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Recognizing Natural Capital in Policy Frameworks for Green Growth

GGKP Expert Group on Natural Capital
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Alison Fairbrass, Paul Ekins and Ben Milligan

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The Green Growth Knowledge Partnership (GGKP) is a global community of organizations and experts committed to collaboratively generating, managing and sharing green growth knowledge. Led by the Global Green Growth Institute (GGGI), Organisation for Economic Co-operation and Development (OECD), United Nations Environment Programme (UNEP), United Nations Industrial Development Organization (UNIDO) and the World Bank Group, the GGKP draws together over 60 partner organizations. For more information, visit www.greengrowthknowledge.org.

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The Green Growth Knowledge Partnership (GGKP) convenes inter-institutional expert groups to identify and address critical knowledge gaps in green growth theory and practice. The neutral, collaborative expert groups focus on knowledge generation, synthesis and on-the-ground application by partners and in-country stakeholders.

This report was prepared under the guidance of the GGKP Natural Capital Expert Group (hereinafter "Expert Group"). The Expert Group aims to push the knowledge frontier, mainstream natural capital in global green growth activities and support stronger implementation of natural capital commitments in national economic plans. In its deliberations, the group identified a key knowledge gap in the provision of natural capital data to inform national green growth plans.

To clarify this gap and identify pathways to address it, the Expert Group, with support from the GGKP Secretariat, commissioned the University College London (UCL) to prepare this report. This publication was produced with Expert Group guidance and synthetic research by Alison Fairbrass (UCL), Paul Ekins (UCL) and Ben Milligan (University of New South Wales).

The Expert Group was led by Co-Chairs Paul Ekins (UCL Professor and Director of the Institute for Sustainable Resources) and Joe Grice (Chairman of the United Kingdom Office for National Statistics Economic Experts).

The Expert Group is composed of members from various organizations, including Charles Akol (United Nations Economic Commission for Africa), SoEun Ahn (Korea Environment Institute), Alessandra Alfieri (United Nations Statistics Division), Carter Brandon (World Resources Institute), Raouf Dabbas (Jordan Friends of Environment Society), Gitika Goswami (Development Alternatives), Salman Hussain (UNEP The Economics of Ecosystems and Biodiversity), Katia Karousakis (OECD), Pushpam Kumar (UNEP), Glenn-Marie Lange (World Bank Group), Markus Lehmann (Convention on Biological Diversity), Anil Markandya (Basque Centre for Climate Change), Geoff McCarney (Smart Prosperity Institute), Edwin Muchapondwa (Environment for Development Initiative), Rosimeiry Portela (Conservation International), Mary Ruckelshaus (Natural Capital Project), Oyun Sanjaasuren (Green Climate Fund), Mark Schauer (Economics of Land Degradation (ELD) Initiative/Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)), Tim Scott (United Nations Development Programme), Juha Siikamäki (International Union for Conservation of Nature), Kevin Urama (African Development Bank), Annawati van Paddenburg (GGGI) and James Vause (UNEP-World Conservation Monitoring Centre).

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EXECUTIVE SUMMARY

At its 2017 annual meeting, the Green Growth Knowledge Partnership (GGKP) Expert Group on Natural Capital identified the need for an integrated, inter-institutional integration framework for mainstreaming natural capital into green growth policymaking and economic development more generally. This paper responds to this need, documenting the results of three research activities undertaken by the University College London (UCL) on behalf of the GGKP Natural Capital Expert Group in 2018–2019.

First, a broad review was conducted of 11 policy advisory and assessment frameworks concerning green growth published by a range of international and non-governmental organizations. Selected frameworks are reviewed, in terms of their focus and structure, and strengths and weaknesses concerning the extent to which they specifically and explicitly address the topic of natural capital (see **Section 2**).

Second, this was followed by the development of a detailed "checklist" of criteria for assessing how the concept of natural capital is integrated into relevant policy frameworks (see **Section 3**). These criteria are synthesized from relevant components of international policy frameworks and design features of national policy reforms concerning natural capital.

Third, using the checklist criteria, a detailed assessment was conducted of policy frameworks developed by GGKP member organizations, namely the Global Green Growth Institute (GGGI), Organisation for Economic Co-operation and Development (OECD), United Nations Environment Programme (UNEP) and World Bank (see **Section 4** and **Appendix A.1**).

The principal findings of the paper can be summarized as follows:

F1. Natural capital—in particular ecosystem assets and associated services—is not yet a common cross-cutting focus of international policy frameworks for green growth.

These frameworks are structured heterogeneously around either policy instruments, processes, models of capital and models of change, international targets and national priorities. The concept of natural capital is integrated to varying degrees in these frameworks, with some frameworks using it as an explicit element of the framework, and others mentioning the concept but not using it as a prominent theme. There is an immediate opportunity to broaden the scope of natural assets considered by green growth policy frameworks from commodity assets (such as timber, minerals and agricultural products) to include ecosystem assets and ecosystem services.

F2. Green growth policy frameworks can be assessed in terms of the extent to which they recognize natural capital as a foundation of development, as assets with specific abiotic and ecosystem components, and as a specialist focus of policy options and instruments.

The diversity and use of natural capital policies at the national scale are proliferating globally, with countries adopting a wide range of policy options that span government decisions, natural assets and industry sectors (see **Appendix A.2**). In **Section 3,** we present an integration framework (see Table below) for mainstreaming natural capital in green growth policymaking:

Integration framework for mainstreaming natural capital in green growth policymaking	
Overarching goal	
1.1	The concept of capital. Is the environment, including ecosystems, recognized as a capital asset that provides flows of benefits to human society and the economy?
Components of natural capital*	
2.1	Does the policy framework address all components of natural capital? This includes assets (e.g. ecosystem and commodity assets), flows (i.e. ecosystem services), human inputs to the environment (e.g. investment and employment) and outputs (i.e. benefits derived from and residual impacts on natural capital).**
2.2	Are commodity natural assets considered comprehensively? Assets do not need to be defined specifically, but could include using a typology of assets such as those defined in the System of Environmental-Economic Accounting – Central Framework *(1)*, e.g. minerals and energy, land, soil, timber, aquatic resources, other biological resources and water.
2.3	Are ecosystem assets considered comprehensively? Ecosystem assets do not need to be defined specifically, but could include using an ecosystem typology, such as the WWF Ecoregions system*** *(2)*, to guide the consideration of all ecosystem assets that exist in a country/region.
2.4	Are flows from natural capital considered comprehensively? Flows do not need to be defined specifically, but this could include using an ecosystem services typology, such as the Common International Classification of Ecosystem Services *(3)*.
Policy elements	
3.1	Have policies relevant to the extent, quality and economic value of natural assets been considered in the framework?
3.2	Have policies relevant to biophysical flows from natural capital been considered in the framework?
3.3	Have policies relevant to economic (e.g. investment in realizing benefits from natural capital) and social (e.g. employment) inputs been considered in the framework?
3.4	Have policies relevant to the economic (e.g. value added to national accounts of natural capital), social (e.g. population with access to benefits provided by natural capital) and environmental (e.g. emission of residuals to the environment) impacts of realizing benefits from natural capital been considered in the framework?
3.5	Have policies relevant to the governance of natural capital been considered in the framework?
3.6	Does the framework consider policy instruments incentivizing for measurement of natural capital components that are not currently valued in markets in order to internalize externalities?
3.7	Has the monitoring and reporting of policy outcomes and impacts related to natural capital been considered? Have methods to do this been considered?

* In this framework, biodiversity is considered as a characteristic of all ecosystems, which are in the top level of natural capital, rather than as a distinct asset, therefore, biodiversity would be a key indicator of ecosystem asset quality.
** Residuals comprise the flows of solid, liquid and gaseous materials, and energy that are discarded, discharged or emitted by establishments and households through processes of production, consumption or accumulation.
*** WWF defines an ecoregion as a "large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions".

The integration framework is structured in three parts:

1. An overarching goal of recognizing the environment as a capital asset, which provides flows of benefits to human society and the economy
2. The components of natural capital – ensuring the elements of natural assets, flows, human inputs into the environment and outputs are considered
3. Policy elements – ensuring that a comprehensive and appropriate suite of policy instruments are considered

The framework is based on a review of both national natural capital policies and of the green growth policy frameworks from a range of international and non-governmental organizations. The framework can be used by organizations and governments as a checklist to ensure that the concept of natural capital in fully integrated into green growth policy frameworks.

F3. Natural capital offers new options and opportunities for green growth policy frameworks.

In **Section 4**, we test our integration framework by application to the green growth policy frameworks of four GGKP Natural Capital Expert Group member organizations: GGGI, OECD, UNEP and World Bank. Given that all four organizations have published a substantial body of literature detailing their frameworks and the application of their frameworks to national green growth policy assessments as globally leading institutions of green growth, we could identify a number of opportunities for evolving the organizations' green growth work:

F3.1. Considering natural assets and ecosystem services more comprehensively as the ecological underpinning for society and the economy. This could involve consulting typologies of commodity assets (e.g. those defined as discrete assets in the System of Environmental-Economic Accounting – Central Framework (SEEA) (1)), ecosystem assets (e.g. evolving classifications from the SEEA Experimental Ecosystem Accounting and WWF Ecoregions system (2)) and ecosystem services (e.g. the Common International Classification of Ecosystem Services(3)). Reliable access to national natural capital data is a key factor for success.

F3.2. Identifying specific policy instruments appropriate to different types of natural assets and associated services. This could include specific policy instruments for recognizing and measuring the components of natural capital, and associated services, that are not currently valued in markets.

F3.3. Applying a systems approach to policy assessment and advice that considers the relationships and inter-dependencies between natural assets, flows, human inputs into the environment and outputs. These are considered in a separate GGKP working paper that focuses on the development of indicators for natural capital which has been developed for public sector use at the national scale. Further work would be required to address cross-sectoral policy coherence.

F3.4. Monitoring implementation and impact of green growth policies at the national level could be improved through greater provision of methodological advice to country teams during the development of national assessments. This would also support a more robust literature on which policy interventions recommended by international and non-government organizations can be considered best practices for green growth and natural capital.

In **Section 5**, we make a number of recommendations for future work that build on the findings summarized above. In particular, we highlight the importance of ongoing collaborative efforts to:

R1. Communicate the results of our broad assessment of green growth policy frameworks to the organizations working in this area.

R2. Further develop comprehensive and widely acceptable assessment criteria for mainstreaming natural capital into green growth policymaking, and economic policymaking generally, building on the checklist presented in this paper.

R3. Continue discussion of options and opportunities to incorporating the concept of natural capital into relevant policy frameworks of the GGGI, OECD, UNEP, World Bank and others.

R4. Use and extend the catalogue of natural capital policies presented in Appendix A.2 as a knowledge base when delivering green growth policy advice to national and sub-national governments.

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LIST OF ACRONYMS

AfDB	African Development Bank
BAU	Business as usual
CBD	Convention on Biological Diversity
CICES	Common International Classification of Ecosystem Services
eCBA	Extended Cost Benefit Analysis
GEPA	Green Economy Policy Assessment
GGAP	Green Growth Assessment Process
GGGI	Global Green Growth Institute
GGKP	Green Growth Knowledge Partnership
GGPA	Green Growth Potential Analysis
OECD	Organisation for Economic Co-operation and Development
PAGE	Partnership for Action on Green Economy
PES	Payment for ecosystem services
PCSD Framework	Framework for Policy Coherence for Sustainable Development
PES	Payments for Ecosystem Services
SDG	Sustainable Development Goals
SEEA EEA	UN System of Environmental-Economic Accounting – Experimental Ecosystem Accounting
SNA	System of National Accounts
TEEB	The Economics of Ecosystems and Biodiversity
TERI	The Energy and Resources Institute
UN DESA	United Nations Department of Economic and Social Affairs
UNEP	United Nations Environment Programme
WWF	World Wildlife Fund

SECTION 1. **INTRODUCTION**

Social and economic development depends on the sustainable management of natural capital. Natural capital is the stocks of natural assets, such as ecosystems, their discrete components such as minerals and water, and the life they support. Natural capital also provides services such as sustaining air, water and soil quality, climate regulation, pollination and disaster risk reduction. Often in conjunction with other capital inputs, humans derive benefits such as food, energy and medicine from these assets and services. These benefits are essential for human existence, maintaining a good quality of life and are a foundational element of the global economy. For example, more than 2 billion people rely on wood fuel to meet their primary energy needs *(4)*, fisheries and aquaculture currently generate US$252 billion annually *(5)*, and more than 75 per cent of global food crop types rely on animal pollination *(4)*. Most natural assets and flows of benefits are not fully or at all replaceable.

Global trends in nature, including the integrity and functions of ecosystems, are declining and are projected to continue to 2050 and beyond, due to the projected impacts of increasing land and sea-use change, exploitation of organisms and climate change *(4-6)*. Despite increasing implementation of policy responses to manage natural capital more sustainably, and innovation and effort in advancing policies, the efforts and effects to date remain insufficient *(4, 5)*. It is likely that only one in five of the strategic objectives and goals across six global agreements[1] relating to nature and the protection of the global environment are demonstrably on track to be met *(4)*. There needs to be improved implementation of policy responses for managing natural capital to avoid irreversible impact on ecosystems, human health and economic costs.

Natural capital is relevant to a number of international commitments on sustainable development and climate change, including the 2015 Paris Agreement on Climate Change *(7)*, Convention on Biological Diversity *(8)*, Sendai Framework for Disaster Risk Reduction *(9)* and other multilateral agreements concerning the environment. Major changes are needed to recognize and account for natural capital in economic decision-making, which is reflected in the 2030 Agenda for Sustainable Development *(10)*. The concept of natural capital is not explicitly mentioned in the Agenda, but several parts of it do address the topics of natural capital in substance, and recognize that the environment as a foundation of economic development, for example the following commitments:

- **The preamble of the 2030 Agenda:** which recognizes that "social and economic development depends on the sustainable management of our planet's natural resources".
- **SDG Target 12.2:** which calls on all countries, by 2030, to "achieve the sustainable management and efficient use of natural resources".
- **SDG Target 8.4:** calling on all countries to "improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead".
- **SDG Target 15.9:** which calls on all countries, by 2020, to "integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts".
- **SDG Target 17.19:** calling on all countries, by 2030, to "build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries".

The SDGs "wedding cake" (Figure 1) schematizes the environment as a foundation of economic development recognized in the preamble the 2030 Agenda and clearly implies that economies and societies are seen as embedded parts of the biosphere (*11*).

1 The Convention on Migratory Species (CMS), Convention on International Trade in Endangered Species (CITES), International Plant Protection Convention, United Nations Convention to Combat Desertification (UNCCD), Ramsar Convention on Wetlands and World Heritage Convention.

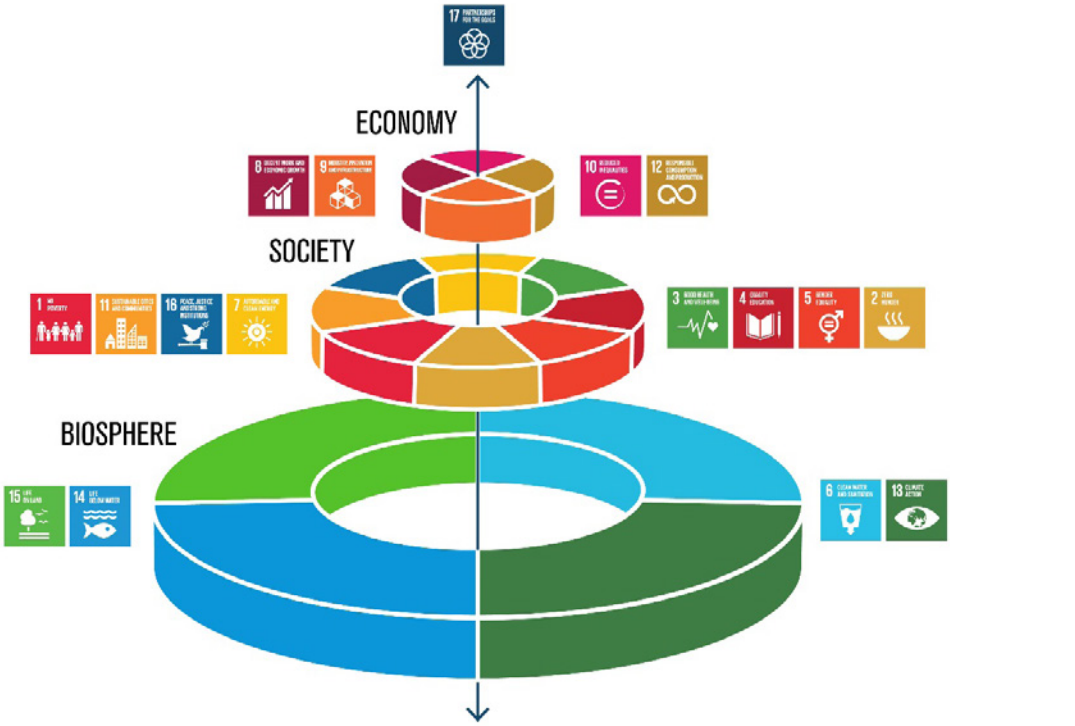

Figure 1. The SDGs "wedding cake" (*11*)

The international community has now broadly committed to advancing a natural capital approach through these international commitments.

