services' (i.e., benefits and costs) flow from these stocks.

A detailed overview of NCA is beyond the scope of this report—it can be found in a recently published UBS whitepaper⁶—but the framework has a key goal in mind: 'what can be measured, can be managed'. NCA seeks to measure and then integrate nature's value into accounting practices, from government statistics to corporate reports. By doing so, organizations can take account of their dependence on natural capital (and therefore biodiversity) every time they make an economic or financial decision (Box 2).

Box 2: Biodiversity emerges from healthy natural capital

Biodiversity is a different concept to natural capital, despite analyses often using them interchangeably. Simply put, biodiversity is a measure of the variability in living things which can be expressed on different 'levels', such as between genes, species, or ecosystems. Its metrics differ depending on what is being measured. Natural capital is an economic metaphor for the total stock of physical (non-living) and biological (living) stocks, and their limited capacity to produce ecosystem services. Higher biodiversity emerges from healthier 'living' natural capital, in practice making it a subset of natural capital.

Advocates of NCA believe that introducing it enables firms (or governments) to better understand the reliance of their business model (or economic policy) on ecosystem services. The hope is that they would more carefully weigh projects that seek to make money in the short run by depleting natural capital, over time shifting their mindset from output economics to impact economics.⁷

⁵ UBS Sustainability and Impact Institute (2023), *There's a problem with GDP: GDP is an incomplete measure. It counts the price of everything but the impact of nothing.*

⁶ UBS (2022), *From Ozone to Oxygen: Opportunities and Risks in Natural Capital.*

⁷ See UBS Sustainability and Impact Institute (2023), *The rise of the Impact Economy: Evolving to the next level.*

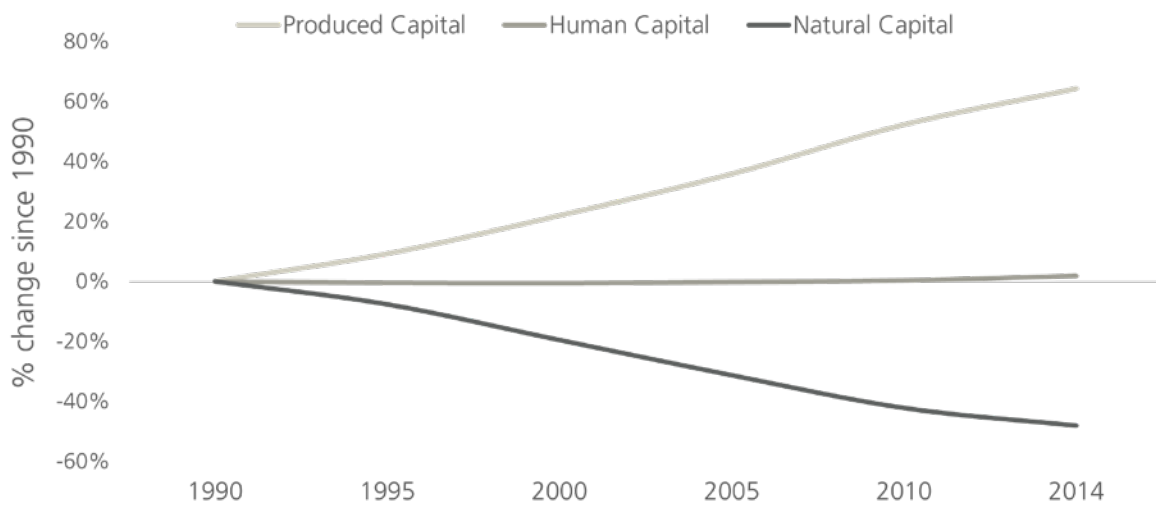
1.2. Now more than ever

NCA is not a new concept. It was first introduced in the 1970s and has been promoted in international frameworks since the 1990s. Unfortunately, it has had little impact to date on policy making and attitudes to economic decision making.

Few governments have comprehensive national natural capital accounts, and corporates and investors rarely use it. All too often these organizations seem to regard accounting for nature as a zero-sum endeavor, costing revenue while offering few tangible insights. Short-term incentives such as quarterly profit targets exacerbate this mindset—even as the world’s natural capital continues to decline (Figure 3).

Figure 3. The value of natural capital per capita has declined by around 48% since 1990.

Natural capital’s value per capita declined 2.6% per annum between 1990 to 2014. Note the global population grew by 1.3% per annum over the same period, meaning the value of natural capital declined closer to 1.3%.



Source: UBS; Managi and Kumar (2018), *Inclusive wealth report 2018*

Fundamental and concerted efforts are needed to halt and reverse biodiversity loss, or the world’s environment will degrade even further—increasing the risk of harm to many economic sectors and human habitats.

NCA arguably offers the best way to integrate nature into the decisions that are made throughout an economy, from governments to corporates and across value chains. It could, if widely used, help to track changes to the living natural capital that defines biodiversity trends. But if NCA is to be effective, it needs to be broadly recognized, implemented, and enforced. Today it remains niche and far from mainstream accounting practices.

This report outlines why mainstreaming NCA is important to increase the chances of meeting the CBD’s 2030 goal. It looks at the state of current progress, which has been slow and largely top-down, driven by governments. It then considers how to encourage corporates, investors, and NGOs⁸ to conduct more ‘bottom-up’ activity to help mainstream NCA and increase its contribution to the CBD’s 2030 goal.

