Climate & Development
Knowledge Network

Green growth: implications for development planning

About this guide

- CDKN aims to help decision-makers in developing countries design and deliver climate compatible development. A challenge for CDKN's core audience – national planners and policy makers in developing countries – is incorporating 'green growth' into a rigorous policy planning process.

- This guide by CDKN aims to support national planners and policy makers in the green growth planning process by focusing on the key role of economics and economic tools.

Leaders have been rethinking their growth and development strategies since 2008 in response to the twin challenges of a global economic downturn and increasing environmental degradation. Policy makers and economic planners are always looking for new ways to stimulate growth, and the rise of environmental issues – particularly climate change – on the global agenda could be an opportunity. 'Green growth' could promote economic development while responding to climate change, loss of natural capital and resources and addressing social or development objectives.

Perhaps more so than conventional economic planning, green growth planning needs to be an iterative process, adapting to local developments over time and responding to the needs of national and local stakeholders. Planners rarely find the planning process straightforward and rely on economic principles and tools to inform the process. Conventional tools and methods, however, may not address environmental and social dimensions adequately or look beyond economic metrics. New tools and methods have emerged and existing ones have also evolved. However, feeding stakeholders' inputs into these tools and using them to obtain stakeholders' buy-in remain key challenges.

A vision for green growth

A strategic and comprehensive economic development plan – at whatever level, whether regional, national, municipal or organisational – should span economic, social and environmental challenges. Until recently, however, the focus for most countries has been skewed towards economic development with too little emphasis on environmental challenges. The call for 'green growth' is, on the one hand, a call for a re-focus on environmental and social challenges and, on the other, a realisation that environmental and economic objectives are not mutually exclusive or conflicting.
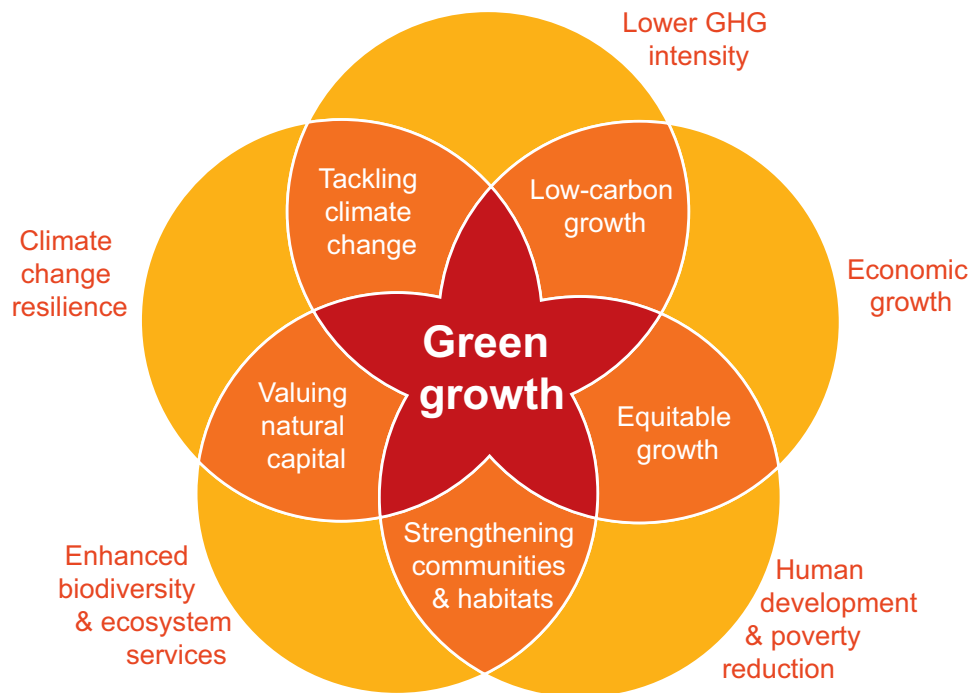
Green growth is a relatively new concept, with varying definitions and names, many of which are focused on linking economic growth and climate change (e.g. Low Emissions Development, Climate Compatible Development). While interpretations and terminology vary, the green growth agenda aims for a number of strategic outcomes alongside economic development. These could include responding to climate change (both emissions reduction and climate resilience), loss of natural capital, resource scarcity, and addressing social or development objectives such as poverty reduction (Figure 1). For an individual country, green growth could