Green growth is a response to the need to recognize and account for the environment in economic decision-making. Green growth can be defined as economic growth that is characterized by certain environmental conditions and consequences, as a subset of sustainable development. A number of international organizations and non-governmental organizations have developed guidance, including policy frameworks, to support national and sub-national governments towards a green growth trajectory. For example, the Organisation of Economic Co-operation and Development (OECD) and World Bank have produced green growth policy frameworks *(12, 13)* while the Global Green Growth Institute (GGGI) and the United Nations Environment Programme (UNEP) have developed guidance and tools for national green growth assessment *(14, 15)*. These frameworks and tools have been applied in numerous national contexts to assess and guide national governments in developing green growth policy strategies.

Nevertheless, the concepts of green growth and natural capital are often not well integrated into national economic and sustainable development plans. There is recognition of the environment as an important element of economic growth, development and human well-being in some national economic and sustainable development plans and strategies. For example, in the Philippines Development Plan the environment is explicitly described as a foundational element of development *(16)* and the Myanmar Sustainable Development Plan describes ecosystems as sustaining growth if managed correctly *(17)*. However, there is very little integration of the environment into national goals, objectives and policies of economic development in other national plans. For example, the economy and the environment are treated separately in national economic and sustainable development plans and strategies of South Africa *(18)*, Nigeria *(19)* and Lao *(20)*. This suggests that the concept that has been adopted in international commitments of natural capital as essential to social and economic development is not yet being integrated into economic development planning at a national level to a great extent.

How well the concept of natural capital is integrated into existing green growth policy frameworks has not yet been comprehensively assessed. Natural capital underlies green growth and is vital for resilience *(13)*. However, natural capital is typically treated as one of multiple elements of green growth alongside elements such as health, jobs and technological innovation (see the GGKP web platform for an overview of common green growth topics at https://www.greengrowthknowledge.org/theme). Evaluation by the OECD of the implementation of their green growth framework identified bias in national policy frameworks towards some common themes such as climate change, and away from less common themes such as biodiversity and water *(21)*. To address current and future national and global environmental challenges, it is critical that the concept of natural capital becomes embedded into national economic plans. Therefore, it is imperative that the concept of natural capital is integrated into the policy frameworks of the international and non-governmental organizations that provide green growth and natural capital policy advice to national and sub-national governments.

Here we present a number of research products to help meet this challenge. First, we provide a broad review of the green growth policy frameworks of the international and non-governmental organizations that provide green growth and natural capital policy advice to national and sub-national governments. We interrogate the strengths and weaknesses of these frameworks in terms of their structure and their integration of the concept of natural capital. Second, based on this review, we develop a set of criteria to assess how the concept of natural capital is integrated into policy frameworks. Third, using these criteria, we assess in depth the green growth policy frameworks from four GGKP Natural Capital Expert Group member organizations: GGGI, OECD, UNEP and World Bank. Based on this assessment, we provide recommendations for how natural capital can add value. Finally, based on this review of green growth and natural capital policy literature, we present a structured catalogue of natural capital policy instruments. This can be used by national governments to understand what natural capital policy options are available in relation to different types of common government decisions.

SECTION 2. BROAD REVIEW OF GREEN GROWTH POLICY FRAMEWORKS

A suite of international and non-governmental organizations have developed frameworks to provide green growth and natural capital policy advice to national and sub-national governments (Table 1). These include the OECD, World Bank, GGGI and relevant UN agencies. The frameworks reviewed here have been identified through consultation with the GGKP Natural Capital Expert Group. They represent the diverse group of actors that currently provide influential advice on national green growth and natural capital activities.

A range of different methods are used to structure the different elements of these frameworks. A common method of structuring frameworks is around **types of policy instruments** *(12, 22)*. This has the advantage of being explicit about what policy tools are available to countries and what issues they could be applied to. However, many policy instruments are not easy to apply to natural assets and ecosystem services, the majority of which do not have market prices.

The World Bank structures its six-part framework around a **three capitals model** and three broad types of policy instruments *(13)*. This has the advantage of being explicit about which policy instruments can be applied to specific types of natural capital. A framework specific to water assets takes the approach of structuring policy recommendations around state-driven, market-oriented and community-centred policy mixes *(23)*.

Other frameworks are structured around the **process of moving towards green growth** and include tools to support this process. The GGGI proposes an eight-step Green Growth Assessment Process (GGAP), which includes the application of cost-benefit analysis to select policies and prioritize projects relevant to the national context *(14)*. UNEP's target-driven Green Economy Policy Assessment (GEPA) is structured around a five-step process, which is supported by the use of modelling and indicators *(15)*. UNEP argues that a process-based approach is more general than a policy instrument-based approach so can be more easily applied to different national contexts. Other less common approaches to structuring frameworks include **SDG Targets** *(24)*, **levers of change** for government policy action on natural capital *(25)*, and **principles, priorities and pathways** for developing green economies *(26)*. Finally, national green growth assessments tend to be structured around **national priorities** related to industrial sectors, types of natural assets, types of capital, processes and environmental issues *(27, 28)*.

The concept of natural capital is incorporated to different degrees in these frameworks (Table 1). On one end of this spectrum, the World Bank uses the concept as an organizing theme to structure its framework, and discusses policy approaches in relation to specific types of natural assets *(13)*. The concept is also a central theme in the frameworks from GGGI *(14)* and the Natural Capital Coalition *(25)*. The national green growth assessments focus on specific types of natural capital that are relevant to their national context *(27, 28)*. On the other end of this spectrum, the concept of natural capital is mentioned but is not a prominent theme in the frameworks from UNEP *(15)* and the Partners for Inclusive Green Economy *(26)*, which provides an opportunity to strengthen the integration of natural capital into these frameworks.

Between these two extremes lies the toolkit from the African Development Bank, OECD, UN and World Bank *(22)*, which discusses environmental assets but not in terms of their role in supporting the economy. The UNDESA framework *(24)*, which is structured around the SDG Targets, includes the concept of natural capital implicitly through the recognition by the 2030 Agenda for Sustainable Development of the environment as a foundation of economic development. Where specific types of natural assets are discussed in the frameworks reviewed, this tends to focus on the commodity assets that are included in the System of National Accounts (e.g. timber, energy, minerals and agricultural products), and there is an opportunity to broaden the scope of natural assets to include the ecosystems that produce these commodity assets (e.g. forests). Across the frameworks, there is also an opportunity to more fully adopt the concept of flows of benefits from natural capital (e.g. ecosystem services).

Table 1. Green growth policy frameworks from international organizations and non-governmental organizations.

Frameworks are described in terms of their structure of elements, strengths and weaknesses, and comparison between frameworks.

Framework	Purpose	Structure	Strengths and weaknesses	Integration of the natural capital concept
OECD (2011) Towards Green Growth *(12)*	The Green Growth Strategy provides concrete recommendations and measurement tools to support countries' efforts to achieve economic growth and development, while at the same time ensure that natural assets continue to provide the ecosystem services on which our well-being relies. The strategy proposes a flexible policy framework that can be tailored to different country circumstances and stages of development.	Organized around a classification of environmental policy instruments, including cap-and-trade permit systems, baseline-and-credit permit systems, taxes or charges on pollution or resource use, taxes or charges on a proxy, subsidies, deposit refund schemes, performance standards, technology standards, active technology support policies and voluntary approaches.	The granular range of instruments is well suited to informing action within economic and finance ministries and other institutions with policy design authority. It is less suited to where instrumental reform is not contemplated. Absence of detailed treatment of natural capital (see right).	A strong focus on market instruments which speak to economic decision-makers and heads of state, but which may not be easy to apply where natural assets and ecosystem services flows lack market prices. Natural assets are mentioned in relation to the tragedy of the commons. Given that statistical measurement of flows and benefits from natural capital is not yet sufficiently advanced, they are not in full consideration in policy development and evaluation.
World Bank (2012) Inclusive Green Growth: The Pathway to Sustainable Development *(13)*	The World Bank provides step-by-step guidelines, including a checklist, to help analysts and decision-makers structure the process of crafting green growth strategies.	Uses a three capitals model of human, natural and physical capitals to organize half of its policy framework, with the other half of the framework being structured around types of policy instruments.	Explicit focus on natural capital with policy recommendations for specific natural assets. The World Bank advances on the OECD's work by discussing specific policy instruments in relation to different types of natural assets and flows of benefits.	Discusses both stocks and ecosystem services. Discusses specific policy instruments in relation to different types of natural assets and flows of benefits, such as defining property rights for forests, promoting integrated landscape approaches for agriculture, and creating markets for the economic valuation of non-provisioning ecosystem services. There is a focus on the natural capital assets that are included in the System of National Accounts (SNA) such as timber and minerals.

Framework	Purpose	Structure	Strengths and weaknesses	Integration of the natural capital concept
African Development Bank, OECD, UN, and World Bank (2013) A Toolkit of Policy Options to Support Inclusive Green Growth *(22)*	This report presents a framework to help develop inclusive green growth strategies, an overview of some of the key tools that specifically address the challenges raised by making growth green and inclusive, and a brief discussion of knowledge sharing and capacity building challenges and solutions.	The toolkit is structured around a typology of tools and their functions: tools for pricing pollution and natural resource use (e.g. environmental fiscal reform and charges, PES); tools to complement pricing policies (e.g. sustainable public procurement); tools to foster inclusiveness (e.g. social protection instruments, PES); tools to manage uncertainty (e.g. certification for sustainable production); financing and investment tools (e.g. green innovation and industrial policies); and monitoring tools (e.g. green accounting).	The tools described in the toolkit are mostly conventional tools such as environmental fiscal reform and social protection instruments. What is new is that they are brought together and are all being assessed according to their economic, social and environmental implications. A July 2013 update includes two new tools on climate change and energy respectively and an updated tool on water.	Discusses environmental assets, particularly in relation to accounting. It does not discuss the underpinning of the economy by environmental assets.
UNEP (2014) Green Economy Toolkit for Policymakers *(15)*	A three-report package which provides customized guidance on how to conduct a target-driven Green Economy Policy Assessment (GEPA) in order for policymakers to develop and adopt green economy policies to achieve their sustainable development targets. There is focus on the use of modelling and indicators to support the GEPA.	The GEPA is structured around a five-step process: establishing priority sustainable development targets based on the overall development plans of countries; estimating the amount of investments required to achieve the targets; identifying the policies or policy reforms that are essential for enabling the required investments; assessing the impacts of the required investments as well as the enabling policies using a range of economic, social and environmental indicators and comparing the results with the business-as-usual scenario; and presenting the assessment results to inform the making of specific decisions. Also provides review of relevant policy instruments structured around broad policy areas including public expenditure, trade policy, regulatory measures, skills and human capacity measures, and social protection measures.	This is a process-based policy-setting framework whose flexibility allows it to be applied in different developing country contexts. It does not provide a structure for selecting specific policies because these will be context specific.	The term natural capital is used in this report, but the concept is not a major theme. Natural assets and ecosystems are discussed, but the concept of ecosystem services is not included.

Framework	Purpose	Structure	Strengths and weaknesses	Integration of the natural capital concept
African Development Bank (2015) Green Growth Mozambique Policy review and recommendations for action *(27)*	An example of the African Development Bank's (AfDB) work in the field of green growth policy assessment. This knowledge product is part of the work undertaken by the African Development Bank in the context of its new Strategy 2013-2022, whose twin objectives are "inclusive and increasingly green growth". The bank provides technical assistance to its regional member countries for embarking on a green growth pathway. Mozambique is one of these countries.	Structures this national green growth policy review around a mixture of industrial sectors, types of natural assets, types of capital, processes and environmental issues. This includes: natural capital, tenure, consultation, agriculture, fisheries, forests, water, energy, cities, green technology, climate resilience, human capital, extractives, economic resilience and catalytic funds.	This offers a strong perspective of the application of green growth in practice, across a range of prioritized national sectors. It is unclear how the elements that are focused on are chosen based on a framework from the AfDB or whether they are chosen due to the priorities of Mozambique.	Explicit focus on natural capital and specific assets, including ecosystem services.
The Energy and Resources Institute and GGGI (2015) Green Growth and Sustainable Development in India Towards the 2030 Development Agenda *(30)*	An example of The Energy and Resources Institute (TERI) and GGGI's work in the field of green growth policy assessment. This is a national green growth policy review. It is composed of a technical report detailing a modelling analysis and a summary for policymakers.	Structures policy recommendations around 19 areas: coal, oil and gas, renewables, transmission grids, power distribution, nuclear, hydropower, transport, electric mobility, financing, buildings, agriculture, clean fuel, air quality, water, forests, biodiversity, waste and irrigation.	As with the AfDB (2015) work above, this offers a strong perspective of the application of green growth in practice, across a range of prioritized national sectors. It is unclear how the elements that are focused on are chosen based on a framework from TERI or GGGI, or whether they are chosen due to the priorities of India.	Focus on specific natural assets and benefits, but not ecosystem services.

Framework	Purpose	Structure	Strengths and weaknesses	Integration of the natural capital concept
K-water Institute and World Water Council (2015) Water and green growth. Beyond the theory for sustainable future *(23)*	This report presents a policy guideline as a tool to implement related water and green growth policies, plans and programmes, based on the evaluation of good practices through an analysis of case studies from countries including the Republic of Korea, Ecuador, India, Spain, Australia, Nepal, China, Brazil, Turkey and Egypt. The report also presents a policy guideline of three water and green growth strategies and associated policy directions.	The report presents particular policy instruments that are associated with state-driven, market-oriented, and community-centred policy mixes. The report frames policy options around three types of policy mix: water as an engine for growth; protection and conservation of water resources; and water for an improved quality of life is focused on the social impacts of water.	In-depth treatment of policy-making related to a specific natural capital asset. Limited consideration of portfolio-based management of multiple assets — e.g. via spatial and strategic planning, resource nexus policymaking, natural capital accounting, etc.	Embraces view that water assets can support green growth. Focuses on the natural asset of water and the policy options available to manage it.
UNDESA (2018) Handbook for the preparation of voluntary national reviews *(24)*	This report provides basic, practical information on the steps that countries may take when preparing voluntary national reviews. It is designed to provide elementary building blocks for a country in the preparation of its reviews.	Structures reviews of national policy frameworks around the SDG Targets.	This is a basic and rapid tool. The review assesses policies based on their title, but this often does not provide much information about what the policy does, the policy effectiveness, or whether it has helped anything towards achieving the SDG Targets.	Limited to the incorporation of the concept in the 2030 Agenda for Sustainable Development, which does not explicitly discuss the concept of natural capital, but several parts of the Agenda do address the topics of natural capital in substance, and recognize that the environment as a foundation of economic development.
GGGI (2018) Green Growth Assessment & Extended Cost Benefit Analysis: A handbook for policy and investment decision makers *(14)*	GGGI presents the Green Growth Assessment Process (GGAP), a tool designed to select policies (macro level) and prioritize projects (micro/project level) to achieve green growth outcomes.	It is an eight-step process through which various tools are used to identify and promote outcomes in a consistent manner. The eight-step process is as follows: visioning; defining business as usual condition; project identification; feasibility assessment; green growth potential assessment; extended cost-benefit analysis; redesigning enabling condition; and business case development.	This is a process-based policy integration framework. The report is focused on Indonesia, so it is not clear if this process is tailored for the Indonesian context or whether it is applicable to other national contexts.	The term natural capital is used in this report, but the concept is not a major theme. Natural assets and ecosystem services are discussed.

Framework	Purpose	Structure	Strengths and weaknesses	Integration of the natural capital concept
Natural Capital Coalition (2018) Natural capital for governments: why, what and how *(25)*	Presents a model of change of how natural capital can be brought into government decision-making.	Presents a model of seven levers of change: create and support insights; support first movers to develop solutions; foster stakeholder participation; (co-) fund change; integrate and mainstream natural capital into policy; promote and support standardization; and change the rules of the game. All levers of change in this model are relevant to natural capital policies, but the fifth lever of change links specifically to national green growth policies.	Explicit natural capital focus for policymakers. Strong links to interaction between government policy and business community. Takes natural capital rather than green growth as starting point, thus suitable to inform on the integration of natural capital into green growth policy frameworks.	Major theme of natural capital in this report and on the usefulness of this concept for achieving different economic, social and environmental policy goals.
Partners for Inclusive Green Economy (2019) Principles, priorities and pathways for inclusive green economies: Economic transformation to deliver the SDGs *(26)*	This report presents a three-part framework to offer a coherent way to get to grips with the complexity of transformation towards greener, more equitable and resilient economies. This is not a blueprint, but instead it enables stakeholders to reflect on progress, challenges and current plans, and to co-create a vision and approach that will work well in their context.	The three-part framework is composed of: principles – a set of 'living' principles to guide collective action towards inclusive green economies; priorities – a set of initial catalytic activities that help to embark on and accelerate the transition; and pathways – a sketch of the kind of medium- to long-term process needed to make the transition. Each of the three components of the framework contains sub-components. There are five principles and 10 priorities. An illustrative pathways figure is provided, composed of a set of illustrative drivers and milestones of pathways to an inclusive green economy.	Detailed combination of normative (principles) and process (pathways) guidance related to the green economy. Only cursory treatment of natural capital perspectives (see right).	The term natural capital is used in this report, but the concept is not a major theme. The concept of ecosystem services is not included.

SECTION 3.
INTEGRATION FRAMEWORK FOR SUPPORTING GREEN GROWTH USING THE NATURAL CAPITAL APPROACH

Informed by our review of both the existing green growth policy frameworks of international and non-governmental organizations in Section 2 and national natural capital policies (see Appendix A.2), here we develop a review framework to better evaluate how the concept of natural capital can support green growth through national application (Table 2).