⁸ This report uses a high-level definition of NGOs, referring to any private, independent non-profit organizations that operate separately from government, covering academic bodies, think tanks and industry collaborations.

2. It takes two to tango

At a glance

- NCA emerged from academia decades ago⁹, and since then governments have driven its development from the top down.
 - Governments play a vital role, but NCA's mainstreaming is proving too slow to meaningfully support the CBD's 2030 goal.
 - Complementary efforts from finance, corporates, and NGOs (the 'bottom') can expedite its development and eventual mainstreaming.
-

2.1. Top-down progress: Necessarily slow?

The story behind the introduction of NCA starts with the System of National Accounts (SNA). The SNA was conceived in the 1930s, standardized by the UN in 1953, and has been periodically revised ever since. It builds up a country's GDP from market transactions to provide a measure of its output.

Over the latter half of the 20th Century, several prominent critics chastised GDP for what it fails to cover. As US Democratic politician Robert Kennedy famously noted in March 1968, GDP "measures everything... except that which makes life worthwhile"¹⁰—focusing too much on how much is produced ('the output economy'), rather than what people really value ('the impact economy').¹¹

Prominent critics pointed in particular to the absence of the value of nature in GDP's metrics. In 1974 American economists William Nordhaus and James Tobin provocatively asked, 'Is growth obsolete?', arguing measures that included the costs of environmental problems and urbanization were better reflections of welfare¹². These critiques gained traction and, eventually, impacted policy. Riding on the coattails of the 1992 'Rio Summit', the UN revised the SNA in 1993, broadening it to include 'supplemental accounts' for energy, water, and land.

That led countries to begin measuring their environmental impact, albeit in a piecemeal fashion. For instance, in 1996 many countries analyzed their environmental stocks and flows for the first time when reporting GHG emissions and carbon sequestrations. In 2007, the European Commission concluded that the SNA and GDP should be complemented with economic and social indicators. Four

⁹ For a brief history see Brandon, C. et al (2021), *Integrating natural capital into national accounts: Three decades of promise and challenge*.

¹⁰ Centre for the Understanding of Sustainable Prosperity (2018), *Everything, in short, except that which makes life worthwhile*.

¹¹ See UBS Sustainability and Impact Institute (2023), *The rise of the Impact Economy: Evolving to the next level*.

¹² Nordhaus, T. and Tobin, J. (1972), *Is growth obsolete?*, NBER.

years later, the World Bank, International Monetary Fund and World Trade Organization complemented GDP via satellite accounts on the environment.

Crucially, these additional metrics continued to be excluded when calculating GDP. Instead, two sets of national accounts were established—the SNA, and ‘satellite’ accounts, which include the environment¹³. Generally, these satellite environmental accounts were seen as less important and thus some countries report them poorly, leading companies and investors to pay them little attention.

Ideally GDP would directly account for natural capital, making it a core component of its calculations and thus impossible to ignore¹⁴. However, in line with ‘don’t let the perfect be the enemy of the good’, environmental accounts offer a useful tool for tracking nature’s health at a time when there is no consensus on how to integrate natural capital with conventional macroeconomics.

2.2. Natural capital in environmental accounts

Today many countries are busy compiling environmental accounts. Like the conventional SNA, these require a framework to standardize natural capital measurement. The UN Statistical Commission introduced the System of Environmental-Economic Accounting (SEEA) to do just this (Box 3). The eventual aim is to produce a figure reflecting trends in a country’s natural capital—‘Natural Asset Wealth’¹⁵—informed by a range of supporting environmental-economic statistics.¹⁶

Box 3: UN System of Environmental-Economic Accounting

SEEA exists to standardize national natural capital measurement. There are two types of accounts, one of which is more advanced than the other.

The more widely used but basic are the SEEA Central Framework (SEEA CF) accounts. These measure productive natural assets (like water and energy) and their flows back into the environment: like measuring the stock of soil and any changes to it. They can be monetized, but many are simply stock accounts.

SEEA Ecosystem Accounts (SEEA EA) are more sophisticated but less widely used. They measure ecosystem assets and their associated goods and ecosystem services—an approach closer to a natural capital approach than SEEA EF because they measure environments as ecosystems (in terms of extent, condition, and flow of services) and include monetary accounts (valuing the supply and use of ecosystem services, and the NPV of future services).

SEEA CF was introduced in 2012. SEEA EA was introduced in 2014, and majorly updated in 2021.

¹³ Notably the 2025 SNA revision plans will put more environmental assets on the SNA balance sheet, but only those with observable market values.

¹⁴ For a recent technical discussion on integrating natural capital *into* GDP calculations (rather than having environmental accounts sit alongside macroeconomic data), see Dohring, B. et al (2023), *Reflections on the role of natural capital for economic activities*, Directorate-Generale for Economic and Financial Affairs, European Commission, Discussion Paper 180 European Economy.

¹⁵ Arrow, K., et al (2004). *Are We Consuming Too Much?*, Journal of Economic Perspectives; Dasgupta, P. (2021), *The Economics of Biodiversity: The Dasgupta Review*, HM Treasury; Hamilton, K., & Hartwick, J. (2014), *Wealth and Sustainability*, Oxford Review of Economic Policy.

¹⁶ Office of Science and Technology Policy, Office of Management and Budget, and Department of Commerce (2023), National Strategy to Develop Statistics for Environmental-Economic Statistics: A U.S. System of Natural Capital Accounting and Associated Environmental-Economic Statistics.

