From natural capital accounting to natural capital banking

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Natural capital accounting^{1,2} will confirm what we know – without change we are headed for environmental disaster resulting from economic growth. We propose a Natural Capital Bank, a new institution to help maintain natural capital adequacy and chart a course to a sustainable future via accounting.

In March 2021, the nations of the world adopted standards for natural capital accounting called the [System of Environmental-Economic Accounting](#) (SEEA) Ecosystem Accounting³. Our proposal is to take the next step towards sustainability by institutionalising the management of natural capital by government via accounting through a Natural Capital Bank. Dialogue with our peers about the merits of our proposal has revealed scepticism, raised many questions and shown different understandings about current institutions, why they have failed and how these failures could be addressed. But the problem is generally agreed – without change we are headed for environmental disaster.

To make the case for a Natural Capital Bank, we briefly recap some of what is well-known within individual disciplines, but maybe less well-known to the multidisciplinary readership of *Nature Sustainability*. We acknowledge that more than accounting and banking is needed to achieve lasting change, and that even if our proposal is accepted theoretically by the academic community, adoption by government would nevertheless still require strong leadership and considerable political will.

Natural capital decline and accounting

Natural capital is defined by Bateman and Mace⁴ as: “those renewable and non-renewable natural resources (such as air, water, soils and energy), stocks of which can benefit people both directly (for example, by delivering clean air) and indirectly (for example, by underpinning the economy)”. Managing natural capital is problematic because the responsibility for it is fragmented between nations, within different institutions of governments, or considered the commons⁵. Compounding the problem is that we do not know exactly how much natural capital we have, how much we need, how it is changing, and to what degree, if any, natural capital is substitutable⁶. What we do know is the natural capital balance is declining and that we are approaching⁷ or may have already crossed, some critical ecological thresholds⁸. To address natural capital decline, goals and targets have been set via international agreements like the [Paris Agreement](#) on climate change, the [Convention on](#)

[Biological Diversity](#), and the [Sustainable Development Goals](#). However, we are collectively failing to meet these targets and are currently on track for ecological collapse⁹.

Increasing human consumption (e.g. clearing of forests) and the resulting pollution (e.g. emissions of CO₂), have long been known as the causes of natural capital depletion. To quote Nordhaus and Tobin¹⁰:

“Ever since the industrial revolution pessimistic scientists and economists have warned that the possibilities of economic expansion are ultimately limited by the availability of natural resources and that society only makes the eventual future reckoning more painful by ignoring resource limitations now.”

The pessimists have been proved correct and we are now at a point of painful reckoning and having to make difficult economic and environmental trade-offs. Such reckoning and assessment of trade-offs can be done through natural capital accounting¹¹.

Adoption of SEEA-Ecosystem Accounting was immediately hailed in a [Nature Editorial](#) as a significant step for moving natural capital from theory to practice. Adoption is important as we now have agreement on the way information on natural capital and ecosystem services is counted and organised so that it links directly to the [System of National Accounts](#) (SNA), in a parallel set of physical and monetary accounts. By doing this, the SEEA-Ecosystem Accounting provides a way to integrate ecological information into government decision making by presenting it in a form that is interpretable by the economic institutions which lie at the heart of government – Central Banks, Treasuries and Ministries of Finance.

These institutions rely on the SNA for information. The SNA describes mainstream macroeconomic theory and has evolved since its inception in the 1930s¹², being updated three times, [with another revision underway](#). The SNA is infamous as the source of GDP, an aggregate measure of economic performance. Increasing GDP is often wrongly equated with increasing wealth or welfare. This is widely recognised^{12,13,14} and Dasgupta’s¹⁵ scathing assessment of the deficiencies and use of GDP is the latest manifestation of incorrect use.

To address the weaknesses of GDP, many indicators have sought to go “beyond-GDP” to develop better aggregate measures of economic progress or welfare. Hoesktra¹⁶ identified more than 900 “beyond-GDP” indicators, including [Adjusted Net Savings](#) and the [Human Development Index](#), while there is also 17 [Sustainable Development Goals](#) with 231 indicators. These indicators are disconnected, their use by government is sporadic, and they have been unable to challenge the primacy of GDP or penetrate the existing decision-making institutions of government¹⁶. This is despite GDP being a poor indicator of economic performance or welfare.

Existing institutions and a Natural Capital Bank

The economic institutions at the heart of national governments set priorities and resource the functions of government. Central Banks are one of these institutions and their functions encompass: issuing currency (i.e. bank notes and coins), holding government money, controlling the supply of money, meeting growth, inflation and (un)employment targets, ensuring exchange-rate and financial stability, and regulating banks and others financial intuitions¹⁵, including setting levels of capital adequacy (the amount of money that these intuitions must hold to withstand losses and reduce the risk of insolvency).

Establishing a Natural Capital Bank would be a radical reform modelled on some of the functions of Central Banks. A Natural Capital Bank would supervise or coordinate existing institutions charged with environmental protection and would help manage the natural capital of the nation and ensure its environmental stability on behalf of society, as a Central Bank helps manage the economy, ensures financial stability and set the rules for capital adequacy.