Table 2. Integration framework for mainstreaming natural capital in green growth policymaking

Overarching goal	
1.1	The concept of capital. Is the environment (including ecosystems) recognized as a capital asset, which provides flows of benefits to human society and the economy?
Components of natural capital*	
2.1	Does the policy framework address all components of natural capital? This includes assets (e.g. ecosystem and commodity assets), flows (i.e. ecosystem services), human inputs to the environment (e.g. investment and employment) and outputs (i.e. benefits derived from and residual impacts on natural capital).**
2.2	Are commodity natural assets considered comprehensively? Assets do not need to be defined specifically, but could include using a typology of assets such as those defined in the System of Environmental-Economic Accounting – Central Framework *(1)*, e.g. minerals and energy, land, soil, timber, aquatic resources, other biological resources and water.
2.3	Are ecosystem assets considered comprehensively? Ecosystem assets do not need to be defined specifically, but could include using an ecosystem typology, such as the WWF Ecoregions system*** *(2)*, to guide the consideration of all ecosystem assets that exist in a country/region.
2.4	Are flows from natural capital considered comprehensively? Flows do not need to be defined specifically, but this could include using an ecosystem services typology, such as the Common International Classification of Ecosystem Services *(3)*.
Policy elements	
3.1	Have policies relevant to the extent, quality and economic value of natural assets been considered in the framework?
3.2	Have policies relevant to biophysical flows from natural capital been considered in the framework?
3.3	Have policies relevant to economic (e.g. investment in realizing benefits from natural capital) and social (e.g. employment) inputs been considered in the framework?
3.4	Have policies relevant to the economic (e.g. value added to national accounts of natural capital), social (e.g. population with access to benefits provided by natural capital) and environmental (e.g. emission of residuals to the environment) impacts of realizing benefits from natural capital been considered in the framework?
3.5	Have policies relevant to the governance of natural capital been considered in the framework?
3.6	Does the framework consider policy instruments incentivizing the measurement of natural capital components that are not currently valued in markets in order to internalize externalities?
3.7	Has the monitoring and reporting of policy outcomes and impacts related to natural capital been considered? Have methods to do this been considered?

* In this framework, biodiversity is considered as a characteristic of all ecosystems, which are in the top level of natural capital, rather than as a distinct asset; therefore, biodiversity would be a key indicator of ecosystem asset quality.

** Residuals comprise the flows of solid, liquid and gaseous materials, and energy that are discarded, discharged or emitted by establishments and households through processes of production, consumption or accumulation.

*** WWF defines an ecoregion as a "large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions".

SECTION 4.
NATURAL CAPITAL AND THE GREEN GROWTH POLICY FRAMEWORKS OF THE GGGI, OECD, UNEP AND WORLD BANK

Here we apply our natural capital review framework in Section 3 to the green growth policy frameworks developed by four Expert Group member organizations: GGGI, OECD, UNEP and World Bank. All have published substantial bodies of literature detailing the frameworks and their application to national policy. Based on this review, we present initial findings where we believe the natural capital approach could offer value for these frameworks and, ultimately, support the progress of global green growth. The underlying literature and results have been discussed with practitioners in each of the four organizations to assure accuracy and completeness. **Appendix A.1** presents the detailed findings.

4.1 GGGI

Literature review

Since 2015, the GGGI has published a number of national and sub-national green growth assessments in a range of countries, including India *(28)*, Indonesia *(31)* and two Indonesian districts *(32, 33)* in 2015, Peru *(34)* in 2016, Lao *(35)*, Myanmar *(36)* and Nepal *(37)* in 2017, Cambodia *(38)* and Mozambique *(39)* in 2018, and most recently Papua New Guinea *(40)* in 2019. These assessments make green growth policy recommendations based on the results of GGGI's Green Growth Potential Analysis (GGPA) method, which consists of a combination of data analysis and stakeholder consultation, to identify and prioritize a country's opportunities for green growth. The GGPA method is based on a conceptual framework that links natural assets to economic activities, social well-being and climate change. In 2016, the GGGI published a methodological report for green growth assessment discussing extended cost-benefit analysis (eCBA), strategic environmental assessment and environmental impact assessment, and apply them to Indonesia as a case study *(41)*. The eCBA is applied to Indonesia in more depth in the GGGI's 2018 report *Green Growth Assessment & Extended Cost Benefit Analysis: A Handbook for Policy and Investment Decision Makers (14)*. For their national and sub-national green growth assessments, the GGPA is tailored to the context of the country and policy recommendations are presented in terms of sectors (e.g. agriculture, mining, forestry), priorities (e.g. climate change, urban development and infrastructure), or a mixture of the two.

Analysis

We find that the concept of natural capital is used in the majority of GGGI's literature, but its prominence varies across the country assessment reports. The GGGI's literature is predominantly framed around commodity assets (e.g. timber, energy and minerals) and the ecosystem assets that provide them (e.g. forests). The concept of ecosystem services features in most reports, but is not explored in depth. Policies focused on the management and governance of natural assets are prominent in the majority of assessments. In most assessments *(32-35, 38, 42)*, sector specific policies are recommended in relation to assets, flows of benefits, human inputs to the environment, and outputs (e.g. benefits and residuals). A range of policy instruments for measuring the components of natural capital that are not currently valued in markets are recommended in a few national and sub-national assessments *(32-35)*, and the cost-benefit analysis method presented *(14, 41)* includes valuation of ecosystem services without market values. The majority of the literature lacks discussion of policy impact assessment, although indicators for monitoring green growth progress are advised in the sub-national assessments *(32, 33)*. In contrast, policy assessment is discussed in depth in the Indonesian assessment *(31)* and is framed around a conceptual measurement framework for green growth from the OECD and a suite of indicators for monitoring impact. In conclusion, we find that natural capital approaches could further strengthen GGGI's green growth framework by addressing ecosystems and ecosystem services more systematically. We also encourage further application of GGGI's indicators for policy monitoring in country assessments.

4.2 OECD

Literature review

The OECD has made great progress over the past decade by consistently producing literature that has advanced thinking on green growth. In 2010 *(43)* they present principles for selecting green growth policies that is followed in 2011 by publication of their Green Growth Strategy *(12, 44)*, which proposes a flexible policy framework accompanied by a measurement framework for monitoring progress through indicators *(45)* that can be tailored to different country circumstances and stages of development. Specific policy instruments are recommended for tackling specific green growth challenges in *(46)*. In 2012, a collaborative report by the OECD, World Bank and United Nations examines how green growth and sustainable development policies can be incorporated into structural reform agendas *(47)*. In 2013, the OECD reviews the national implementation of its green growth policy framework *(21)* and identifies an issue of a focus of national policy frameworks on climate and energy and insufficient focus on areas such as biodiversity, water and agriculture. A similar review is published in 2019, which provides a cross-country review of progress towards green growth in selected emerging market economies that are members or partners of the OECD *(48)*. In 2016, the OECD publishes their Framework for Policy Coherence for Sustainable Development ("the PCSD Framework") *(29)* to support the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals, and apply the PCSD Framework to green growth. This report presents a toolkit of self-screening questions for governments to apply an integrated and whole-government approach to green growth. The OECD has produced green growth-relevant policy guidance for specific sectors including agriculture and fisheries *(49, 50)*, particular policy instruments including protected areas and offsetting *(49-53)*, and country-specific policy reviews *(53-56)*. In addition to this body of green growth work, the OECD has published a large body of literature on the mainstreaming of biodiversity into national plans and strategies, covering topics which include biodiversity policy reform *(57)*, sector-specific policies *(58)*, the evaluation of policy effectiveness *(59)*, national policy implementation *(60)* and post-2020 policy priorities *(61)*.

Analysis

We find that the concepts of natural assets or natural capital are prominent in the majority of OECD green growth literature reviewed. This literature covers a wide range of commodity assets (those defined as discrete assets in the System of Environmental-Economic Accounting – Central Framework *(1)*). These reports often focus on specific sub-sets of commodity assets. Ecosystem assets and ecosystem services are often discussed, usually with reference to specific ecosystem types and case studies. The OECD's consideration of policy instruments is particularly strong. For example, the OECD biodiversity work takes account of a wide range of both market and non-market instruments relevant to natural capital assets, flows, human inputs to the environment, outputs (including benefits and residuals) and governance. A number of policy instruments including protected areas *(51)*, biodiversity offsetting *(52)*, restoration *(61)* and specific sectors *(49, 50, 58)* are analysed in detail, and more recent work has included detailed discussions of policy instruments for measuring the components of natural capital that are not currently valued in markets *(51, 54, 58, 59, 61)*. The OECD's green growth and biodiversity work both place a strong emphasis on policy assessment supported by suggested indicators across the OECD's literature. We conclude that the OECD has a robust framework for green growth policy advice and policy monitoring, as well as strong in-house capacity to further integrate natural capital approaches in this work. To do so, we recommend that the OECD considers taking a systematic approach to commodity assets, ecosystem assets and services, and natural capital policy instruments in its green growth assessments at global and national levels.

4.3 UNEP

Literature review

UNEP have focused its relevant policy work around the concept of the green economy rather than green growth. In 2011, UNEP produced two major reports on the green economy in advance of the Rio+20 conference: an inter-agency vision of inclusive green economy investment and policy options *(62)* and a technical report focused on green economy approaches to specific natural assets and industries *(63)* accompanied by a summary for policymakers *(64)*. In 2013, the UN launched the Partnership for Action on Green Economy (PAGE), a collaboration between UNEP and four other UN agencies, to provide support to countries developing green economy and green growth agendas. In 2014, as part of PAGE, UNEP published the *Green Economy Toolkit for Policymakers (65)* composed of three reports focused on the assessment of green economy policies, and the use of modelling tools and indicators in green economy policymaking. *A Guidance Manual for Green Economy Policy Assessment (66)* provides customized guidance on how to conduct a target-driven Green Economy Policy Assessment (GEPA) in order for policymakers to develop and adopt green economy policies to achieve their sustainable development targets. A modelling framework, the Threshold 21 model (T21), is used as the basis of UNEP's policy assessments, which is structured around the interactions between the environment, society and economy and includes a typology of environmental assets *(67)*. The Integrated Sustainable Development Goals (iSDG) model, which analyses scenarios of policy impact with a focus on the Sustainable Development Goals (SDGs), builds on the T21 model and may supersede it in UNEP's future work *(68)*. In 2014 and 2015, UNEP published a suite of national green economy assessments, using the T21 model, in Burkina Faso *(69)*, Ghana *(70)*, Kenya *(71)* and Senegal *(72)*. A framework for measuring national progress towards a green economy was published in 2017 *(73)*. Most recently, UNEP published the Green Economy Textbook, which presents a systematic framework for their green economy model containing a chapter dedicated to natural capital *(74)*.

Analysis

We find that the concept of natural capital is used in the majority of publications and is discussed in depth in their most recent work *(74)*. The use of a modelling framework to structure assessments, which contains a typology of environmental assets, means that commodity assets (those defined as discrete assets in the System of Environmental- Economic Accounting – Central Framework *(1)*) tend to be considered quite comprehensively in UNEP's literature. Ecosystems and ecosystem services are discussed in some detail in the literature reviewed, but are not treated systematically and there is little discussion of them in the national assessments. The T21 model, which is used for the country assessments, is constrained by data availability, so those natural assets and ecosystem services that lack sufficient data are not included in assessments. This illustrates an important gap that equally constrains other green growth leaders reviewed here. The iSDG model includes a limited set of natural assets and ecosystem services potentially because what is considered is limited to the natural assets and ecosystem services that are explicitly discussed in the SDGs. A wide range of policy instruments, both market and non-market based, relevant to natural capital assets, flows, human inputs to the environment, outputs (including benefits and residuals) and governance are described and supported by case studies in *(63, 64, 66)*. Approaches to valuing environmental benefits that do not have a market value, and relevant policies, are discussed in depth *(74)*. The national assessments make recommendations for specific policy instruments in relation to specific sectors, such as agriculture, energy and forestry. However, there is no discussion of policy instruments for the environmental benefits, which lack market values in the country assessments. A strong emphasis is placed on policy assessment in *(64, 66)*, supported by the *Green Economy Toolkit for Policymakers (65)* and a national measurement framework for monitoring green economy progress *(73)* However, only the country assessment in Ghana provides guidance on methods for conducting assessment of the policies advised. We conclude that a more systematic application of natural capital approaches, particularly the inclusion of ecosystem assets and services, would strengthen UNEP's green economy framework both globally and in national assessments. By integrating its ongoing initiatives related to economic valuation of ecosystem assets and services such as The Economics of Ecosystems and Biodiversity (TEEB), UNEP is also in a strong position to further explore which policy instruments can support the green economy transition, particularly where the components of natural capital are not currently valued by markets.

4.4 WORLD BANK

Literature review

In 2011, the World Bank published a Working Paper *(75)*, which discusses the concept of green growth, proposes approaches to achieving it, and discusses policies that can be used to implement it. In the following year, the World Bank published their inclusive green growth policy framework *(13)*, which uses a three capitals model of human, natural and physical capitals to organize half of its policy framework, with the other half of the framework being structured around types of policy instruments. In the same year, a collaborative report between the World Bank, OECD and UN *(47)* examined how green growth and sustainable development policies can be incorporated into structural reform agendas, providing a toolkit of policy options from which countries may draw upon when designing their own green growth strategies. Between 2013 and 2014, the World Bank published a series of national and regional green growth assessments. These assessments are heterogeneous in their purpose and methodologies used. A regional assessment of Latin America and the Caribbean region (LAC) *(76)* promotes the LAC as the "world's laboratory" for inclusive green growth and suggests a suite of policies to promote green growth in the region. Modelling analysis of green growth and green economy scenarios support policy recommendations for Turkey *(77)* and Macedonia *(78)*. Finally, informed by stakeholder discussions, a 2014 report discusses the green growth strategy options for Bhutan *(79)*. The country assessments structure policy advice around sectors, typically agriculture, water and energy.

Analysis

We find that the concept of natural capital is present in the majority of literature we reviewed, and is a structural theme of the World Bank's inclusive green growth framework *(13)*. Commodity assets (those defined as discrete assets in the System of Environmental- Economic Accounting – Central Framework *(1)*) are considered quite comprehensively. In contrast, ecosystem assets are discussed in little detail in the majority of the literature and there is a lack of discussion of specific ecosystem types, particularly marine ecosystems. This is acknowledged in the inclusive green growth framework *(13)* and marine ecosystem accounting will be addressed in the World Bank's *2020 Changing Wealth of Nations* report *(80)*. Ecosystem services are discussed in a number of reports, but the concept is treated heterogeneously across the literature. For example, in the Bhutan assessment *(79)* ecosystem services are discussed in relation to specific sectors, but are not discussed in the assessments of Macedonia *(78)* or the LAC *(76)*. A wide range of policy instruments, both market and non-market based, relevant to natural capital assets, flows, human inputs to the environment, outputs (including benefits and residuals) and governance are described in detail and supported by diverse case studies. In addition, there is detailed discussion of

policy instruments for measuring the components of natural capital that are not currently valued in markets, such as Payments for Ecosystem Services and emissions valuation. Steps for conducting policy impact assessment are included in the inclusive green growth framework *(13)* alongside discussion of policy assessment in relation to some types of natural assets. Indicators for measuring benefits from green growth policies are detailed in *(47)*. However, this topic is not covered consistently across the country assessments: it is missing from the Macedonia *(78)* and the LAC *(76)* assessments, it is discussed but without suggested methods in Bhutan's assessment *(79)*, and discussed in relation to specific policies with recommended indicators in Turkey's assessment *(77)*. As above, we conclude that the World Bank has begun to take a strong look at natural capital approaches in its green growth work, but has yet to treat ecosystem assets and services systematically. More frequent coverage of appropriate methodologies for conducting policy impact assessments would also benefit the implementation of recommendations in national green growth assessments.

4.5 OVERALL FINDINGS

This section's analysis of selected green growth and related literature reveals that four of the leading green growth frameworks have begun to integrate key elements of natural capital to improve national green growth outcomes. However, natural capital remains a newcomer approach to green growth and has yet to be fully mainstreamed, with clear consequences at the national level *(21)*. To better integrate natural capital approaches, we note the following:

F3.1. Considering ecosystem assets and services more comprehensively as the ecological underpinning for society and the economy. This could involve consulting typologies of commodity assets (e.g. those defined as discrete assets in the System of Environmental- Economic Accounting - Central Framework (SEEA) (1)), ecosystem assets (e.g. evolving classifications from SEEA Experimental Ecosystem Accounting and WWF Ecoregions system (2)) and ecosystem services (e.g. the Common International Classification of Ecosystem Services (3)). Reliable access to national natural capital data is a key factor for success.

F3.2. Identifying specific policy instruments appropriate to different types of natural assets and associated services. This could include specific policy instruments for recognizing and measuring the components of natural capital, and associated services, that are not currently valued in markets.

F3.3. Applying a systems approach to policy assessment and advice that considers the relationships and inter-dependencies between natural assets, flows, human inputs into the environment, and outputs. These are considered in a separate GGKP working paper that focuses on the development of indicators for natural capital, which has been developed for public sector use at the national scale. Further work would be required to address cross-sectoral policy coherence.

F3.4. Monitoring implementation and impact of green growth policies at the national level could be improved through greater provision of methodological advice to country teams during the development of national assessments. This would also support a more robust literature on which policy interventions recommended by international and non-government organizations can be considered best practices for green growth and natural capital.

SECTION 5. CONCLUSIONS AND RECOMMENDATIONS

Social and economic development depends on the sustainable management of natural capital. Global trends in natural capital are declining and are projected to continue to 2050 and beyond due to the impacts of increasing land and sea-use change, exploitation of organisms and climate change. Major changes are needed to recognize and account for natural capital in economic decision-making, which is reflected in a range of international political commitments. This paper is intended to function as a useful resource for international and non-governmental organizations and national and sub-national governments for integrating the concept of natural capital into relevant decision-making.