The top-down actions from governments to create national accounts are integral to mainstream NCA. National accounts allow analysts to track changes in national environments, and provide credible data and baselines for companies, NGOs, and investors to use in their own analyses. Only governments can create them.

But despite the irreplaceable role of governments, they have generally been lackluster in mainstreaming national NCA. There are several reasons for this:

- **Some international frameworks are new:** While the ‘conventional’ SNA has enjoyed decades of refinement and credibility building, SEEA accounts are in their infancy. The non-experimental version of SEEA EA was only published in 2021. Governments are still digesting them.
- **Translating SEEA into domestic accounts is slow:** The SEEA EA has only 41 implementing countries as of 2022, and none of them yet have a full set of accounts¹⁷. Even countries who are ahead of the pack when it comes to implementing SEEA EA, such as the UK, are still years away from providing comprehensive accounts. The US, which arguably has most resources at its disposal to measure and regularly update its accounts, predicts it will only be able to offer full accounts in 2035 at the earliest¹⁸—five years after the CBD’s 2030 goal. Resource- and expertise-strapped governments will probably take longer.
- **Usability and uncertainty:** While the NCA’s use is growing, surveys show few policymakers use existing accounts. This is likely because it is difficult to convert environmental data into monetary values, a prerequisite to discussing natural capital alongside GDP¹⁹. There are several reasons for this. Some uncertainty surrounds SEEA EA and CF methodology; the frameworks are general guides for organizing accounts, with countries given significant freedom to define their own approaches. Plus, statistical offices need to make explicit measurement and valuation decisions, injecting uncertainty into the already-high-cost process of SEEA implementation—potentially creating information silos if sector- or department-specific policymakers are not involved.
- **Data challenges remain:** Creating SEEA EA-aligned accounts mostly involves gathering existing-but-disparate government statistics, avoiding the need for new data. However, the current data landscape is a smorgasbord, creating confusion on what data to use, where to find it, and how to interpret it²⁰. For instance, a review of 28 natural capital-related data platforms highlighted considerable variability in their relevance, accessibility, transparency, and flexibility²¹.
- **Singing from different hymn sheets:** Implementing officials may simply disagree with NCA, have other priorities, or harbor political concerns, such as NCA highlighting politically sensitive issues (e.g., state over-dependence on or depletion of certain resources)²². These political divergences exist across the development spectrum. For instance, after pursuing a national NCA program for the minerals sector in the early 1990s, the US Congress published a stop-order due to

¹⁷ UN Statistical Division (2023), *Global Assessment of Environmental-Economic Accounting and Supporting Statistics 2022*.

¹⁸ Office of Science and Technology Policy, Office of Management and Budget, and Department of Commerce (2023), *National Strategy to Develop Statistics for Environmental-Economic Statistics: A U.S. System of Natural Capital Accounting and Associated Environmental-Economic Statistics*.

¹⁹ Fairbrass, A. et al (2020), *The natural capital indicator framework (NCIF) for improved national natural capital reporting*.

²⁰ In places governments are tackling this— see the EU’s *SELINA* project, a platform to share best practice NCA methodologies, including in the private sector— but the field has a long way to go before standard data and methods emerge.

²¹ Green Growth Knowledge Partnership (2020), *Natural Capital platforms and tools for green growth planning*.

²² Vardon, M. et al (2023), *From COVID-19 to Green Recovery with Natural Capital Accounting*.

political controversy over the account's usefulness²³. Chile also shelved its early NCA program after highlighting the potential unsustainability of forest-based country's development strategies²⁴.

Combined, these factors limit NCA's development to a snail's pace, maintaining a low appreciation of the damage being done to natural capital.

²³ Cavanagh, S. et al (2001), *National environmental policy during the Clinton years*, Resources for the Future, P28; Eden, B. (2013), *Reconciling theory and practice in environmental accounting*, Statistics Netherlands.

²⁴ Hect, J. (2000), *Lessons learned from environmental accounting: Findings from nine case studies*, IUCN as mentioned in Virto, R. et al (2018), *Natural capital accounts and public policy decisions: Findings from a survey*, Ecological Economics.

3. Bottom-up: the missing link?

At a glance

- Private sector organizations can speed up NCA's development by pursuing their own analyses.
 - Specifically, bottom-up efforts can mainstream NCA by providing data; establishing credibility; ensuring future reporting is fit-for-purpose; and innovating while standardizing.
 - We provide an idealized roadmap out to 2030 for how the bottom-up and top-down can mainstream NCA, maximizing its contribution to the CBD's 2030 goal.
-

The private sector is responsible for the lion's share of the output economy's environmental impact.²⁵ This means a microeconomic focus—via bottom-up natural capital accounting—is essential to measure what we hope to manage.

3.1. Biodiversity reporting remains nascent, let alone NCA

Today, bottom-up actions to create transparency around nature impacts and dependencies are still quite nascent.

On the plus side, sustainability reporting is now a norm—with the proportion of the S&P 500 stock index publishing sustainability reports increasing from 20% to 92% from 2011 to 2020²⁶. But only 46% of the largest global companies said they at least qualitatively recognize biodiversity loss as a material business risk²⁷. Other data paints a similar picture; less than half of companies reporting to the Carbon Disclosure Project consider biodiversity in their strategies²⁸.