Natural capital represents a portfolio of asset classes based on ecological characteristics. A key function of the bank would be to set the levels of natural capital adequacy – the amount of natural capital needed to withstand unexpected losses and to prevent ecosystem collapse. The levels, which represent ecological thresholds, would be set by the best available scientific evidence. This evidence will be imperfect, and the levels would change with evolving understanding of thresholds, the risk of crossing thresholds, and the substitutability of assets. In the absence of sufficient evidence for establishing thresholds, levels of natural capital adequacy would initially be set to protect the existing natural capital – a default to the notion of strong sustainability¹³. Where evidence is available that we are above thresholds, risks are low or there is substitutability, the bank would release this natural capital for use, subject to development approvals. This is akin to weak sustainability¹³.

Natural capital adequacy levels might be set by law. For example, Nationally Determined Contributions (NDCs) under the Paris Agreement might be enshrined as a legislative direction to the bank, just as some countries set statutory inflation parameters.

A Natural Capital Bank would use accounts to review the impact of decisions and enable adaptive natural capital management. If the natural capital balance is below or headed towards set thresholds or targets, then the bank must take measures to maintain or increase the balance above the thresholds or targets. To do this, a notice of natural capital deficiency could be issued to government, which would then be responsible for negotiating a restoration plan with the bank. The bank would need to have realistic expectations about the timeframe for restoration, including considering the capacity to pay (e.g. in an economic recession, restoration time could be extended). The bank also would need priorities and should have the ability to write-off assets that are beyond recovery. As a fail-safe, if government thought that the bank was insisting on unrealistic restoration targets or that assets were being unnecessarily written-off, then it should have a right of appeal to the Parliament as representative of society (the ultimate owner of the natural capital managed by the bank).

Steps to change

While a Natural Capital Bank is a radical proposition, there is already evidence of steps in this direction. Governments have established trusts to manage natural capital assets. Examples from Australia, our own country, include the [Commonwealth Environmental Water Holder](#) and the New South Wales [Biodiversity Conservation Trust](#). A Natural Capital Bank would oversee and coordinate natural capital adequacy rules for agencies like these.

We also see evidence of institutional reform and a move from an “accounting push” to a “policy pull” from government¹⁷. The “policy pull”, is coming from economic institutions at the heart of decision-making in some countries. For example, the United Kingdom established a [Natural Capital Committee](#) in 2012 to advise government. This was replaced in March 2021 by an (currently interim) independent [Office for Environmental Protection](#), to oversee implementation of the government’s [25 Year Environment Plan](#). In addition, the United Kingdom Treasury commissioned the Dasgupta Review¹⁵ and the Bank of England recognises climate change as a risk¹⁸. Most recently, the UK took its leadership in this area

further through their chairing of the [G7 in June 2021 by placing climate change, together with biodiversity and natural capital loss, high on the agenda](#), the latter supported by a special report prepared by the OECD¹⁹. The creation in 2017 of the [Network for Greening the Financial System](#) (NGFS), involving the Central Banks of many countries, which recognised climate change as an economic risk and recommends action²⁰ is another sign of the desire for institutional reform.

A Natural Capital Bank would provide a focus for institutional reform. It would help ensure that the agencies responsible for natural capital management are not marginalised and given real power and resources to halt or reverse the natural capital decline driven by economic growth imperatives overseen by Central Banks.

Proposing a Natural Capital Bank prompts many questions. For example: Could the functions of the bank be included in existing agencies and in particular Central Banks? What would be the specific powers and policy instruments of the bank? How would the economic consequences of not releasing or restoring natural capital be managed? How could restoration be funded? To what extent, if any, should current economic agents be held liable for past degradation or depletion? These are economic questions and they logically follow the first proposition: natural capital thresholds have to be set and maintained and these need to be set by scientific evidence. This reverses the current paradigm of economic decisions considering the environment, to one of environmental decisions considering the economy.

For the first question, there are barriers to natural capital being considered by Central Banks. Dikau and Volz¹⁸ reviewed the mandates of 135 Central Banks and found that only 12% had mandates that explicitly included sustainability and another 40% had indirect mandates. The same review also noted that while many Central Banks have begun activities to address climate change, there are limits to what monetary policy can achieve and that the potential role of banks in “greening the economy” is contentious¹⁸. For this and the other four economic questions above, discussion is needed.

We know our vision for a Natural Capital Bank may be politically unattractive. The accounts crystallise the declining state of natural capital and mechanisms to maintain or restore natural capital adequacy would affect many existing interests. Despite this, we argue that natural capital accounting and natural capital accounting are two steps towards a sustainable future and that Natural Capital Bank offers effective institutional reform and could be implemented progressively, e.g. by making the bank’s role initially an advisory one. We make this proposal as part of the sustainability debate because the existing institutions are clearly not working and the longer we delay, the closer we move toward ecological thresholds and the more drastic the action that will be required when the day of painful reckoning arrives.

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