We make four main recommendations for future work informed by the findings presented above:

R1. Communicate the results of our broad assessment of green growth policy frameworks to the organizations working in this area. The results of this assessment can be used to highlight where organizations can focus efforts for integrating the concept of natural capital into green growth policy work.

R2. Further develop comprehensive and widely acceptable assessment criteria for mainstreaming natural capital into green growth policymaking, and economic policymaking generally, building on the integration framework presented in this paper.

R3. Continue discussion of options and opportunities for incorporating the concept of natural capital into relevant policy frameworks of the GGGI, OECD, UNEP, World Bank and others. Champions within these organizations can use the results of our detailed assessment (see Appendix A.1) to make the case within their organizations for developing their green growth policy work to better integrate the concept of natural capital.

R4. Use and extend the catalogue of natural capital policies presented in Appendix A.2 as a knowledge base when delivering green growth policy advice to national and sub-national governments.

REFERENCES

1. United Nations, 'System of Environmental-Economic Accounting 2012—Central Framework', (United Nations, New York, 2012). Available: https://unstats.un.org/unsd/envaccounting/seeaRev/SEEA_CF_Final_en.pdf
2. WWF, (2019) 'Ecoregions' [Webpage] Available: https://www.worldwildlife.org/biomes, Accessed: 17/05/2019
3. R. Haines-Young, M. Potschin, 'Common International Classification of Ecosystem Services (CICES) V5.1 Guidance on the Application of the Revised Structure', (Fabis Consulting Ltd., Nottingham, UK, 2018). Available: https://cices.eu/content/uploads/sites/8/2018/01/Guidance-V51-01012018.pdf
4. IPBES, (2019) 'Global Assessment. Media Release: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'' [Webpage] Available: https://www.ipbes.net/news/Media-Release-Global-Assessment, Accessed: 09/05/2019
5. UN Environment, 'Global Environment Outlook - GEO-6: Healthy Planet, Healthy People', (Un Environment, Nairobi, 2019). Available: https://www.unenvironment.org/resources/global-environment-outlook-6
6. IPCC, 'Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change', (IPCC, Geneva, Switzerland, 2014). Available: https://www.ipcc.ch/report/ar5/syr/
7. United Nations, 'Paris Agreement on Climate Change', (2015). Available: https://unfccc.int/process-and-meetings/the-paris-agreement/d2hhdC1pcy
8. United Nations, 'Convention on Biological Diversity', (1992). Available: https://www.cbd.int/convention/text/
9. United Nations, 'Sendai Framework for Disaster Risk Reduction 2015-2030', (United Nations Office for Disaster Risk Reduction (UNDRR), New York, 2015). Available: https://www.unisdr.org/we/inform/publications/43291
10. United Nations, 'Transforming our World: The 2030 Agenda for Sustainable Development. General Assembly Resolution A/RES/70/1.', (2015). Available: https://sustainabledevelopment.un.org/post2015/transformingourworld/publication
11. Stockholm Resilience Centre, Looking back at 2016 EAT Stockholm Food Forum, (2017). Available: https://www.stockholmresilience.org/research/research-news/2016-06-21-looking-back-at-2016-eat-stockholm-food-forum.html
12. OECD, 'Towards Green Growth', (OECD Publishing, Paris, 2011). Available: http://www.oecd.org/greengrowth/towards-green-growth-9789264111318-en.htm
13. World Bank, 'Inclusive Green Growth: The Pathway to Sustainable Development', (World Bank, Washington, DC, 2012). Available: https://openknowledge.worldbank.org/handle/10986/6058
14. GGGI, 'Green Growth Assessment & Extended Cost Benefit Analysis: A handbook for policy and investment decision makers', (2018). Available: https://www.greengrowthknowledge.org/resource/green-growth-assessment-extended-cost-benefit-analysis-handbook-policy-and-investment
15. UNEP, (2014) 'Green Economy Toolkit for Policymakers' [Webpage] Available: https://www.un-page.org/green-economy-toolkit-policymakers, Accessed: 18/08/2019
16. Philippines National Economic and Development Authority, 'Philippine Development Plan 2017-2022', (Philippines National Economic and Development Authority, Philippines, 2017). Available: http://pdp.neda.gov.ph/
17. The Government of the Republic of the Union of Myanmar. Ministry of Planning and Finance, 'Myanmar Sustainable Development Plan (2018 – 2030)', (2018). Available: http://www.themimu.info/sites/themimu.info/files/documents/Core_Doc_Myanmar_Sustainable_Development_Plan_2018_-_2030_Aug2018.pdf
18. Republic of South Africa National Planning Commission, 'National Development Plan 2030 Our Future-make it work', (2017). Available: https://www.brandsouthafrica.com/governance/ndp/the-national-development-plan-downloads
19. Federal Republic of Nigeria Ministry of Budget and National Planning, 'Economic Recovery and Growth Plan 2017-2020', (2017). Available: https://nigeriandocuments.blogspot.com/p/economic-recovery-and-growth-plan-2017.html
20. World Bank, (2017) 'Lao PDR to Adopt Green Growth, with World Bank Support' [Webpage] Available: http://www.worldbank.org/en/news/press-release/2017/05/31/lao-pdr-to-adopt-green-growth-with-world-bank-support, Accessed: 24/05/2019
21. OECD, 'What Have We Learned from Attempts to Introduce Green-Growth Policies?', OECD Green Growth Papers, No. 2013/02 (OECD Publishing, Paris, 2013). Available: https://www.oecd-ilibrary.org/content/paper/5k486rchlnxx-en
22. O. African Development Bank, UN, and World Bank,, 'A Toolkit of Policy Options to Support Inclusive Green Growth', (United Nations Development Proramme, 2013). Available: https://www.undp.org/content/undp/en/home/librarypage/environment-energy/toolkit-inclusive-green-growth.html

23. K-water Institute and the World Water Council, 'Water and green growth. Beyond the theory for sustainable future', (K-water Institute, Republic of Korea, 2015). Available: http://suen.ormansu.gov.tr/suen/Files/Vol%201%20[Water%20and%20Green%20Growth].pdf

24. UNDESA, 'Handbook for the preparation of voluntary national reviews', (2018). Available: https://sustainabledevelopment.un.org/content/documents/20872VNR_hanbook_2019_Edition_v4.pdf

25. M. Lok *Source:*, 'Natural capital for governments: why, what and how' (2018). Available: https://naturalcapitalcoalition.org/wp-content/uploads/2019/02/GDNC2018-005-WS3-Natural-capital-for-governments-Final-28-02-2019.pdf

26. Partners for Inclusive Green Economy, 'Principles, priorities and pathways for inclusive green economies: Economic transformation to deliver the SDGs', (2019). Available: https://www.greeneconomycoalition.org/news-analysis/principles-priorities-pathways-for-inclusive-green-economies#

27. African Development Bank, 'Green Growth Mozambique. Transition Towards Green Growth in Mozambique. Policy Review and Recommendations for Action', (African Development Bank, Côte d'Ivoire, 2015). Available: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Transition_Towards_Green_Growth_in_Mozambique_-_Policy_Review_and_Recommendations_for_Action.pdf

28. The Energy and Resources Institute and GGGI, 'Green Growth and Sustainable Development in India Towards the 2030 Development Agenda', (2015). Available: https://www.teriin.org/projects/green/

29. OECD, Policy coherence and green growth in Better Policies for Sustainable Development 2016: A New Framework for Policy Coherence. (OECD Publishing, Paris, 2016). Available: https://www.oecd-ilibrary.org/development/better-policies-for-sustainable-development-2016/policy-coherence-and-green-growth_9789264256996-9-en3GGSDI, 'Green Growth and Sustainable Development in India', (The Energy and Resources Institute and Global Green Growth Institute, 2015). Available: http://www.greengrowthknowledge.org/sites/default/files/downloads/resource/GreenGrowthandSustainableDevelopmentinIndia_TERI_GGGI.pdf

30. Government of Indonesia - GGGI Green Growth Program, 'Delivering Green Growth for a Prosperous Indonesia. A Roadmap for Policy, Planning, and Investment', (Government of Indonesia - GGGI Green Growth Program, Indonesia, 2015). Available: http://greengrowth.bappenas.go.id/wp-content/uploads/2018/02/201512221340.GGGI_Roadmap_Full_English_spread_lores.pdf

31. GGGI, 'Murung Raya Green Growth Strategy', (2015). Available: Not available

32. GGGI, 'Pulang Pisau Green Growth Strategy', (2015). Available: Not available

33. GGGI, 'Green Growth Potential Assessment – Peru Country Report', (2016). Available: https://gggi.org/report/green-growth-potential-assessment-peru-country-report/

34. GGGI, 'Green Growth Potential Assessment – Lao PDR Country Report', (2017). Available: https://gggi.org/report/green-growth-potential-assessment-lao-pdr-country-report/

35. GGGI, 'Green Growth Potential Assessment – Myanmar Country Report', (2017). Available: https://gggi.org/report/green-growth-potential-assessment-myanmar-country-report/

36. GGGI, 'Green Growth Potential Assessment – Nepal Country Report', (2017). Available: https://gggi.org/report/green-growth-potential-assessment-nepal-country-report/

37. GGGI, 'Green Growth Potential Assessment – Cambodia Report', (2018). Available: https://gggi.org/report/green-growth-potential-assessment-cambodia-report/

38. GGGI, 'Green Growth Potential Assessment – Mozambique Country Report', (2018). Available: https://gggi.org/report/green-growth-potential-assessment-mozambique-country-report/

39. GGGI, 'Green Growth Potential Assessment of Papua New Guinea', (2019). Available: https://gggi.org/report/green-growth-potential-assessment-of-papua-new-guinea/

40. GGGI & Government of Indonesia, 'Mainstreaming Green Growth Assessment Tools In Economic & Development Planning The role of extended cost benefit analysis in Shaping Public & Private Investment', (2016). Available: Not available

41. GGGI, 'Green Growth Potential Assessment. Myanmar Country Report', (2017). Available: https://gggi.org/site/assets/uploads/2018/01/Myanmar-Country-Report-V5.pdf

42. A. de Serres *Source:*, 'A Framework for Assessing Green Growth Policies', (OECD Publishing, Paris, 2010). Available: https://www.oecd-ilibrary.org/content/paper/5kmfj2xvcmkf-en

43. OECD, 'Towards Green Growth: A summary for policy makers', (OECD Publishing, Paris, 2011). Available: http://www.oecd.org/greengrowth/48012345.pdf

44. OECD, Towards Green Growth: Monitoring Progress. (OECD Publishing, Paris, 2011).

45. OECD, 'Tools for delivering on green growth', paper presented at the OECD Meeting of the Council at Ministerial Level 25-26 May, Paris, Available: http://www.oecd.org/greengrowth/48012326.pdf

46. OECD World Bank and UN, 'Incorporating green growth and sustainable development policies into structural reform agendas', paper presented at the G20 Summit 18 - 19 June 2012, Los Cabos, Mexico, Available: https://www.oecd.org/g20/topics/energy-environment-green-growth/G20_report_on_GG_and_SD_final.pdf

47. Capozza, R. Samson, 'Towards Green Growth in Emerging Market Economies'. (2019). Available: https://www.oecd-ilibrary.org/content/paper/d5e5b5d7-en

48. OECD, Policy Instruments to Support Green Growth in Agriculture. (OECD Publishing, Paris, 2013).

49. OECD, Green Growth in Fisheries and Aquaculture. (OECD Publishing, Paris, 2015).

50. OECD, Marine Protected Areas: Economics, Management and Effective Policy Mixes. (OECD Publishing, Paris, 2017).

51. OECD, Biodiversity Offsets: Effective Design and Implementation. (OECD Publishing, Paris, 2016).

52. OECD, Addressing Industrial Air Pollution in Kazakhstan. (OECD Publishing, Paris, 2019).

53. OECD, OECD Green Growth Policy Review of Indonesia 2019. OECD Environmental Performance Reviews (OECD Publishing, Paris, 2019).

54. S. Bass *Source:*, 'Making Growth Green and Inclusive: The Case of Ethiopia'. (2013). Available: https://www.oecd-ilibrary.org/content/paper/5k46dbzhrkhl-en

55. E. Y. Mohammed *Source:*, 'Making Growth Green and Inclusive: The Case of Cambodia'. (2013). Available: https://www.oecd-ilibrary.org/content/paper/5k420651szzr-en

56. OECD, The Political Economy of Biodiversity Policy Reform. (OECD Publishing, Paris, 2017).

57. OECD, 'Mainstreaming Biodiversity for Sustainable Development', (OECD Publishing, Paris, 2018). Available: https://doi.org/10.1787/9789264303201-en

58. K. Karousakis, 'Evaluating the effectiveness of policy instruments for biodiversity', OECD Environment Working Papers (OECD Publishing, Paris, 2018). Available: https://www.oecd-ilibrary.org/content/paper/ff87fd8d-en

59. OECD, 'Tracking Economic Instruments and Finance for Biodiversity', (OECD Publishing, Paris, 2018). Available: https://www.oecd.org/environment/resources/Tracking-Economic-Instruments-and-Finance-for-Biodiversity.pdf

60. OECD, 'Biodiversity: Finance and the Economic and Business Case for Action', (OECD Publishing, Paris, 2019). Available: http://www.oecd.org/environment/resources/biodiversity/biodiversity-finance-and-the-economic-and-business-case-for-action.htm

61. United Nations Environment Management Group, 'Working towards a balanced and inclusive green economy: A United Nations system-wide presepective', (United Nations, New York, 2011). Available: https://www.zaragoza.es/contenidos/medioambiente/onu/1209-eng.pdf

62. UNEP, 'Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication', (2011). Available: www.unep.org/greeneconomy

63. UNEP, 'Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers', (2011). Available: https://www.unenvironment.org/resources/report/pathways-sustainable-development-and-poverty-eradication

64. UN-PAGE, (2014) 'Green Economy Toolkit for policymakers' [Webpage] Available: https://www.un-page.org/green-economy-toolkit-policymakers, Accessed: 15/08/2019

65. UNEP, 'A Guidance Manual for Green Economy Policy Assessment', (2014). Available: https://www.un-page.org/guidance-manual-green-economy-policy-assessment

66. UNEP, 'Using Models for Green Economy Policymaking. ', (2014). Available: https://www.un-page.org/using-models-green-economy-policymaking

67. Millenium Institute, 'Threshold 21 (T21) iSDG Model documentation', (Millenium Institute, Washington D.C., 2016). Available: https://www.millennium-institute.org/documentation

68. UNEP, 'Green Economy Assessment Study – Burkina Faso ', (2014). Available: https://www.greengrowthknowledge.org/resource/green-economy-assessment-study-%E2%80%93-burkina-faso

69. UNEP, 'Green Economy Assessment Report for Ghana', (2015). Available: https://www.greengrowthknowledge.org/resource/green-economy-assessment-report-ghana

70. UNEP, 'Green Economy Assessment Report – Kenya', (2014). Available: https://www.greengrowthknowledge.org/resource/green-economy-assessment-report-kenya

71. UNEP, 'Green Economy Assessment Study - Senegal', (2014). Available: https://www.greengrowthknowledge.org/resource/green-economy-assessment-study-senegal

72. PAGE, 'The Green Economy Progress Measurement Framework – Methodology.', (2017). Available: https://www.un-page.org/files/public/gep_methodology.pdf

73. D. Eaton, F. Sheng, Eds., Inclusive Green Economy: Policies and Practice, (Zayed International Foundation for the Environment & Tongji University, Dubai, Shanghai, 2019).

74. World Bank, 'From Growth to Green Growth. A Framework', (2011). Available: https://openknowledge.worldbank.org/handle/10986/3670

75. World Bank, 'Inclusive Green Growth in Latin America and the Caribbean. LAC opportunities for all', (2013). Available: https://openknowledge.worldbank.org/handle/10986/16595

76. World Bank, 'Turkey Green Growth Policy Paper : Towards a Greener Economy', (2013). Available: https://openknowledge.worldbank.org/handle/10986/16088

77. World Bank, 'FYR Macedonia Green Growth Country Assessment', (2014). Available: https://openknowledge.worldbank.org/handle/10986/19308

78. World Bank, 'Green Growth Opportunities for Bhutan', (2014). Available: https://openknowledge.worldbank.org/handle/10986/20804

79. G.-M. Lange, (2019) 'The Changing Wealth of Nations 2018: Building a Sustainable Future. Oral presentation at the Forum of Experts on SEEA Experimental Ecosystem Accounting 2019, Glen Cove, New York' [Webpage] Available: https://seea.un.org/events/2019-forum-experts-seea-experimental-ecosystem-accounting, Accessed: 17/08/2019

80. R. Verburg *Source:*, 'Governing ecosystem services: National and local lessons from policy appraisal and implementation'. Ecosystem Services 18, 186-197 (2016). Available: http://www.sciencedirect.com/science/article/pii/S2212041616300687

81. A. D. Guerry *Source:*, 'Natural capital and ecosystem services informing decisions: From promise to practice'. Proceedings of the National Academy of Sciences 112, 7348-7355 (2015). Available: https://www.pnas.org/content/pnas/112/24/7348.full.pdf

82. UNEP, 'Green Economy Assessment Study – Burkina Faso', (UNEP, 2014). Available: http://www.un-page.org/files/public/green_economy_burkinafaso_2014_2.pdf

83. France Interministerial Delegate for Sustainable Development, 'National Sustainable Develpoment Strategy 2010-2013 Towards a green and fair economy', (Delegation for Sustainable Development, Paris, 2010). Available: http://www.greengrowthknowledge.org/national-documents/france-national-sustainable-development-strategy-2010-2013-towards-green-and-fair

84. PAGE, 'Mongolia's transition to a Green Economy: A stocktaking report', (United Nations Environment Programme, New York, 2014). Available: http://www.un-page.org/files/public/mongolia_green_economy_eg_full_nov16_web.pdf

85. United Arab Emirates Ministry of Climate Change & Environment, 'UAE State of Green Economy Report 2017', (2017). Available: http://www.un-page.org/files/public/uae_state_of_green_economy_report_2017_0.pdf

86. OECD, Chapter 3. Policy guidance for resource efficiency in Policy Guidance for Resource Efficiency. (OECD Publishing, Paris, France, 2016). Available: http://www.oecd.org/env/policy-guidance-on-resource-efficiency-9789264257344-en.htm

APPENDIX

A.1 DETAILED ASSESSMENT OF THE INTEGRATION OF THE NATURAL CAPITAL CONCEPT IN THE GREEN GROWTH POLICY FRAMEWORKS OF THE GGGI, OECD, UNEP AND WORLD BANK

The question numbers refer to those in the integration framework (Table 2) of this report. The result of this detailed assessment is also available in a spreadsheet format.