However, there is growing momentum to consider the impact of business activity on nature. While just under half of large corporates recognize biodiversity loss as a risk, this has risen from 28% in 2020²⁹. Voluntary reporting initiatives are also making strides, such as the Capitals Coalition and TNFD (UBS is a member of both). When considered alongside regulations like the EU's Corporate Sustainability Reporting Directive (CSRD), they may help to catalyze bottom-up biodiversity data collection, analysis, and reporting in the medium term.

²⁵ See UBS Sustainability and Impact Institute (2023), *The rise of the Impact Economy: Evolving to the next level*.

²⁶ G&A (2021), *Sustainability reporting in focus*.

²⁷ KPMG (2022), *Reporting the risk from biodiversity loss*; Survey covers G250 companies.

²⁸ CDP (2022), *New data shows companies recognizing biodiversity risks but majority not turning commitments into action*.

²⁹ KPMG (2022), *Ibid*.

Full NCA reporting by corporates—the ‘holy grail’ of tracking business impacts and dependencies on nature³⁰—is essentially non-existent today. But, like biodiversity reporting, initiatives to encourage NCA are making rapid gains, notably the Value Balancing Alliance’s recent EU-funded ‘Transparent Project’ that aims to standardize corporate NCA (more below)³¹.

3.2. What’s the incentive?

Despite these undercurrents, barriers common to many areas of sustainability disincentivize private sector organizations from picking up the tools of NCA: the cost of gathering disparate and complicated environmental data; a lack of specialist skills, particularly to analyze specialist geospatial data for ecosystems; and classic attribution issues that sit at the heart of many environmental externalities (is a company responsible for pollution occurring far upstream in its supply chain?). Fortunately, these barriers can all be addressed over time with concerted effort.

A more fundamental hurdle is that today’s economic model simply does not incentivize bottom-up actors to adopt NCA. The benefits (and costs) of environmental management accrue over long periods of time and generally flow not just to those doing the managing (‘public goods’)—discouraging bottom-line focused companies and investors from adopting NCA of their own volition.

In the face of these issues, it’s important to lay out the tangible benefits of adopting NCA for private sector organizations, to avoid it being seen as just another expensive reporting burden:

- **Financial opportunity:** NCA is not purely an operational cost. It highlights a business’s impact and dependence on nature, helping them identify areas for efficiency gains or cost savings. For instance, recent analysis by management consultant McKinsey highlights how corporates have 12 levers at their disposal to reduce pressures on natural capital that could also generate a positive return on investment to the tune of USD 700 billion by 2050 if implemented fully across the globe³².
- **Anticipating the coming demands of regulation:** NCA involves collecting and reporting lots of environmental data, helping organizations prepare for the coming wave of biodiversity reporting. For instance, governments are starting to implement Target 15 of the Global Biodiversity Framework, requiring large organizations to assess and disclose their risks, impacts and dependencies on biodiversity by 2030. Further, a key initiative in this space is the Taskforce on Nature-related Financial Disclosures (TNFD), which will create demand for regular biodiversity risk reporting if it treads the same path as the Taskforce on Climate-related Financial Disclosures (TCFD), already mandatory in several countries. This is part of a longer trend towards increasing governance of biodiversity by governments—for instance, the number of biodiversity-relevant taxes roughly doubled between 1990 and 2021³³—and

³⁰ Biodiversity accounting involves disclosing impacts on nature through specific drivers, such as water consumption. NCA involves measuring an accounting a company’s *dependence and impact* on the natural world through physical stocks & flows and sometimes *monetary values*. Efforts are ongoing to make biodiversity accounting more like NCA, through either reporting principles (see Biodiversity Disclosure Project (July 2023), *2023 Corporate Disclosure Frameworks Tracker*) or standardized guidance (such as the EU-funded (2021—2024) ALIGN project, see UNEP-WCMC et al (2022), *Recommendations for a standard on corporate biodiversity measurement and valuation, Aligning accounting approaches for nature*).

³¹ Transparent Project et al (June 2023), *Standardized natural capital management accounting: A methodology for promoting the integration of nature in business decision making*.

³² McKinsey (2022), *Nature in the balance: What companies can do to restore natural capital*; McKinsey analysed 47 levers, with 12 showing a positive ROI.

³³ OECD (2021), *Tracking economic instruments and finance for biodiversity 2021*.

significant regulations are already emerging today, such as France’s requirement for biodiversity foot printing, and the EU’s Corporate Sustainability Report Directive (which will require impact reporting) and deforestation due diligence law.

- **Business strategy:** NCA provides companies with greater visibility on their business impact and dependence across generally opaque value chains. For instance, the framework enables businesses to identify and manage nature-related risks—such as their impact on water supplies in areas of high competition—and can help them quantify their dependence on those supplies via monetized figures. Last, the adoption of NCA and the associated data gathering can reduce disclosure and assurance burdens if it is done in a standardized way that facilitates peer comparison³⁴.

NCA presents tangible benefits for private sector organizations today, and these may well grow in the future—particularly for businesses operating in sectors whose gross value added entirely depends on nature. These include a broad swathe of companies, including those operating in agriculture, forestry, fishery and aquaculture, food, beverages and tobacco, and construction³⁵.

3.3. Bottom-up strategies

The rest of this paper outlines five bottom-up strategies and an idealized roadmap to help mainstream NCA in support of the CBD’s 2030 goal.

1. Prove the business case

While the value of conventional national accounts is almost universally accepted, national NCA remains unproven at scale³⁶. This creates a ‘Catch-22’: a lack of national natural accounts undermines the case for using NCA at the bottom (due to a lack of credible data, low legitimacy, and no national baselines).

Private sector organizations could plug this credibility gap by doing their own NCA. The framework could be normalized and advanced in private sector uses by regularly publishing organization-level NCA assessments in line with well-known standards³⁷, sharing learnings through industry forums. Proving the business case for NCA and demonstrating clear demand for its implementation would help to address the issue of low credibility of national NCA. That would help to remove a key-but-subtle barrier that is reported across surveys as holding back the framework’s top-down development³⁸.

Pioneer efforts could also ‘road test’ the data and metrics of national accounts as they emerge to ensure they are fit-for-purpose and business-relevant. Groups such as the Value Balancing Alliance already do this, testing new methodologies to translate environmental and social impacts into comparable financial data, including monetizing nature-related impacts. A sensible starting place could be the TNFD’s ‘LEAP’ framework, which guides organizations to start with the most material areas first³⁹.

³⁴ Capitals Coalition (2022), *Time to Take Stock: Improving corporate natural capital accounting with asset registers of stocks, ecological equivalency, double entry bookkeeping and statements of position and performance*.

³⁵ These sectors’ GVA is fully dependent on nature, according to PwC (2023), *Managing nature risk: From understanding to action*.

³⁶ Pritchard, R. and van der Horst, D. (2018), *Monetary natural capital assessment in the private sector: A review of current status and research needs*.

³⁷ The Transparent Project’s Natural Capital Accounting Methodology (NCMA) is a recent industry standard with input from a wide range of players. We believe this could position the NCMA as a ‘standard of standards’ in the current alphabet soup of competing methodologies; see Transparent Project et al (June 2023), *Standardized natural capital management accounting: A methodology for promoting the integration of nature in business decision making*.

³⁸ Brandon, C. et al (2021), *Integrating natural capital into national accounts: Three decades of promise and challenge*.

³⁹ TNFD (2022), *The LEAP Approach: Locate, Evaluate, Assess, and Prepare*.

Sectors that significantly depend on natural capital such as mining and forestry stand to benefit the most from taking NCA seriously, so this creates a strong case for them to lead proof-of-concept NCA assessments (Box 4). The road testing of emerging national accounts would also create a link between end users and national statistical agencies, which should help to ensure accounts meet the needs of markets (Box 5).

Box 4: Case study: Holcim Spain’s natural capital accounting approach towards quarries

Holcim Spain piloted innovative NCA methodologies for assessing ecosystem services at their quarries in 2021⁴⁰. Holcim’s work is particularly innovative for focusing on the business case for better national NCA, through their transparent corporate-driven assessment:

- **Critically highlighting the shortfalls of national data:** For instance, Holcim showed that Spain’s biodiversity maps, produced in 2013, were not business-useful for quarry-level assessments at a 5km x 5km scale, creating a business case for better NCA data.
- **Joint initiative with the United Nations Statistical Division (UNSD):** Holcim undertook the pilot as part of a UNSD program, which meant their work had a detailed write up. This shares the pilot’s experiences through an independent organization, helping prove NCA’s business-relevance by adding credibility to the study and sending it to a wider audience. The detailed write-up is exactly why their work is included in this report.

⁴⁰ Lammerant, J. (2021), *Business and Natural Capital Accounting Case Study: Quarry restoration by Holcim, Spain*. United Nations Statistical Office.

Box 5: Case Study: EBRD's Natural Capital Valuation Model

The European Bank for Reconstruction and Development (EBRD) finances projects in three continents, exposing its balance sheet to many unlike nature-related risks that may be difficult to articulate with conventional financial tools. Addressing this blind spot, the EBRD commissioned Arcadis and partners to develop the Natural Capital Valuation (NCV) model. The NCV model identifies nature-related risks and investment opportunities within a particular landscape, translating them into economic terms using a standardized framework. It links to the recommendations of the Taskforce on Nature-related Financial Disclosures (TNFD) and the need to reflect nature-related risks in financial terms. The model demonstrates an innovative example of using NCA for several reasons:

- **Aligned with SEEA:** The model is built on SEEA's definitions and concepts, by spatially analyzing activities at the landscape scale and across multiple ecosystem types and services. Models like this could help behind-the-curve governments form their own accounts.
- **Multiple use cases:** The Bank is developing its use cases, such as evaluating the green credentials of potential nature-related risk management actions and investment projects. For instance, in a pilot study, the model suggested investments that raise water quality around the Aral Sea could generate value gains of around USD 4 million, through higher fish stocks. By articulating impact, trade-offs and more, the model helps normalize NCA as a tool for multilateral development banks.
- **Shortcomings of national data:** The model highlights the shortcomings of today's national environmental data. For instance, available data is typically country-level—while the model requires sub-national information—which is often fragmented, anecdotal, or linked to a specific project. The model sends a clear demand signal for national NCA accounts.

2. Provide data

National NCA requires all manner of data, on ecosystem state, pressures, as well as information to value assets and their services⁴¹. Businesses can act as providers of information, particularly in specialist business areas where they have access to valuation data (Box 6), or where they have undertaken their own assessments of habitat extent and condition (Box 7).

Care is needed. For instance, lots of data will carry legal restrictions or commercial sensitivity, particularly spatially-linked ecosystem data, which could link assets / practices to companies. However, the sheer volume of input data and estimations required for national NCA means businesses play a vital role in plugging information gaps ahead of wider nature KPI disclosures (e.g., TNFD) becoming a standardized norm.