1. GGGI

(1) GGGI and Government of Indonesia (2015) Delivering Green Growth for a Prosperous Indonesia. A Roadmap for Policy, Planning and Investment

URL	http://greengrowth.bappenas.go.id/wp-content/uploads/2018/02/201512221340.GGGI_Roadmap_Full_English_spread_lores.pdf
Purpose	This is a national green growth policy review.
1.1	Yes
2.1	Yes
2.2	Policies are recommended for specific stocks, including energy and minerals, timber, other biological resources and soil. Indicators cover forests, fish stocks, and mineral reserves.
2.3	Policies are suggested for specific ecosystems, including marine, coastal and peatlands.
2.4	No
3.1	Structures policy advice around a mixture of stocks (energy and extractives, and renewable natural resources) and sectors (manufacturing, connectivity, and new natural capital-based markets). Policies are not specific characteristics if stocks. The indicators suggested are quite comprehensive in terms of how stocks are monitored including extent and quality indicators. However, this is not linked to policies.
3.2	Suggests PES and carbon-related policies, which may link to biophysical flows.
3.3	Yes. Policies relevant to investment and employment are suggested. Indicators of employment are discussed, but not linked to policies.
3.4	The indicators suggested are quite comprehensive in terms of how benefits and residuals are monitored. However, this is not linked to policies.
3.5	Several policies relevance to governance are suggested. Indicators of governance are discussed, but not linked to policies.
3.6	Suggests PES as a policy instrument to support new natural capital-based markets and carbon pricing.
3.7	Yes. Suggests the use of indicators, structured around the OECD conceptual measurement framework for green growth, which includes policy tracking indicators.
Recommended by expert	No

(2) The Energy and Resources Institute and GGGI (2015) Green Growth and Sustainable Development in India Towards the 2030 Development Agenda

URL	https://www.teriin.org/projects/green
Purpose	This is a national green growth policy review. It is composed of a technical report detailing a modelling analysis and a summary for policymakers.
1.1	No
2.1	No
2.2	A few stocks are focused on (energy, forests, water) while others are mentioned (soil, fisheries).
2.3	Ecosystems are discussed but different types of ecosystems are not specified.
2.4	No
3.1	Structures policy advice around sectors and environmental issues.
3.2	No
3.3	Yes. Investment policies are discussed, but less on employment.
3.4	Pollution is discussed in detail, and some discussion of social benefits.
3.5	Yes
3.6	No
3.7	No
Recommended by expert	No

(3) GGGI (2015) Murung Raya Green Growth Strategy

URL	Not publicly available
Purpose	A green growth strategy for the Indonesian district of Murung Raya.
1.1	Yes
2.1	Yes
2.2	Focuses on sectors that are relevant to natural capital including forestry, mining, plantations and energy.
2.3	No
2.4	Range of ecosystem services relevant to the focus sectors discussed.
3.1	Several policies are likely to impact asset quantity, quality and value.
3.2	No
3.3	Some policies are likely to impact investment and employment, but do not target it specifically.
3.4	Some policies likely to impact outputs but do not target them specifically.
3.5	Yes. Majority of policies recommended are related to governance.
3.6	Yes. Recommends High Conservation Value assessments to protect areas with high ecosystem service value, and Payments for Ecosystem Services.
3.7	Yes. Outlines a suite of indicators for monitoring green growth progress.
Recommended by expert	Yes

(4) GGGI (2015) Pulang Pisau Green Growth Strategy

URL	Not publicly available
Purpose	A green growth strategy for the Indonesian district of Pulang Pisau.
1.1	Yes
2.1	Yes
2.2	Focuses on sectors that are relevant to natural capital including forestry, aquaculture, plantations and renewable energy.
2.3	Only mangrove ecosystems discussed.
2.4	Range of ecosystem services relevant to the focus sectors discussed.
3.1	Several policies are likely to impact asset quantity, quality and value.
3.2	No
3.3	Some policies are likely to impact investment and employment but do not target it specifically.
3.4	Two policies on waste and use for renewable energy.
3.5	Yes. Majority of policies recommended are related to governance.
3.6	Yes. Recommends High Conservation Value assessments to protect areas with high ecosystem service value.
3.7	Yes. Outlines a suite of indicators for monitoring green growth progress.
Recommended by expert	Yes

(5) GGGI (2016) Green Growth Potential Assessment – Peru Country Report

URL	https://gggi.org/report/green-growth-potential-assessment-peru-country-report
Purpose	A green growth potential analysis, which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth.
1.1	Yes
2.1	The analysis is based on a conceptual framework that includes natural assets, economic activities, social well-being and climate change.
2.2	Focuses on forests, agriculture, energy and minerals, and water.
2.3	Discusses wetlands and forests.
2.4	Uses concept and lists a few specific services.
3.1	Yes. Recommends policies in relation to water quality.
3.2	Yes. Recommends policies in relation to water supply.
3.3	Yes. Recommends policies relevant to investment.
3.4	Yes. Includes policies on benefits (economic benefits of mining, access to electricity).
3.5	Yes. Policies on sustainable agriculture management, sustainable forest certification.
3.6	Yes. Recommends water tariff revision to compensate for ecosystem services, and PES.
3.7	No
Recommended by expert	No

(6) GGGI & Government of Indonesia (2016) Mainstreaming Green Growth Assessment Tools in Economic & Development Planning The role of extended cost benefit analysis in Shaping Public & Private Investment

URL	Not publicly available
Purpose	Provides recommendations to integrate green growth assessment tools into Indonesia's existing economic and environmental planning and regulatory processes.
1.1	Yes
2.1	No. Would be out of scope of this report.
2.2	Same as 2.1
2.3	Same as 2.1
2.4	Same as 2.1
3.1	Same as 2.1
3.2	Same as 2.1
3.3	Same as 2.1
3.4	Same as 2.1
3.5	Same as 2.1
3.6	Same as 2.1
3.7	Presents a number of methods that can support policy impact assessment and discuss in the context of Indonesia.
Recommended by expert	Yes

(7) GGGI (2017) Green Growth Potential Assessment – Lao PDR Country Report

URL	https://gggi.org/report/green-growth-potential-assessment-lao-pdr-country-report
Purpose	A green growth potential analysis, which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth.
1.1	Uses natural capital terminology but is not strong theme in report.
2.1	The analysis is based on a conceptual framework that includes natural assets, economic activities, social wellbeing and climate change.
2.2	Focuses on agriculture, fisheries, forestry, land, energy and minerals.
2.3	Focuses on forest and aquatic ecosystems.
2.4	Uses concept but does not discuss specific ecosystem services.
3.1	Policies for spatial planning tools and ecosystem restoration, urban ecosystem quality (biodiversity) and rents from natural resources.
3.2	Includes policies on fisheries yield.
3.3	Includes policies on investment and labour markets and capacity building.
3.4	Includes policies in benefits (tourism, access to low carbon transport, electricity access) and residuals (waste management).
3.5	Yes. Includes agricultural and forest management policies.
3.6	Yes. Includes PES and markets for ecosystem services
3.7	No
Recommended by expert	No

(8) GGGI (2017) Green Growth Potential Assessment – Myanmar Country Report

URL	https://gggi.org/report/green-growth-potential-assessment-myanmar-country-report/
Purpose	A green growth potential analysis, which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth.
1.1	Uses natural capital terminology but is not strong theme in report.
2.1	The analysis is based on a conceptual framework that includes natural assets, economic activities, social well-being and climate change.
2.2	Focuses on agriculture, forestry, land, energy and minerals.
2.3	Focuses on forest ecosystems.
2.4	Uses concept and lists a few specific services.
3.1	Includes policies on forest land cover, biodiversity.
3.2	Includes policies on agriculture productivity.
3.3	Includes policies on investment and capacity building.
3.4	Yes. Includes policies on benefits (tourism, electricity access) and residuals (waste management).
3.5	Yes. Incudes policies on agricultural management practices, sustainable mining, and governance across government ministries.
3.6	No
3.7	No
Recommended by expert	No

(9) GGGI (2017) Green Growth Potential Assessment – Nepal Country Report

URL	https://gggi.org/report/green-growth-potential-assessment-nepal-country-report
Purpose	A green growth potential analysis, which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth.
1.1	No
2.1	The analysis is based on a conceptual framework that includes natural assets, economic activities, social wellbeing and climate change.
2.2	Focuses on forests, land, agriculture, energy and water.
2.3	Focuses on forest ecosystems.
2.4	No
3.1	Land use planning policies in relation to extent and quality and quantity of land and water is advised.
3.2	No
3.3	No
3.4	Yes. Includes policies on benefits (access to electricity, water access).
3.5	Yes. Policies on agroforestry management, climate smart agriculture, sustainable farming, river basin management, community water management, standards for water harvesting in buildings.
3.6	Yes. Recommends PES.
3.7	No
Recommended by expert	No

(10) GGGI (2018) Green Growth Potential Assessment – Cambodia Report

URL	https://gggi.org/report/green-growth-potential-assessment-cambodia-report/
Purpose	A green growth potential analysis, which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth.
1.1	Yes
2.1	The analysis is based on a conceptual framework that includes natural assets, economic activities, social well-being and climate change.
2.2	Focuses on forests, energy and agriculture, and timber.
2.3	Focuses mainly on forest ecosystems.
2.4	A range of ecosystem services are discussed.
3.1	Policies for mapping forest extent.
3.2	Policies on measuring agricultural yield are advised.
3.3	Policies relating to investment are discussed.
3.4	Policies relating to residuals are discussed.
3.5	Yes. Includes forest management certification.
3.6	No
3.7	Yes. Indicators for monitoring are discussed.
Recommended by expert	No

(11) GGGI (2018) Green Growth Potential Assessment – Mozambique Country Report

URL	https://gggi.org/report/green-growth-potential-assessment-mozambique-country-report
Purpose	A green growth potential analysis, which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth.
1.1	Uses natural capital terminology.
2.1	The analysis is based on a conceptual framework that includes natural assets, economic activities, social well-being and climate change.
2.2	Reports on land, aquatic resources, water, energy and minerals, and timber.
2.3	Focuses on forest ecosystems.
2.4	List some ecosystem services in relation to forests.
3.1	No
3.2	No
3.3	Policies relating to investment are discussed.
3.4	No
3.5	Yes. Include forest conservation policies, agroforestry, irrigation, timber certification, sustainable fuelwood and charcoal production and use.
3.6	No
3.7	No
Recommended by expert	No

(12) GGGI (2018) Green Growth Assessment & Extended Cost Benefit Analysis: A handbook for policy and investment decision-makers

URL	https://www.greengrowthknowledge.org/resource/green-growth-assessment-extended-cost-benefit-analysis-handbook-policy-and-investment
Purpose	Presents the Green Growth Assessment Process (GGAP), a tool designed to select policies (macro level) and prioritize projects (micro/project level) to achieve green growth outcomes.
1.1	Yes
2.1	Yes
2.2	Yes. Provides quite a comprehensive suite of commodity assets in their list of indicators.
2.3	To concept of ecosystems is used but specific ecosystems are not discussed.
2.4	A range of ecosystem services are discussed, but no typology is used.
3.1	Does not discuss specific policies. Rather, policy recommendation is discussed as a step in their cost-benefit analysis process.
3.2	Does not discuss specific policies. Rather, policy recommendation is discussed as a step in their cost-benefit analysis process.
3.3	Does not discuss specific policies. Rather, policy recommendation is discussed as a step in their cost-benefit analysis process.
3.4	Does not discuss specific policies. Rather, policy recommendation is discussed as a step in their cost-benefit analysis process.
3.5	Does not discuss specific policies. Rather, policy recommendation is discussed as a step in their cost-benefit analysis process.
3.6	Includes ecosystem service levies as a policy instrument. Their cost-benefit analysis method includes valuation of ecosystem services without market values.
3.7	Yes. Suggests a suite of indicators for evaluating the implementation of policies.
Recommended by expert	No

(13) GGGI (2019) Green Growth Potential Assessment of Papua New Guinea

URL	https://gggi.org/report/green-growth-potential-assessment-of-papua-new-guinea
Purpose	A green growth potential analysis, which consists of a combination of data analysis and stakeholder consultation in order to identify and prioritize a country's opportunities for green growth. In this analysis there is a focus on climate change.
1.1	Yes. Uses natural asset terminology.
2.1	The analysis is based on a conceptual framework that includes natural assets, resource efficiency, social inclusion and risk and resilience.
2.2	Focuses on forests, energy and agriculture.
2.3	Discusses forest and marine ecosystem.
2.4	A range of ecosystem services are discussed.
3.1	Policies for mapping forest extent.
3.2	No
3.3	No
3.4	No
3.5	Yes. Includes forest management certification and sustainable agriculture practices and fuelwood production.
3.6	No
3.7	No
Recommended by expert	No

2. OECD

(1) OECD (2010) A Framework for Assessing Green Growth Policies

URL	https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=696&menu=1515
Purpose	This academic-style paper from the OECD focuses on two key elements: the first identifies principles and criteria for selecting policies that contribute to economic growth whilst reducing environmental impact, and the second examines what structural adjustments are required in the transition to the green economy.
1.1	Yes. Refers to stocks of environmental capital.
2.1	Yes. Discusses stocks, specific ecosystem services, outputs, and investment and employment related to green jobs.
2.2	Quite comprehensively. There is discussion of air, water, land and soil. However, there is little discussion of aquatic resources or minerals.
2.3	Ecosystems are discussed but different types of ecosystems are not specified.
2.4	Does not use the 'ecosystem service' terminology. Refers to a few specific ecosystem services but does not discuss them comprehensively.
3.1	Discusses the quality of environmental assets only.
3.2	No
3.3	Policies relating to employment are discussed.
3.4	Discusses the valuation of health impacts of the environment.
3.5	Yes, but not comprehensively. Discusses forest and water management policies.
3.6	No
3.7	Yes. Discusses the need for policy assessment. Specific methods for conducting assessment are not discussed.
Recommended by expert	No

(2) OECD (2011) Towards Green Growth

URL	http://www.oecd.org/env/towards-green-growth-9789264111318-en.htm
Purpose	Presents the OECD's Green Growth Strategy, which provides concrete recommendations and measurement tools to support countries' efforts to achieve economic growth and development, while at the same time ensure that natural assets continue to provide the ecosystem services on which our well-being relies. The strategy proposes a flexible policy framework that can be tailored to different country circumstances and stages of development.
1.1	Yes. Uses natural capital terminology.
2.1	Yes. Discusses natural capital, ecosystem services, human inputs in terms of employment and investment, and outputs in terms of benefits and residuals.
2.2	Yes. Provides examples of policy instruments in relation to a range of commodity assets. No discussion of a typology used.
2.3	Yes. A range of ecosystem types are cited in examples of policy instrument application. No discussion of a typology used.
2.4	Yes. A range of ecosystem services are cited in examples of policy instrument application. No discussion of a typology used.
3.1	Yes
3.2	Yes. Discusses subsidies and PES in relation to ecosystem services.
3.3	Yes. Discusses policies in relation to employment and investment.
3.4	Yes. One of the main messages of the report is about sustainably realizing economic benefits of the environment. Discusses distributional issues in relation to impacts of policies, as well as the effects on health and amenity of benefits. Discusses residuals.
3.5	Yes. Discusses the need for and importance of governance.
3.6	There is a strong focus on market instruments. There is a brief discussion on valuing non-market benefits. Discusses PES.
3.7	Discusses need for policy monitoring and evaluation. Discusses the need for the OECD to develop indicators for green growth policy evaluation, and long-term goal of mainstreaming the process of policy monitoring and evaluation.
Recommended by expert	No

(3) OECD (2011) Towards Green Growth: Monitoring Progress

URL	https://www.oecd-ilibrary.org/environment/towards-green-growth-monitoring-progress_9789264111356-en
Purpose	This book provides measurement tools, including indicators, to support countries' efforts to achieve economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which well-being relies. This is a measurement framework rather than a policy framework.
1.1	Yes
2.1	Yes
2.2	Yes. The indicators of the natural asset base relate to freshwater resources, forest resources, fish resources, mineral resources, land resources, soil resources and wildlife resources.
2.3	Uses 'biodiversity and ecosystems' as an upper level of a 'natural asset base' typology, underneath which is land, soil and wildlife resources. Does not discuss specific ecosystem types.
2.4	A range of ecosystem services are discussed
3.1	This report is focused on indicators rather than policies so this criterion is not relevant.
3.2	This report is focused on indicators rather than policies so this criterion is not relevant.
3.3	This report is focused on indicators rather than policies so this criterion is not relevant.
3.4	This report is focused on indicators rather than policies so this criterion is not relevant.
3.5	This report is focused on indicators rather than policies so this criterion is not relevant.
3.6	Yes. Includes discussion of PES.
3.7	Yes. Includes a section on the use of their indicators to monitor policy responses.
Recommended by expert	Yes

(4) OECD (2011) Tools for delivering on green growth

URL	http://www.oecd.org/greengrowth/48012326.pdf
Purpose	Suggests a range of policy options to tackle typical policy challenges faced by developed, developing and least developed countries.
1.1	Uses natural asset terminology, but it is not a strong theme in the report.
2.1	Yes, discusses natural assets, ecosystem services, human inputs and outputs.
2.2	No
2.3	No
2.4	No
3.1	No
3.2	No
3.3	Yes. Detailed discussion of policies relevant to investment and employment.
3.4	Discusses policies relevant to income distribution issues.
3.5	No
3.6	No
3.7	Yes. Discusses importance of monitoring and review of policy effects.
Recommended by expert	No

(5) OECD (2011) Towards Green Growth: A summary for policymakers

URL	http://www.oecd.org/greengrowth/48012345.pdf
Purpose	A summary for policymakers of the OECDs Green Growth Strategy.
1.1	Yes. Uses natural capital terminology.
2.1	Partly. Does not discuss flows (ecosystem services). Does discuss assets, human inputs and outputs.
2.2	Refers to a range of natural asset types including renewable stocks (water, forest, fish resources) and non-renewable stocks (mineral resources).
2.3	Refers to ecosystems but does not go into detail about specific types.
2.4	No
3.1	No. Relevant policy instruments are not discussed.
3.2	No. Relevant policy instruments are not discussed.
3.3	Yes. Discusses policy options in relation to innovation, investment and employment.
3.4	Yes
3.5	Yes. States that the framework aims to improve resource management.
3.6	No
3.7	Yes. Discusses monitoring policy responses, and cites their report *Towards Green Growth – Monitoring Progress: OECD Indicators (2011).*
Recommended by expert	No.

(6) OEDC, World Bank and UN (2012) 'Incorporating green growth and sustainable development policies into structural reform agendas'

URL	https://www.oecd.org/g20/topics/energy-environment-green-growth/G20_report_on_GG_and_SD_final.pdf
Purpose	This report examines how green growth and sustainable development policies can be incorporated into structural reform agendas. The report was prepared in response to the request from G20 finance ministers and central bank governors in their communiqué of 25-26 February 2012 that asked the OECD, with the World Bank and the UN, to prepare a report that provides options for G20 countries on inserting green growth and sustainable development policies into structural reform agendas, tailored to specific country conditions and level of development.
1.1	Yes. Uses natural capital terminology.
2.1	Yes
2.2	Lists a range of natural assets: agricultural lands; subsoil assets (oil, gas, coal, and minerals); forests; water; fisheries; and the atmosphere.
2.3	No
2.4	Lists a range of ecosystem services, including provisioning and regulating services, but this is not comprehensive.
3.1	Yes. Relevant policy instruments are listed but not in relation to specific assets.
3.2	Yes. Relevant policy instruments are listed but not in relation to specific flows.
3.3	Yes. Discusses investment, labour market and skill policies.
3.4	Discusses policies relevant to income distribution issues, health and education.
3.5	Yes. Discusses use of policy instruments to improve natural capital management and for promoting sustainable practices, using examples from forestry and fisheries.
3.6	Yes. Details non-market based policy instruments with examples and common applications, strengths and weaknesses, and conditions for favourable use. Discusses PES.
3.7	Yes. Suggests indicators to measure benefits from green growth policies.
Recommended by expert	No

(7) OECD (2013) Policy Instruments to Support Green Growth in Agriculture

URL	https://doi.org/10.1787/9789264203525-en
Purpose	This report synthesizes the experience of OECD countries in developing and implementing policies, programmes and initiatives related to green growth in the agricultural sector, based primarily on material provided by governments. It discusses the overall approach that countries are taking towards establishing a green growth strategy in agriculture, the implementation of the OECD framework for monitoring progress towards green growth in agriculture, and the various policy instruments used.
1.1	Yes
2.1	Yes
2.2	Yes. In relation to agriculture.
2.3	Yes. In relation to agriculture.
2.4	Yes. In relation to agriculture.
3.1	Yes. In relation to agriculture.
3.2	Yes. In relation to agriculture.
3.3	Yes. In relation to agriculture.
3.4	Yes. In relation to agriculture.
3.5	Yes
3.6	Yes. Lists a range of policy instruments relevant to agriculture and ecosystem services.
3.7	Yes. References the OECDs Green Growth Strategy and indicators in relation to monitoring.
Recommended by expert	Yes

(8) OECD (2013) What Have We Learned from Attempts to Introduce Green-Growth Policies?

URL	https://www.oecd-ilibrary.org/environment/what-have-we-learned-from-attempts-to-introduce-green-growth-policies_5k486rchlnxx-en;jsessionid=C-lHDZriDIN6haOL8DYEsbJv.ip-10-240-5-23
Purpose	Presents lessons learned from country experiences of developing green growth strategies and policies. Does not present a policy framework, but reviews the implementation of green growth policies in countries.
1.1	Yes
2.1	Yes
2.2	Discusses a range of commodity natural assets.
2.3	No
2.4	No
3.1	This is a summary report as does not go into this much detail on different policies for a range of assets.
3.2	This is a summary report as does not go into this much detail on different policies for a range of flows.
3.3	This is a summary report as does not go into this much detail on different policies for a range of human inputs.
3.4	This is a summary report as does not go into this much detail on different policies for a range of benefits.
3.5	Yes
3.6	Yes
3.7	Yes. Cites a National Green-Growth Policy Framework for developing countries from the OECD (2013), Putting Green Growth at the Heart of Development which includes 'Monitoring and evaluation, assessment'. Discusses indicators and accounts in relation to monitoring.
Recommended by expert	Yes

(9) Bass, S., *et al*. (2013) "Making Growth Green and Inclusive: The Case of Ethiopia"

URL	https://doi.org/10.1787/5k46dbzhrkhl-en
Purpose	A green growth review of Ethiopia focused on existing policies and making recommendations for future green growth work.
1.1	Yes
2.1	Yes
2.2	Focus on energy, forests and land.
2.3	No
2.4	Discusses a few relevant ecosystem services.
3.1	Discusses a few specific policies that could impact forests and land extent, condition and value.
3.2	Discusses policies in relation to energy flows.
3.3	Yes
3.4	Yes. Particularly in relation to air pollution and GHGs.
3.5	Yes
3.6	Yes. Discusses PES.
3.7	Yes. But not in detail.
Recommended by expert	No

(10) Mohammed, E., S. Wang and G. Kawaguchi (2013), "Making Growth Green and Inclusive: The Case of Cambodia"

URL	https://doi.org/10.1787/5k420651szzr-en
Purpose	This report presents a case study on Cambodia, which draws on several sources of information to compile a "snapshot" of the green growth situation today. In particular, qualitative information was gathered through a two-day, multi-stakeholder workshop and through bilateral interviews conducted with relevant actors from both public and private sectors. It also draws on relevant literature to present a balanced picture of the state of play on green growth in Cambodia.
1.1	Yes
2.1	Yes
2.2	Focuses on assets relevant to Cambodia, e.g. forests, energy, agriculture.
2.3	Those ecosystems that are relevant to the commodity assets discussed.
2.4	Not in detail.
3.1	Yes. In relation to forests.
3.2	Discusses some policy instruments that have been used in Cambodia in relation to forests and biodiversity.
3.3	Specific policies not discussed.
3.4	Specific policies not discussed.
3.5	Yes
3.6	Yes. Discusses PES, REDD and ecosystem services valuation.
3.7	Yes. Reference the OECD's Green Growth Strategy and indicators in relation to monitoring.
Recommended by expert	No

(11) OECD (2015) Green Growth in Fisheries and Aquaculture

URL	https://doi.org/10.1787/9789264232143-en
Purpose	This report summarizes the current situation in fisheries and aquaculture, observing that in many parts of the world these sectors are at risk and do not reach their full potential. The report emphasizes the need for a strong, science-based approach to stock management for resource sustainability, combined with a transparent and reactive policy development cycle to ensure that fisheries deliver maximum possible benefits. The report shows that improved regulation to deal with environmental externalities and space competition is key to unlocking future growth potential of aquaculture.
1.1	Yes
2.1	Yes
2.2	Yes. In relation to the marine environment.
2.3	Yes. In relation to the marine environment.
2.4	Mentions a few ecosystem services but does not discuss them comprehensively.
3.1	Discusses policies that would impact condition and value.
3.2	No. Policies not discussed in relation to flows.
3.3	Yes. Policies discussed in relation to investment and employment.
3.4	Yes. Discusses policies for residuals and some benefits.
3.5	Yes
3.6	No
3.7	Yes. Discusses the use of indicators for monitoring.
Recommended by expert	Yes

(12) OECD (2016) Biodiversity Offsets: Effective Design and Implementation

URL	https://doi.org/10.1787/9789264222519-en
Purpose	This report examines the key design and implementation features that need to be considered to ensure that biodiversity offset programmes are environmentally effective, economically efficient and distributionally equitable. In this report, insights and lessons learned are drawn from more than 40 case studies from around the world, with an additional three in-depth country case studies from the United States, Germany and Mexico.
1.1	Natural capital language is not used, but the value of biodiversity benefits to human society is acknowledged.
2.1	Yes
2.2	Focus of report is on biodiversity, rather than a range of natural assets. However case studies discussed cover a range of natural assets.
2.3	Focus of report is on biodiversity, rather than a range of ecosystem assets. However case studies discussed cover a range of ecosystem assets.
2.4	Focus of report is on biodiversity, rather than a range of ecosystem services.
3.1	Focus of this report is on a single policy instrument, biodiversity offsetting. However, offsetting is likely to impact condition, extent and value of natural assets.
3.2	Biodiversity offsetting will likely impact the ecosystem services associated with biodiversity.
3.3	Biodiversity offsetting will likely impact the human inputs associated with wildlife and conservation management activities.
3.4	Biodiversity offsetting will likely impact the benefits associated with biodiversity.
3.5	Biodiversity offsetting is a form of management policy for biodiversity conservation.
3.6	Yes. Biodiversity offsetting does impose additional costs on developers whose activities have adverse impacts on biodiversity.
3.7	Yes. Includes discussion of monitoring of biodiversity offsetting programmes.
Recommended by expert	Yes

(13) OECD (2016) Better Policies for Sustainable Development. A New Framework for Policy Coherence

URL	https://doi.org/10.1787/9789264256996-9-en
Purpose	Presents a framework of aligning and monitoring the coherence of development relevant policies that span multiple sectors including food security, illicit financial flows and green growth. The Framework for Policy Coherence for Sustainable Development ("the PCSD Framework") is designed to help countries implement the 2030 Agenda for Sustainable Development. This report presents a toolkit of self-screening questions for governments to apply an integrated and whole-government approach to green growth.
1.1	Yes. Uses natural capital terminology.
2.1	Discusses assets, ecosystem services, human inputs and outputs.
2.2	Details natural capital as renewable stocks of water, forest and fish resources, and non-renewable stocks as mineral resources. Also discusses soil in relation to agriculture.
2.3	Yes. A range of ecosystem types are cited, but no typology is used.
2.4	Discusses ecosystem services with some specific examples. This is not comprehensive though.
3.1	No
3.2	No
3.3	The 'Toolkit' includes questions about investment but not the social side of human inputs.
3.4	The 'Toolkit' asks if economic, social and environmental policy inter-linkages are considered when policies are designed.
3.5	The 'Toolkit' has a strong focus on the governance of policymaking.
3.6	Cites PES but little other discussion.
3.7	The 'Toolkit' includes questions on policy assessment and asks what methods are in place.
Recommended by expert	No

(14) OECD (2017) Marine Protected Areas: Economics, Management and Effective Policy Mixes

URL	https://doi.org/10.1787/9789264276208-en
Purpose	This report presents good practice insights for effectively managing marine protected areas (MPAs), one of the policy instruments available for the conservation and sustainable use of marine biodiversity and ecosystems. Drawing on the literature and numerous examples from developed and developing countries, this book highlights how the environmental and cost effectiveness of MPAs can be enhanced. It covers issues including the benefits and costs of MPAs, the need for more strategic siting of MPAs, monitoring and compliance, sustainable finance for MPAs, and the need to embed these in a wider policy mix so as to address the multiple pressures on marine ecosystems.
1.1	Natural capital language is not used, but the value of marine environmental benefits to human society is acknowledged.
2.1	Yes
2.2	Discusses commodity assets that are relevant to the marine environment.
2.3	Discusses a range of ecosystem assets in relation to the marine environment.
2.4	Discusses a range of ecosystem services in relation to the marine environment.
3.1	Focus of this report is on a single policy instrument, marine protected areas (MPAs). These are likely to influence extent, condition and value of assets.
3.2	MPAs will likely impact the ecosystem services associated with the marine environment.
3.3	MPAs will likely impact the human inputs associated with marine environment management activities.
3.4	MPAs will likely impact the benefits associated with the marine environment.
3.5	MPAs are a form of management policy for marine environment conservation.
3.6	Discusses with a suite of case studies the valuation of non-market benefits of marine environments. Discusses relevant policy instruments including PES.
3.7	Yes. Discusses monitoring and reporting of MPA effectiveness.
Recommended by expert	Yes

(15) OECD (2017) The Political Economy of Biodiversity Policy Reform

URL	https://doi.org/10.1787/9789264269545-en
Purpose	This report provides insights on the political economy of biodiversity-related policy reforms. It draws on existing literature and four new case studies covering the French tax on pesticides, agricultural subsidy reform in Switzerland, EU payments to Mauritania and Guinea Bissau to finance marine protected areas via conservation trust funds, and individually transferable quotas for fisheries in Iceland. Each case study focusses on the drivers of reform, the types of obstacles encountered, key features of the policy reform, and the lessons learned from the reform experience.
1.1	Does not use natural capital language, but states that ecosystem services 'provide the irre-placeable foundations for life on Earth'.
2.1	Yes
2.2	Discusses case studies and examples related to a range of commodity assets.
2.3	Discusses a range of ecosystem assets in relation to the case studies discussed.
2.4	Discusses a range of ecosystem services in relation to the case studies discussed.
3.1	Discusses a range of policy instruments in relation to a number of case studies and examples that are likely to impact asset extent, condition and value.
3.2	Discusses a range of policy instruments in relation to a number of case studies and examples that are likely to impact ecosystem services.
3.3	Discusses a range of policy instruments in relation to a number of case studies and examples that are likely to impact human activities.
3.4	Discusses a range of policy instruments in relation to a number of case studies and examples that are likely to impact benefits.
3.5	Discusses a range of relevant policy instruments in relation to a number of case studies and examples.
3.6	Yes. Discusses a case study of the EU payments to Mauritania and Guinea Bissau for MPA conservation under the Fisheries Partnership Agreements. Discusses examples of PES.
3.7	Discusses policy impact monitoring in relation to case studies.
Recommended by expert	Yes

(16) Karousakis, K. (2018), Evaluating the effectiveness of policy instruments for biodiversity: Impact evaluation, cost-effectiveness analysis and other approaches

URL	https://doi.org/10.1787/ff87fd8d-en
Purpose	This report provides an overview of methodologies to evaluate the effectiveness of policy instruments for biodiversity, covering impact evaluation, cost-effectiveness analysis and other more commonly used approaches. It then provides an inventory of biodiversity-relevant impact evaluation studies, across both terrestrial and marine ecosystems. The report concludes with lessons learned, policy insights and suggestions for further work.
1.1	No. Out of scope of this report which is focused on effectiveness monitoring of biodiversity policies.
2.1	No. Out of scope of this report which is focused on effectiveness monitoring of biodiversity policies.
2.2	No. Out of scope of this report which is focused on effectiveness monitoring of biodiversity policies.
2.3	No. Out of scope of this report which is focused on effectiveness monitoring of biodiversity policies.
2.4	No. Out of scope of this report which is focused on effectiveness monitoring of biodiversity policies.
3.1	Discusses policies and case studies that are likely to impact asset extent, condition and value.
3.2	Discusses policies and case studies that are likely to impact ecosystem services related to biodiversity.
3.3	Discusses policies and case studies that are likely to impact human inputs.
3.4	Discusses policies and case studies that are likely to impact benefits.
3.5	Discusses policies and case studies that are likely to impact management.
3.6	Yes. Includes case studies of relevant policy instruments such as PES.
3.7	Yes. Report is focused on policy effectiveness monitoring, including impact evaluation and cost-effectiveness analysis.
Recommended by expert	Yes