Box 6: Zillow: providing land value data for US land accounts

Zillow, an American tech real-estate marketplace company, has access to land valuation data due to its position and activity in the real estate in the sector. It provided this data to the US government for its pilot land accounts, showing how bottom-up can support national NCA by providing proprietary data to statistical offices that is not available in the public domain⁴².

⁴¹ Such as market prices, shadow prices, and proxies.

⁴² Wentland et al (2020), *Accounting for land in the United States: Integrating physical land cover, land use and monetary valuation*.

Box 7: Burt's Bees: Data on pollinators

Companies often have detailed datasets which could improve national NCA by plugging data gaps. For instance, Burt's Bees, a cosmetics and skin care business, is dependent on pollinators for the raw ingredients in their products. The company alongside partners managed this dependency by planting over 15 billion wildflower seeds, improving pollinator habitat over almost 60,000 hectares of farmland⁴³. These exercises generate useful on-the-ground ecological data, which some have suggested could help refine the US's national pollinator accounts alongside other techniques⁴⁴.

3. Establish credibility

Two reasons undermine NCA's methodological credibility. The first is confusion about how NCA sits alongside other environmental assessment tools. For instance, governments use tools like life cycle assessments or productivity modelling, sometimes in combination, regularly or in one-off analyses, to measure the state of their impact on the environment. The sheer range creates problems for NCA, to the extent that policy makers reportedly struggle to understand how to combine NCA with existing methods⁴⁵.

The second reason is methodological challenges. Valuing nature on monetary terms is challenging, limiting NCA's use in mainstream accounting. It is likely this will ease as new tools and solutions emerge; for instance, the Capital Coalition's 'Value Commission' may prove critical in helping develop clear and transparent global criteria on the creation and use of value factors for us by businesses, governments, and financial institutions⁴⁶. But for now, it universally slows NCA's use across the 'top' and the 'bottom'.

The 'bottom' can help here. Using NCA in analyses, even in the face of challenges, improves its methodological credibility, creating confidence around its use. It can tackle both the above issues respectively by:

- **Acting as an organizing framework for environmental analyses:** NCA isn't in competition with other methods because it is more an accounting framework rather than a measurement tool (Box 8). Instead, NCA requires other tools to measure and value nature via estimates and proxies.
- **Ironing out methodological creases:** Only by using NCA in practice can practical methodological issues be teased out, through what McKinsey terms an 'iterative test-learn-refine' approach. The top-down has proved cumbersome so far, and it is unlikely governments are agile enough to innovate on NCA.

⁴³ Burt's Bees (2021), *Sustainability Report*.

⁴⁴ Warnell, K. et al (2020), *Accounting for land in the United States: Integrating physical land cover, land use, and monetary valuation as mentioned in Ingram, C. et al (2022), Opportunities for businesses to use and support development of SEEA-aligned natural capital accounts*.

⁴⁵ Recuero Virto, L. et al (2018), *Natural capital accounts and public policy decisions: Findings from a survey*.

⁴⁶ See Capitals Coalition (undated), *The Value Commission*.

Box 8: Case study: BHP's targets

BHP, a diversified mining company, has a target to have 30% of land and water under its stewardship covered by either conservation, restoration, or regeneration practices by 2030.

As part of the commitment, BHP trialed the first natural capital accounting exercise in the mining sector. It helps provide a stronger case and evidence base for the target, because it revealed additional benefits that were previously unknown in relation to the rehabilitation design of a closed mineral sands site, such as improved water quality downstream of the site, and net carbon sequestration gains. The natural capital accounting case study showed that natural assets (water, carbon, biodiversity) and the ecosystem services they provide can be represented on a balance sheet, which could be used to inform decision-making⁴⁷.

4. Ensure future sustainability reporting is fit-for-purpose

Current sustainability reporting has well known problems. Some of these are general to reporting. For instance, few standardized metrics and data presented in unlike tables makes it hard to compare firms, even in the same industry. Similarly, sustainability disclosures rarely link sustainability information to financial reporting, making it hard to judge bottom-line materiality. Other issues are specific to nature disclosures: many firms report their impact on biodiversity through metrics like water consumption, but few report their dependence; even fewer report their positive impact on the environment.

Done right, NCA can iron out these issues. As an accounting framework, it forces information to be presented and organized in similar, monetized ways, putting sustainability impacts in a common language. This allows apples-to-apples comparisons of the tradeoffs between unlike sustainability impacts. Companies experimenting with Environmental Profit and Loss accounts provide insight on how sustainability reporting could look (Box 9 & Box 10).

Box 9: Case study: Sveaskog's net positive Integrated Profit & Loss

Sveaskog, the owner of 14% of Sweden's forests, commissioned GIST Impact to produce an Integrated P&L. The analysis estimated that its net positive natural capital impacts to be around seven times the firm's annual profits, largely because of the significant positive impact of carbon sequestration and water conservation services generated by the firm's forest assets⁴⁸.

⁴⁷ Meney, K et al (2023), *Natural capital accounting for the mining sector: Beenup site pilot case study*.

⁴⁸ GIST Advisory (2017), *Sveaskog Integrated Profit & Loss*.

Box 10: Case study: Forico's exemplary Environmental Profit & Loss

Forico, an Australian plantation forestry company, produced Natural Capital Reports with including a Natural Capital Balance Sheet and Environmental Profit & Loss for the financial years that ended in June 2020, 2021, and 2022. While a few companies have done these, what marks Forico apart from others is the leadership they have shown in setting future reporting expectations and their use of the information:

- The analysis was designed around SEEA EA and The Capital Coalitions' Natural Capital Protocol, clearly linking 'bottom-up' efforts to frameworks guiding 'top-down' national NCA.
- The company explicitly states that it intends to update and improve the reports over time as data sources, methodologies and standards evolve. Whilst Natural capital projects by corporates are often 'one-and-done' studies, mainstreaming NCA requires studies to be published in sync with financial reporting cycles, to generate regular data over time to study real-time impacts, dependencies, and trends to meaningfully influence decision making.
- The company is planning to set and report targets based on their natural capital accounts to guide future report iterations from 2023.

5. Innovate and standardize

Like all accountancy, NCA is neither a perfect science nor a finished product. Hidden in the detail are estimates, proxies and assumptions—all the ingredients that make reporting possible. SEEA even explicitly asks countries take their own initiative on NCA measurement and valuation based on local circumstances, inviting innovation.

The key difference between the two is that accountancy enjoys relatively standard methods for plugging gaps with estimates and assumptions, making comparison across financial reporting possible.

NCA does not have these standard tools yet⁴⁹. The few NCA analyses done today use unlike methods and assumptions, even for similar studies done in the same sector, making reading across reports (peer comparison) impossible. Further, as practitioners innovate more on NCA, there is a danger that already unlike methods and assumptions diverge further, worsening the existing diffusion.

Some data intermediaries offer tools to plug these gaps (see Box 11). These allow cross-company comparisons in the absence of widespread corporate NCA (which generally takes three years from beginning work to disclosure), providing crucial stopgap solutions for financial institutions to value the impact of their downstream value chains. Ultimately, widespread and standardized corporate NCA is required to properly integrate nature into decision-making throughout the economy.

To tackle this, the bottom-up needs to continue innovating while promoting standardization by experimenting *within* standard accounting frameworks (Box 12). The effect would be to promote standardization in reporting without suffocating methodological innovation, taking NCA one step closer to becoming a mainstream framework.

⁴⁹ Notably there have been recent advances for companies to set Science-based Targets for Nature, with recent methodologies available for freshwater and land.

Box 11: Plugging gaps through intermediaries

Financial institutions require corporate NCA assessments to do their own NCAs, because their dependence on nature is through financial products. However, even if it popularized overnight, corporates generally take three years from beginning to disclosure to complete an NCA, limiting NCA's use in finance.

Addressing this gap, innovative 'intermediary' players like GIST Impact and S&P Trucost offer data and analytics to estimate the value of corporate environmental impacts. This helps 'get the ball moving' on financial sector impact valuation, allowing comparisons between firms today while possibly also motivating companies to do their own NCA to avoid their stakeholders relying on intermediaries to evaluate attractiveness.

For instance, United Parcel Service (UPS) is helping to plug methodology and data gaps by providing Small and Medium Businesses (SMBs) with a free environmental impact valuation tool, as part of a 'Green Exporters Program'⁵⁰. The tool is in partnership with intermediaries, including GIST Impact (data and analytics) and ICC Certification (assurance). Large corporates are likely to adopt NCA first, making UPS' program novel for focusing on SMBs, in effect targeting the bottom-most of bottom-up organizations.

Box 12: Case study: Using Switzerland's Eco-points within an NCA framework

Firms can innovate within standard accounting frameworks by using existing tools to plug gaps.

For example, the Transparent Project's Natural Capital Account Methodology (NCMA)—a recent common corporate standard for NCA—provides companies with the flexibility to use their own initiative on data. Often data is not available on granular-enough scales for corporate-level NCA, requiring pragmatic shortcuts, such as using national averages instead.

Companies could use existing national environmental data in their NCA exercises, refining NCA methodologies within existing frameworks. An example is Switzerland's 'Eco-Factors', a set of officially-endorsed coefficients for calculating the net environmental impact of a wide range of economic activities⁵¹. The Eco-Factors can plug into a wide range of NCA analyses, and due to their government origin they are likely to be seen as credible shortcuts before better data emerges—facilitating standardized NCA today while sending signals of demand for national NCA data.

⁵⁰ UPS (2023), *UPS is supporting a greener supply chain*.

⁵¹ FOEN (2021), *Swiss Eco-Factors 2021 according to the ecological scarcity method*.