(17) OECD (2018) Mainstreaming Biodiversity for Sustainable Development

URL	https://www.oecd-ilibrary.org/environment/mainstreaming-biodiversity-for-sustainable-development_9789264303201-en
Purpose	Provides guidance of the mainstreaming of biodiversity into national plans and strategies, and into three sectors: agriculture, forestry and fisheries. Also discusses this topic in relation to development activities in developing countries. Finally, discusses and suggests methods of monitoring biodiversity mainstreaming activities.
1.1	Natural capital is referred to in relation to natural capital accounting, investment, and case studies. However, it is not a strong theme in the report.
2.1	Discusses assets, ecosystem services, human inputs and outputs
2.2	Focusses on agriculture, forestry and fisheries. Lack of discussion of energy and mineral, and water industries.
2.3	There is discussion, with case study examples, of a range of ecosystems, but no typology is used.
2.4	As with ecosystems, there is discussion of a range of ecosystem services, but no typology used.
3.1	Yes. A detailed suite of policy instruments are provided for agriculture, forestry and fisheries.
3.2	Yes. A detailed suite of policy instruments are provided for agriculture, forestry and fisheries.
3.3	Yes. A detailed suite of policy instruments are provided for agriculture, forestry and fisheries
3.4	Yes. A detailed suite of policy instruments are provided for agriculture, forestry and fisheries.
3.5	Yes. Discusses several types of natural capital management policies accompanied by case studies.
3.6	Yes. In the greatest detail of the reports reviewed, probably due to the focus on biodiversity which typically does not have a market value.
3.7	Yes. Includes in depth discussion of need for monitoring and evaluation of biodiversity mainstreaming. Includes discussion of how to do this, such as using indicators.
Recommended by expert	No

(18) OECD (2018) Tracking Economic Instruments and Finance for Biodiversity

URL	https://www.oecd.org/environment/resources/Tracking-Economic-Instruments-and-Finance-for-Biodiversity.pdf
Purpose	Reports statistics on the national implementation of biodiversity-relevant policy instruments from data collated in the Policy Instruments for the Environment (PINE) database.
1.1	No. Out of scope of this report which is focused on implementation of biodiversity policies.
2.1	No. Out of scope of this report which is focused on implementation of biodiversity policies.
2.2	References a range of commodity assets in relation to use of different policy instruments and case studies.
2.3	References a range of ecosystem assets in relation to use of different policy instruments and case studies.
2.4	References a range of ecosystem services in relation to use of different policy instruments and case studies.
3.1	Discusses policies and case studies that are likely to impact asset extent, condition and value.
3.2	Discusses policies and case studies that are likely to impact ecosystem services related to biodiversity.
3.3	Discusses policies and case studies that are likely to impact human inputs.
3.4	Discusses policies and case studies that are likely to impact benefits.
3.5	Discusses policies and case studies that are likely to impact management.
3.6	Yes
3.7	No. Out of scope of this report which is focused on implementation of biodiversity policies.
Recommended by expert	Yes

(19) OECD (2019) Biodiversity: Finance and the Economic and Business Case for Action

URL	https://www.oecd.org/environment/resources/Tracking-Economic-Instruments-and-Finance-for-Biodiversity.pdf
Purpose	Reports statistics on the national implementation of biodiversity-relevant policy instruments from data collated in the Policy Instruments for the Environment (PINE) database.
1.1	No. Out of scope of this report which is focused on implementation of biodiversity policies.
2.1	No. Out of scope of this report which is focused on implementation of biodiversity policies.
2.2	References a range of commodity assets in relation to use of different policy instruments and case studies.
2.3	References a range of ecosystem assets in relation to use of different policy instruments and case studies.
2.4	References a range of ecosystem services in relation to use of different policy instruments and case studies.
3.1	Discusses policies and case studies that are likely to impact asset extent, condition and value.
3.2	Discusses policies and case studies that are likely to impact ecosystem services related to biodiversity.
3.3	Discusses policies and case studies that are likely to impact human inputs.
3.4	Discusses policies and case studies that are likely to impact benefits.
3.5	Discusses policies and case studies that are likely to impact management.
3.6	Yes
3.7	No. Out of scope of this report which is focused on implementation of biodiversity policies.
Recommended by expert	Yes

(20) OECD (2019) OECD Environmental Performance Reviews. OECD Green Growth Policy Review of Indonesia 2019

URL	https://doi.org/10.1787/1eee39bc-en
Purpose	The OECDs first Green Growth Policy Review, which builds on the OECDs Environmental Performance Review methodology, to assess Indonesia's policy framework for green growth.
1.1	Yes
2.1	Yes
2.2	Yes
2.3	Yes. Discusses the ecosystem types present in Indonesia with a focus on forest, peat, coastal and marine ecosystems.
2.4	Yes. Discusses a wide range of ecosystem services.
3.1	Yes. Advises to developing NC accounts for valuation of natural assets. Includes a suite of policies relevant to condition and quantity of forests, peatlands and land.
3.2	Not comprehensively in terms of types of ES. Makes recommendation: 'Use system of support measures to incentivize the provision of ecosystem services, such as those provided through sustainable forest management.' Makes recommendation on agricultural yield.
3.3	Makes some recommendations in relation to investment and environmental education.
3.4	Yes. Includes recommendations on emissions and waste, air quality, water access.
3.5	Yes. Makes five recommendations specifically on environmental governance and monitoring. Makes additional recommendations relevant to management of natural assets.
3.6	Yes. Discuses ES valuation through accounting, PES and Ecosystem Restoration Concessions.
3.7	Yes. Discusses need for policy monitoring and advises that a monitoring framework is established to monitor progress towards green growth. Does not go into more depth about how to do this though.
Recommended by expert	No

(21) OECD (2019) Addressing Industrial Air Pollution in Kazakhstan: Reforming Environmental Payments Policy Guidelines

URL	https://doi.org/10.1787/0e04ea86-en.
Purpose	Building on OECD previous analysis, this publication shows that Kazakhstan's environmental payments (environmentally related taxes, non-compliance penalties and compensation for damage regulation) for industrial air pollutants, as currently applied, impede energy efficiency and pollution abatement with heavy-handed non-compliance responses and focus on rising revenues. This report provides guidelines for reform drawing from air pollution regulations in OECD member countries and the results of the analysis of the system in Kazakhstan carried out by the OECD in close co-operation with the Government of Kazakhstan.
1.1	Yes
2.1	Yes. It is also one of the only reports I have read which links the condition of natural capital to human inputs, by discussing the impact of air pollution on human productivity and migration
2.2	Focus on energy.
2.3	Not much discussion of ecosystems.
2.4	Those related to air quality.
3.1	Not a strong focus on assets.
3.2	Not a strong focus on flows.
3.3	Not a strong focus on human inputs.
3.4	The focus of the report is on air pollution so the majority of policy is discussed in relation to residuals.
3.5	Most policies are focused on air quality management.
3.6	Discusses a case study of Natural Resource Damage Assessment, which deals with ecosystem services
3.7	Yes. Makes recommendations for monitoring and evaluation
Recommended by expert	Yes

(22) Capozza, I. and R. Samson (2019), Towards Green Growth in Emerging Market Economies: Evidence from Environmental Performance Reviews

URL	https://doi.org/10.1787/d5e5b5d7-en
Purpose	This paper provides a cross-country review of progress towards green growth in selected emerging market economies that are members or partners of the OECD. It draws on the country studies conducted within the OECD Environmental Performance Review Programme for Brazil, Chile, Colombia, Indonesia, Mexico, Peru, South Africa and Turkey between 2013 and 2019. It presents the main achievements in the countries reviewed, along with common trends and policy challenges. It provides insights into the effectiveness and efficiency of green growth policy frameworks and measures, which may provide useful lessons for other OECD and partner countries.
1.1	Yes
2.1	Yes
2.2	Those assets relevant to the country case studies.
2.3	Those assets relevant to the country case studies.
2.4	Those flows relevant to the country case studies.
3.1	Those policies relevant to the country case studies.
3.2	Those policies relevant to the country case studies.
3.3	Yes. In relation to investment.
3.4	Yes mainly in relation to residuals.
3.5	Not discussed in much depth.
3.6	Yes. There is discussion of markets for environmental goods and services, economic evaluation of ecosystem services and PES.
3.7	Yes
Recommended by expert	Yes

3. UNEP

(1) UN (2011) Working towards a balanced and inclusive green economy: A United Nations system-wide perspective

URL	https://www.zaragoza.es/contenidos/medioambiente/onu/1209-eng.pdf
Purpose	This is a UN inter-agency report prepared in advance of the Rio+20 conference. It defines the green economy, outlines its importance globally, discusses policy approaches and the role of investment.
1.1	Yes
2.1	Yes
2.2	Lists a range of commodity assets.
2.3	No
2.4	No
3.1	Does not discuss specific policies in relation to different types of natural assets.
3.2	Does not discuss specific policies in relation to different types of flows.
3.3	Strong focus on investment in natural capital and policies relevant to that. Impact of green economy policies on employment is frequently discussed.
3.4	Does not discuss specific policies in relation to different types of outputs.
3.5	Yes. Discusses sustainable agriculture management and sustainable ecosystems management.
3.6	Yes. Discusses PES, carbon pricing, sustainable capital gains.
3.7	Yes. Presents a conceptual framework and discusses methods for monitoring progress towards a green economy.
Recommended by expert	Yes

(2) UNEP (2011) Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication

URL	https://www.greengrowthknowledge.org/resource/towards-green-economy-pathways-sustainable-development-and-poverty-eradication
Purpose	Another report prepared in advance of the Rio+20 conference. This report focuses on green economy investment opportunities in specific natural assets and industries. Also models different green economy investment scenarios.
1.1	Yes
2.1	Yes. Discusses commodity assets, benefits, human inputs, and ecosystem services.
2.2	There is a focus on a number of commodity assets including fisheries, agriculture, water, forests and energy.
2.3	No
2.4	No
3.1	Yes. Discusses policies that would impact asset extent, condition and value.
3.2	Yes
3.3	Strong focus on investment in natural capital and policies relevant to that. Impact of green economy policies on employment is frequently discussed.
3.4	Policies in relation to the economic benefits of ecosystem services, social elements of ecosystem services such as access to water. Impact of green economy policies on residuals discussed frequently.
3.5	Yes
3.6	Yes. Discusses PES and REDD+.
3.7	Yes. Discusses indicators for monitoring the progress towards a green economy shift in the forestry sector.
Recommended by expert	Yes

(3) UNEP (2011) Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers

URL	https://www.unenvironment.org/resources/report/pathways-sustainable-development-and-poverty-eradication
Purpose	A synthesis of the working chapters from the Green Economy Report entitled 'Towards a Green Economy'. It summarizes for policymakers the key findings of the report, describes enabling conditions, and financing the green economy transition. It suggests a few powerful ideas that have emerged from a review of the policies and actions that have proven successful in promoting a green economic transition with national governments and their policy makers specifically in mind.
1.1	Yes
2.1	Yes
2.2	A suite of natural assets are listed, but this is not comprehensive.
2.3	Ecosystems are discussed but different types of ecosystems are not specified.
2.4	Provides an illustrative and diverse list of ecosystem services.
3.1	A range of policy instruments are discussed generally and some case study examples are given that are relevant to natural assets. However, this is not done systematically.
3.2	A range of policy instruments are discussed generally and some case study examples are given that are relevant to flows. However, this is not done systematically.
3.3	A range of policy instruments are discussed generally and some case study examples are given that are relevant to human inputs. However, this is not done systematically.
3.4	A range of policy instruments are discussed generally and some case study examples are given that are relevant to impacts. However, this is not done systematically.
3.5	Yes. Case study examples are provided of policy instruments and their impact on management.
3.6	Payments for ecosystem services are discussed.
3.7	No
Recommended by expert	No

(4) UNEP (2014) A guidance manual for green economy policy assessment

URL	https://www.un-page.org/guidance-manual-green-economy-policy-assessment
Purpose	This manual provides a customized guidance on how to conduct a target-driven Green Economy Policy Assessment (GEPA) in order for policymakers to develop and adopt green economy policies to achieve their sustainable development targets. This is part of a three-report package called the *Green Economy Toolkit for Policymakers (https://www.un-page.org/green-economy-toolkit-policymakers)*. The other reports in the package focus on modelling and indicators of green economy for policymakers.
1.1	Yes. But the term is used only twice and it is not a strong theme.
2.1	Yes
2.2	A suite of natural assets are listed, but this is not comprehensive.
2.3	Ecosystems are discussed but different types of ecosystems are not specified.
2.4	No
3.1	A range of policy instruments are discussed generally and some case study examples are given that are relevant to natural assets. However, this is not done systematically.
3.2	A range of policy instruments are discussed generally and some case study examples are given that are relevant to flows. However, this is not done systematically.
3.3	A range of policy instruments are discussed generally and some case study examples are given that are relevant to human inputs. However, this is not done systematically.
3.4	A range of policy instruments are discussed generally and some case study examples are given that are relevant to impacts. However, this is not done systematically.
3.5	Yes. Policy instruments relevant to management are provided in relation to certain natural assets.
3.6	Payments for ecosystem services are cited as a policy instrument for certain assets and benefits.
3.7	Yes. Details potential methods, and is also accompanied by two reports that go into detail about using modelling and indicators for policy impact assessment.
Recommended by expert	No

(5) UNEP (2014) Green Economy Assessment Study – Burkina Faso

URL	https://www.greengrowthknowledge.org/resource/green-economy-assessment-study-%E2%80%93-burkina-faso
Purpose	This is a national green growth policy review. It is supported by scenario analysis of a suite of green economy policies.
1.1	Yes. But the term is used only twice and it is not a strong theme.
2.1	Yes. It is based on the T21 model, whose conceptual model captures to full concept of natural capital.
2.2	The T21 uses a typology of environment which include the natural assets of land, energy, water and minerals. Other natural assets including soil, other biological resources and aquatic resources are also discussed in reference to relevant sectors.
2.3	Ecosystems are referred to but specific ecosystems are not discussed.
2.4	No
3.1	Yes. In relation to assets relevant to the agriculture and energy sectors.
3.2	Yes. In relation to assets relevant to the agriculture and energy sectors.
3.3	Yes. In relation to assets relevant to the agriculture, energy and mining sectors.
3.4	Discusses the broader green transition impact on social impacts.
3.5	Yes. In relation to assets relevant to the agriculture, energy and mining sectors.
3.6	No
3.7	No
Recommended by expert	No

(6) UNEP (2014) Green Economy Assessment Report – Kenya

URL	https://www.greengrowthknowledge.org/resource/green-economy-assessment-report-kenya
Purpose	This is a national green growth policy review. It is supported by scenario analysis of a suite of green economy policies.
1.1	Yes
2.1	Yes. It is based on the T21 model, whose conceptual model captures to full concept of natural capital
2.2	The T21 uses a typology of environment which include the natural assets of land, energy, water and minerals. Other natural assets including soil, other biological resources and aquatic resources are also discussed in reference to relevant sectors.
2.3	Different ecosystem types are discussed but not systematically.
2.4	No
3.1	Specific policy instruments are discussed in relation to energy, agriculture, water, forests and fisheries. These are not discussed in detail.
3.2	Limited. Policies discussed in relation to carbon and forests and energy provision.
3.3	Yes
3.4	Social impacts and residuals discussed but not in detail.
3.5	Yes. In relation to mining
3.6	No
3.7	Discusses the need for monitoring of policies but doesn't advise on methods for doing this.
Recommended by expert	No

(7) UNEP (2014) Green Economy Assessment Study – Senegal

URL	https://www.greengrowthknowledge.org/resource/green-economy-assessment-study-senegal
Purpose	This is a national green growth policy review.
1.1	Yes
2.1	Yes. It is based on the T21 model, whose conceptual model captures to full concept of natural capital.
2.2	The T21 uses a typology of environment which include the natural assets of land, energy, water and minerals. Other natural assets including soil, other biological resources and aquatic resources are also discussed in reference to relevant sectors.
2.3	Ecosystems are referred to but specific ecosystems are not discussed.
2.4	No
3.1	Discusses policies in relation to energy, agriculture and water, but not in detail.
3.2	Discusses policies in relation to climate change adaptation, but not in detail.
3.3	Discusses policies in relation to investment and employment, but not in detail.
3.4	Discusses policies in relation to residuals
3.5	No
3.6	No
3.7	Discusses the need for monitoring of policies but does not advise on methods for doing this.
Recommended by expert	No

(8) UNEP (2015) Green Economy Assessment Report for Ghana

URL	https://www.greengrowthknowledge.org/resource/green-economy-assessment-report-ghana
Purpose	This is a national green growth policy review.
1.1	No
2.1	Yes. It is based on the T21 model, whose conceptual model captures to full concept of natural capital.
2.2	The T21 uses a typology of environment which include the natural assets of land, energy, water and minerals. Other natural assets including soil, other biological resources and aquatic resources are also discussed in reference to relevant sectors.
2.3	Ecosystems are referred to but specific ecosystems are not discussed.
2.4	No
3.1	Discusses policy instruments in relation to the agriculture, energy and forestry sector, but not in detail.
3.2	No
3.3	Yes. Discusses the impacts of policies on employment in relation to the agriculture, energy and forestry sectors.
3.4	Yes. Discusses the impacts of policies on social, economic and environmental benefits in relation to the agriculture, energy and forestry sectors.
3.5	Yes. In relation to the agriculture, energy and forestry sectors.
3.6	No
3.7	Yes and suggest appropriate indicators.
Recommended by expert	No

(9) Millennium Institute (2016) Threshold 21 (T21) iSDG Model documentation

URL	https://www.millennium-institute.org/documentation
Purpose	A technical document detailing the iSDG model. The iSDG model enables policy makers and planning officials at all levels of governance to understand the interconnectedness of policies designed to achieve the SDGs and test their likely impacts before adopting them. The iSDG model is constructed starting from the well-vetted, time tested and validated Threshold21 (T21) model, covers all the SDGs, and also supports a better understanding of the interconnections of the goals and targets in order to develop synergetic strategies to achieve them.
1.1	No
2.1	Yes. The conceptual frameworks of each 'sector' include a combination of some or all of these elements.
2.2	Includes land, soil, water, energy, and agriculture.
2.3	No
2.4	Includes a few including water and energy supply.
3.1	The role of the document is not to present a policy framework. However, the iSDG model's objective is to inform assessment of policies that would be relevant to natural assets.
3.2	The role of the document is not to present a policy framework. However, the iSDG model's objective is to inform assessment of policies that would be relevant to flows.
3.3	The role of the document is not to present a policy framework. However, the iSDG model's objective is to inform assessment of policies that would be relevant to human inputs.
3.4	The role of the document is not to present a policy framework. However, the iSDG model's objective is to inform assessment of policies that would be relevant to outputs.
3.5	The role of the document is not to present a policy framework. However, the iSDG model's objective is to inform assessment of policies that would be relevant to governance.
3.6	No
3.7	The model assesses potential policy impacts. Not clear if it could be used to conduct assessments of policies that have actually been implemented.
Recommended by expert	Yes

(10) PAGE (2017) The Green Economy Progress Measurement Framework – Methodology

URL	https://www.un-page.org/files/public/gep_methodology.pdf
Purpose	Presents a Green Economy Progress (GEP) Measurement Framework to help countries evaluate their overall progress towards an Inclusive Green Economy and to enable a cross-country comparison of progress.
1.1	Yes
2.1	Not explicitly
2.2	Not comprehensively
2.3	Not comprehensively
2.4	Not comprehensively
3.1	No. Policy is not the focus of this document.
3.2	No. Policy is not the focus of this document.
3.3	No. Policy is not the focus of this document.
3.4	No. Policy is not the focus of this document.
3.5	No. Policy is not the focus of this document.
3.6	No. Policy is not the focus of this document.
3.7	Yes. The focus of the document is on a measurement framework of green economy progress.
Recommended by expert	Yes

(11) Eaton & Sheng (2019) Inclusive Green Economy: Policies and Practice

URL	https://greeneconomytextbook.org/
Purpose	Presents a systematic framework for UNEP's green economy model. It builds on and extends from the traditional economic growth model by articulating the contributions to productivity from investing in natural capital, clean technologies, and green skills, enabled by fiscal, finance, trade and labour policies. It also addresses the importance of institutions and progress measurement for ensuring that transition towards a green economy is pro-poor, inclusive, fair and just.
1.1	Yes. Discusses the concept in depth.
2.1	Yes. Explains these concepts in detail.
2.2	Mentions a range of different types of assets but no typology used. This would not necessarily be relevant for this type of document.
2.3	Same as 2.2
2.4	Same as 2.2
3.1	Discusses some relevant policies but not systematically.
3.2	Discusses some relevant policies but not systematically.
3.3	Discusses some relevant policies but not systematically.
3.4	Discusses some relevant policies but not systematically.
3.5	Discusses some relevant policies but not systematically.
3.6	Yes. Discusses carbon trading, payments for ecosystem services and water 'banks'. Discusses the issues with, and approaches to, valuation of natural capital in detail.
3.7	Yes. Includes a chapter on a progress measurement framework.
Recommended by expert	Yes

4. World Bank

(1) World Bank (2011) From Growth to Green Growth. A Framework

URL	https://openknowledge.worldbank.org/handle/10986/3670
Purpose	A working paper that discusses the concept of green growth, proposes approaches to achieving it, and discusses policies that can be used to implement it.
1.1	Yes
2.1	Yes.
2.2	Yes. A range of commodity assets are discussed in examples and case studies.
2.3	No
2.4	The concept is used but different types are not discussed.
3.1	Discusses the potential impact, with examples, of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.2	Discusses the potential impact, with examples, of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.3	Discusses the potential impact, with examples, of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.4	Discusses the potential impact, with examples, of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.5	Yes. But does not discuss governance systematically in relation to the components or types of natural capital.
3.6	Yes. Discusses with examples policies which include valuation of ecosystem services.
3.7	No
Recommended by expert	No

(2) World Bank (2012) Inclusive Green Growth: The Pathway to Sustainable Development

URL	https://openknowledge.worldbank.org/handle/10986/6058
Purpose	Presents the World Bank's inclusive green growth strategy. Provides step-by-step guidelines, including a checklist, to help analysts and decision-makers structure the process of crafting green growth strategies.
1.1	Yes. Uses a three capitals model of human, natural and physical capitals to organize half of its policy framework.
2.1	Yes. Discusses stocks and services. Considers the social and economic impacts of employment related to green jobs. Also considers outcomes.
2.2	Yes. Although does not follow the SEEA CF classification as was published in the same year.
2.3	No
2.4	Yes
3.1	Discusses the potential impact of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.2	Discusses the potential impact of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.3	Discusses the potential impact of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.4	Discusses the potential impact of different policy instruments on some of these factors. But policies and factors are not discussed systematically.
3.5	Yes. But does not discuss governance systematically in relation to the components or types of natural capital.
3.6	Yes. Discusses the need to value ecosystem services. Discusses PES with case studies and in relation to poverty reduction.
3.7	Yes. Includes steps on policy assessment in their process for crafting a green growth strategy. Discusses policy assessment in relation to some types of natural assets.
Recommended by expert	No

(3) OEDC, World Bank and UN (2012) 'Incorporating green growth and sustainable development policies into structural reform agendas'

URL	https://www.oecd.org/g20/topics/energy-environment-green-growth/G20_report_on_GG_and_SD_final.pdf
Purpose	This report examines how green growth and sustainable development policies can be incorporated into structural reform agendas. The report was prepared in response to the request from G20 finance ministers and central bank governors in their communiqué of 25-26 February 2012 that asked the OECD, with the World Bank and the UN, to prepare a report that provides options for G20 countries on inserting green growth and sustainable development policies into structural reform agendas, tailored to specific country conditions and level of development.
1.1	Yes. Uses natural capital terminology.
2.1	Yes
2.2	Lists a range of natural assets: agricultural lands; subsoil assets (oil, gas, coal, and minerals); forests; water; fisheries; and the atmosphere.
2.3	No
2.4	Lists a range of ecosystem services, including provisioning and regulating services, but this is not comprehensive.
3.1	Yes. Relevant policy instruments are listed but not in relation to specific assets.
3.2	Yes. Relevant policy instruments are listed but not in relation to specific flows.
3.3	Yes. Discusses investment, labour market and skill policies.
3.4	Discusses policies relevant to income distribution issues, health and education.
3.5	Yes. Discusses use of policy instruments to improve natural capital management and for promoting sustainable practices, using examples from forestry and fisheries.
3.6	Yes. Details non-market based policy instruments with examples and common applications, strengths and weaknesses, and conditions for favourable use. Discusses PES.
3.7	Yes. Suggests indicators to measure benefits from green growth policies.
Recommended by expert	No

(4) World Bank (2013) Inclusive Green Growth in Latin America and the Caribbean. LAC opportunities for all

URL	https://openknowledge.worldbank.org/handle/10986/16595
Purpose	Discusses Latin America and the Caribbean Region (LAC) as the world's laboratory for inclusive green growth, and the policies that are required to continue inclusive green growth in the future in this region.
1.1	No
2.1	No
2.2	Focuses on a few stocks: water, energy and agriculture.
2.3	Mentions ecosystems but doesn't discuss in any depth
2.4	No
3.1	Yes. In relation to energy, water and land, but not specific to each factor.
3.2	Yes. In relation to energy, water and land, but not specific to each factor.
3.3	Investment policies are discussed.
3.4	Discusses policies relevant to social benefits (e.g. access to energy and water, resilience), and residuals.
3.5	Yes. Policies related to sustainable agriculture management.
3.6	Yes. Discusses PES.
3.7	No
Recommended by expert	No

(5) World Bank (2013) Turkey Green Growth Policy Paper: Towards a Greener Economy

URL	https://openknowledge.worldbank.org/handle/10986/16088
Purpose	This Green Growth Policy Paper identifies opportunities to better integrate environmental sustainability considerations and related social and economic issues into the mainstream economic growth and competitiveness agenda in Turkey. Modelling analysis is used to assess policy scenarios.
1.1	Yes
2.1	Yes
2.2	Discusses a range of stocks including forests, land, energy and minerals, water, and agriculture.
2.3	Mentions ecosystems but does not discuss in any depth.
2.4	Yes. Lists a number of ecosystem services.
3.1	Yes. In relation to energy, water and land, but not specific to each factor.
3.2	Yes. In relation to energy, water and land, but not specific to each factor.
3.3	Strong focus on policies for human inputs of investment and labour market.
3.4	Strong focus on policies for residuals.
3.5	Yes. Focused on agricultural management.
3.6	Include policies focused on pricing emissions.
3.7	Yes. In relation to a few specific policies. Also cites the OECD framework of indicators for monitoring green growth.
Recommended by expert	No

(6) World Bank (2014) FYR Macedonia Green Growth Country Assessment

URL	https://openknowledge.worldbank.org/handle/10986/19308
Purpose	A green growth country assessment analyses Macedonia's current status on the green growth path, and makes recommendations for progressing on the green growth path in the future. Modelling analysis is used to assess policy scenarios.
1.1	Yes
2.1	No
2.2	Focuses on water, energy, land and soil.
2.3	Mentions ecosystems but does not discuss in any depth.
2.4	No
3.1	Yes. In relation to energy, water and land, but not specific to each factor.
3.2	Yes. In relation to energy, water and land, but not specific to each factor.
3.3	Strong focus on policies for human inputs of investment and labour market.
3.4	Discusses policies focused on residuals.
3.5	Yes. Focused on agricultural and water management.
3.6	No
3.7	No
Recommended by expert	No

(7) World Bank (2014) Green Growth Opportunities for Bhutan

URL	https://openknowledge.worldbank.org/handle/10986/20804
Purpose	The purpose of this note is to provide food for thought in ongoing discussion of growth strategies for Bhutan, and how green growth ideas may contribute to that discussion. The sector discussions include examples of successful efforts in other places for sustainably increasing the economic return from natural capital and efficient management of environmental risks, as experiences from other countries for Bhutan to consider in its deliberations of options and challenges. At the end of each section, we provide suggestions for next steps, drawing on the discussions at the stakeholder consultations in Thimphu in May 2014, to inform the on-going dialogue between the Royal Government of Bhutan and the World Bank on these issues.
1.1	Yes
2.1	Yes
2.2	Lists natural capital including agricultural lands; subsoil assets (oil, gas, coal, and minerals); forests; water; fisheries; and the atmosphere.
2.3	Mentions ecosystems but does not discuss in any depth.
2.4	Yes. Discusses in detail in relation to specific sectors.
3.1	Policies on developing natural capital accounts.
3.2	Yes. In relation to hydropower and water flows.
3.3	Policies on innovation.
3.4	Yes. On both benefits and residuals.
3.5	Yes. On conservation agriculture, protected area management, watershed management and wildlife management.
3.6	Yes. Discusses policies for valuing ecosystem services including PES, with case studies.
3.7	Yes. But does not discuss methods.
Recommended by expert	No

A.2 STRUCTURED CATALOGUE OF NATURAL CAPITAL POLICY OPTIONS

Here we present a structured catalogue of national policies related to natural capital. Based on a review of green growth policy literature and supplemented with literature on national natural capital policy options, we present a structured catalogue of policies related to natural capital. This catalogue is structured around types of government decisions in order that governments can understand what policy options are available in relation to different types of common government decisions. Documents were sourced using the Google search engine with combinations of search terms including 'natural capital', 'green growth', 'green economy', 'blue economy', 'sustainable development', 'policy', 'strategy', 'framework' 'national', 'country' and 'government'. This search was limited to English-language publications. In addition, electronic databases of organizations were searched including the relevant United Nations agencies, Organisation for Economic Co-operation and Development (OECD), regional institutions such as the African Union and the European Union, development banks such as the World Bank and the African Development Bank, intergovernmental organizations such as the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services (IPBES), non-governmental organizations such as World Wildlife Fund for Nature, and networks such as the GGKP and the Natural Capital Coalition. Finally, the reference list of relevant scientific review articles (*(81, 82)*) was searched for references. Using this search method, we identified documents detailing relevant natural capital policy options from a range of countries including Australia *(23)*, Belgium *(81)*, Brazil *(23)*, Burkina Faso *(83)*, China *(23)*, Ecuador *(23)*, Egypt *(23)*, France *(84)*, Ghana *(70)*, India *(30)*, Indonesia *(31)*, Mongolia *(85)*, Mozambique *(27)*, Nepal *(23)*, the Netherlands *(81)*, the Republic of Korea *(23)*, South Africa *(18)*, Spain *(23)*, Turkey *(23)*, the United Arab Emirates *(86)* and the United Kingdom *(81)*.

We identified an abundance and diversity of policy options detailed in these national documents (Table A2). To provide an organization with the diversity of policy options identified, we developed a typology of policy options, based on the broad types of functional decisions that governments make. Alternative typologies could include the types of natural asset or ecosystem service that policies target, which is useful for policies that have a clearly defined asset or ecosystem service of focus, such as *integration of wetlands in land use planning and regulation*, which could be assigned to a wetlands asset class in a typology. However, many policy options are relevant to multiple natural assets and ecosystem services, such as *implementation of national natural capital valuation and accounting*, which would span multiple classes of such a typology. Alternatively, a typology could focus on industrial sectors such as agriculture and mining, but would suffer the same issue with policies than span multiple sectors. We acknowledge that alternative typologies exist such as the OECD's policy guidance for resource efficiency *(87)*. However, this typology is tailored to the needs of environmental regulators in environment ministries, which is too narrowly focused for natural capital decisions and can span multiple government departments. We have developed our typology to be broad enough to be inclusive of all options, and intelligible to public administrators beyond environmental regulators.

Table A2. Functional government decision-making classification of natural capital policy instruments

Function	Natural capital policy instruments
Policy and planning	Integration of wetlands in land use planning and regulation Integrate natural capital into national planning Integration of climate risk in urban planning Integrated land use and transport planning
Regulatory	Development standards, e.g. green building codes, climate resilient standards for infrastructure and building Green/energy efficient standards for government buildings Green procurement policies, including criteria relating to energy efficiency and recycled material requirements In relation to extractives, implementation of International Finance Corporation Performance Standard 6 directives, and compliance with enhanced Extractive Industries Transparency Initiative Auditing, e.g. energy audits Legal reform, e.g. in terms of nuclear power, hydroelectric projects, incorporation of green/energy efficiency features into law Certification, e.g. Forest Stewardship Council, Marine Stewardship Council and Aquaculture Stewardship Council, green building codes Standards and benchmarking, e.g. International Organization for Standardization 50001 energy management standard Restructuring of state owned energy companies Water rights trading Property rights
Finance and investment	Payments for Ecosystem Services Targets Taxes, e.g. tax on charcoal, tax incentives for green tech, incentive regime for renewable energy, carbon pricing, land value capture mechanisms Subsidies: Phase out negative subsidies and create new positive subsidies Green bonds Fiscal incentives, platforms and tools to support business development, particularly small businesses, in the green sector Compensation instruments, e.g. habitat banking Market mechanisms for voluntary actions to provide ecosystem services Create an open access ecosystem services valuation database Encourage new business models and employment activities which are based on the sustainable use of natural capital Encourage businesses to review and value ecosystem services Use of market based instruments for supporting wetland wise use Financing wetland conservation and management Tariffs, e.g. renewable energy feed-in-tariffs for small-scale renewables Creation of instruments and management tools to enhance economic resilience, such as a Sovereign Wealth Fund and a domestic investment plan Incentivize public sector investment in green growth Levy the kWh price to finance heavy investment in clean coal technology

Function	Natural capital policy instruments
Operational	Greening and retrofitting buildings Enhance agricultural soil health and conservation Converting municipal solid waste to energy Construction of industrial facilities to convert fish waste to fishmeal and fish oil along with high-value, high-protein feed stocks Conduct national ecosystem assessments Habitat restoration Build resilience to water-related disasters Mainstreaming sustainable agricultural practices
Technical	Integrate ecosystem service indicators into relevant policy assessments Integrate ecosystem service mapping and assessment into land use planning, decision-making and management Use of cost-benefit analysis in evaluation of projects and policies with impact on ecosystem services Promote solutions that safeguard sustainable multiple use of natural resources and land for different purposes based on the green economy principles Integrate ecosystem service values of wetlands into climate change, flooding, freshwater and agricultural policies Incorporate ecosystem service assessment into Environmental Impact Assessments as standard Maintain and develop indicators, e.g. biodiversity and ecosystems, green building Ecosystem Approach to Fisheries and Rights-based Management in the management of artisanal fisheries Promote reduced impact logging and sustainable charcoal production Promote Integrated Water Resource Management Technology research and development and upgrading, e.g. promotion of clean cooking technologies, coal technology and infrastructure, gas infrastructure, renewables, surplus energy, transport infrastructure and vehicles, new building materials, agricultural energy and water efficiency, applied agricultural research Upgrading of climate data National natural capital valuation and accounting

Our policy options typology of functional government decision types is composed of the following five classes:

- **Policy and planning:** the policy organizes activities required to achieve a particular goal involving the creation and maintenance of policies and plans. This could include policies that guide the integration of natural capital into land use planning.
- **Regulatory:** the policy guides and controls particular public and/or private actors, which can include enforcing government controls and restricting a particular sector. This could include policies that stipulate required standards in relation to natural capital use, such as implementation of IFC PS6 directives for the exploitation of extractives.
- **Finance and investment:** the policy manages money in such a manner to accomplish the objectives of the government. Policies could include the implementation of Payments for Ecosystem Services (PES) schemes, which use financial instruments to maintain flows of ecosystem services.
- **Operational:** the policy brings together material and/or immaterial assets to produce a particular product or service. This could include policies that operationalize the management of natural capital such as soil conservation policies.
- **Technical:** the policy gives advice about and/or improves practice in the management of natural capital. This could include the management of data and statistics such as policies to develop and maintain indicators of natural capital including biodiversity and ecosystems.

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