3.4. The road ahead

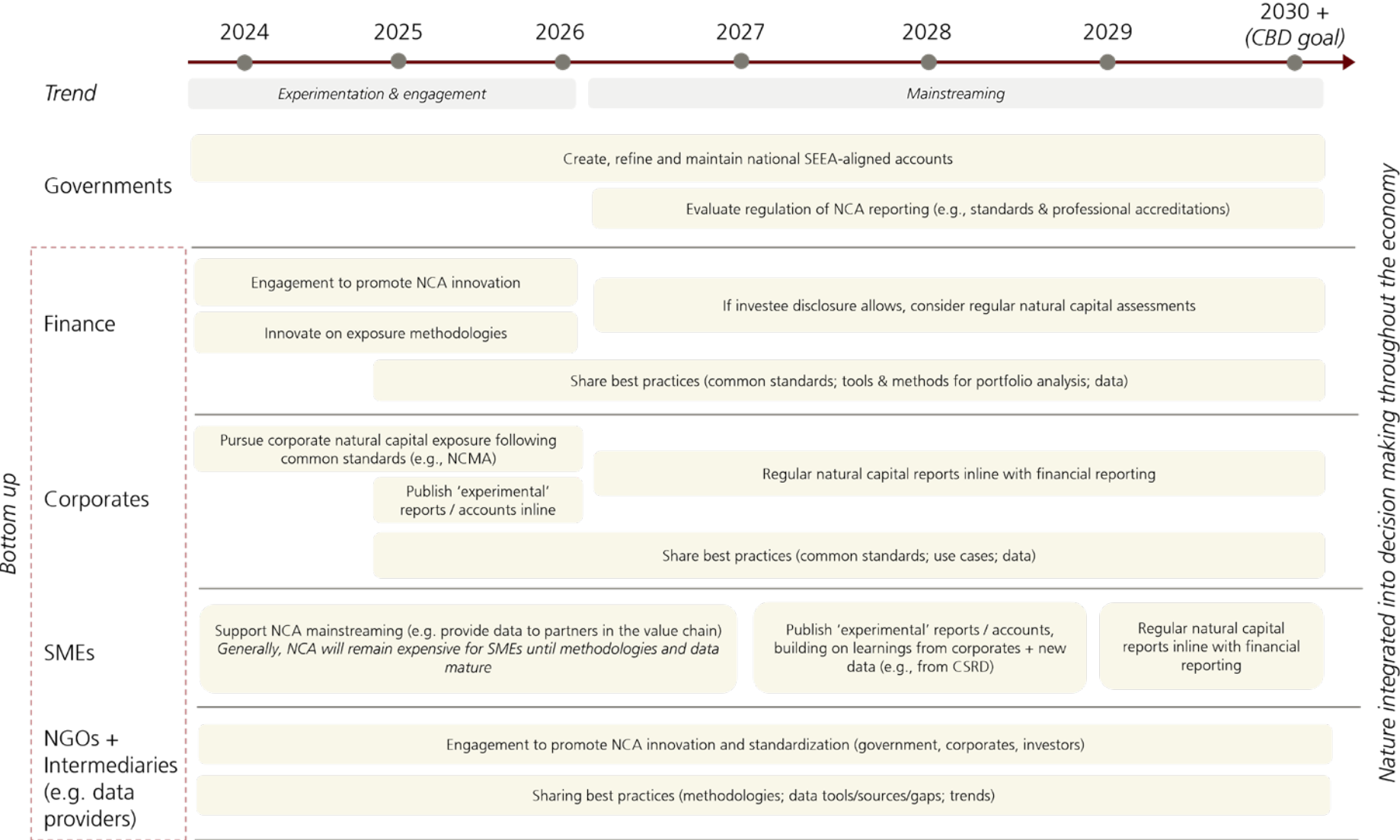
Taking these strategies forward, an idealized path to mainstream NCA involves key actions across corporates, investors, NGOs and governments (Figure 4):

- **Corporates and SMEs** proactively experiment and publish NCA assessments (which takes about three years from start to disclosure), laying the groundwork for regular and standardized reporting closer to 2030;
- **Finance** supports companies in their efforts to use NCA while performing their own assessments—possibly drawing upon data intermediaries to assist prior regular, comparable and widespread investee disclosures taking off;
- **NGOs and Intermediaries** play a facilitatory role as they do today, engaging with all actors and to promote best practice, share learnings and provide stopgap solutions;
- **Governments** continue to implement and create SEEA-aligned accounts (likely beyond 2030, given the US's 2035 deadline) and consider regulatory needs if regular NCA takes off at the corporate level.

[to see **Figure 4** please go to the next page]

Figure 4. Idealized path to mainstreaming NCA, involving corporates, finance, NGOs, and governments.

The below represents a 'best case' roadmap. In reality, the road may be bumpier, as corporates and financial firms continue firming up nature KPI reporting until the mid- to late-2020s—a necessary precursor to bottom-up NCA—pushing widespread NCA reporting beyond 2030.



Source: UBS.

Nature integrated into decision making throughout the economy

4. Summing up

The world does not have the luxury of time. With just seven years left, the CBD's 2030 goal seems increasingly optimistic.

If we are to have any hope of meeting this deadline, or at least coming close, we need to integrate the value of nature into the decision-making throughout the economy.

Natural capital accounting offers a potential solution, but top-down efforts to date have been too slow to develop at scale, generating little if any impact. The core message of this paper is that NCA will only work if private sector organizations—investors, corporates, NGOs, and others—work proactively to incorporate it into their accounting efforts and find ways to bypass its current weaknesses.

There are three key takeaways:

- **Don't wait for NCA to emerge.** After almost six decades of development, the framework remains too niche to meaningfully contribute to the CBD's 2030 goal. Players at the bottom need to develop NCA's nascent methods and data, as they normalize its use.
- **Promote best-practice.** We don't just need more NCA, we need better NCA. The best way to promote this is to use common standards while sharing best practices.
- **Meet top-down efforts in the middle.** Top-down efforts to create SEEA-aligned accounts remain crucial for mainstreaming NCA. But bottom-up work can help to prove the business case for it today, which would help to speed up this process and ensure future accounts are fit-for-purpose.

NCA is a diagnosis rather than a cure for biodiversity loss. But by ensuring that financial decision-making across the economy properly values nature, NCA can arm governments, NGOs, multilateral institutions, and corporates with the data they need to develop countermeasures.

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