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Figure 1: Potential target outcomes for a 'green economy'

Labels in figure: Lower GHG intensity; Economic growth; Human development & poverty reduction; Enhanced biodiversity & ecosystem services; Climate change resilience; Tackling climate change; Low-carbon growth; Valuing natural capital; Equitable growth; Strengthening communities & habitats; Green growth

mean success on some or all of these, but above all, it is about achieving a balance across potentially competing objectives and recognising potential synergies, such as job creation and investment in new technologies through 'green policies'.

A country's 'green growth vision' needs to be based on local circumstances, political leadership, commitment to international targets, the capacity for change and the priorities of national, local and international stakeholders. Developing countries fall anywhere between two ends of the spectrum: large and emergent economies with plans for economic growth that must be balanced against its impacts on the environment (e.g. on carbon emissions, biodiversity and natural capital); and struggling economies that emphasise economic development, poverty reduction and strengthening resilience (e.g. on climate change, biodiversity losses).

The type and level of ambition may vary, therefore, from country to country. Some may choose to remain focused on economic development but with greater emphasis on environmental preservation. Others may decide that green growth requires a shift in their economic structure. And a few will see 'green' or low emissions sectors as a potential catalyst for growth in new jobs or economic activities. To some countries, a green growth revolution may be a short term plan to boost economic growth, as shown by the amount of 'green' fiscal stimulus during the recent economic recession. For others this may also imply long term structural changes, with green growth embedded not just for the next economic plan but to underpin a country's longer term vision.

Anchoring the vision to a roadmap will help focus minds: a pragmatic development plan will comprise building blocks, milestones and timeframes to support the achievement of the overall vision, and will enable effective monitoring and verification of results. The vision often relates to longer-term structural changes and national positions in international political processes (e.g. 2020 and 2050); whilst the development plan itself will be tied to shorter term national planning and budgeting timescales.

Green growth vs. 'conventional' planning

Planning for 'green growth' should not differ substantially from 'conventional' economic planning. However, planners and decision makers need to include additional considerations during the 'typical' stages of development planning (Figure 2). Perhaps more so than conventional economic planning, green growth planning needs to be an iterative process, adapting to local developments over time and responding appropriately to the needs of national and local stakeholders. Planners rarely find these 'stages' straightforward, and so rely on the use and support of economic principles and tools to inform the process. Conventional tools and methods, however, may not adequately address environmental and social dimensions or look beyond economic metrics.

Planners and decision makers need three key skills.

(1) An understanding of external drivers and influences

Planners need to understand external drivers and influences that affect the outcomes of policy decisions, including the drivers of competitiveness, local political context, private sector reactions, the complexities of the international political process, the ability to secure funding for implementation and the impacts on trade and financial flows.

They may not be able to influence these directly, but the planning process needs to set domestic priorities within the wider context through a pragmatic, consultative and iterative process to ensure relevant outcomes.

Aligning domestic objectives with international developments could include:

- Identifying the relevance of climate finance committed through the Cancun Agreements or other international sources of finance to domestic priorities or projects – implications for emerging economies will differ substantially from those of least developed countries (LDCs)
- Understanding current and future global trade patterns and implications of green growth for domestic stakeholders and key trading partners; and/or
- Recognising the local capacity constraints and the extent of private sector involvement in policy developments.

Figure 2: Planning framework

Stages	Objectives	Key considerations on green growth	
Vision	**Develop the ambition level** ● Agree scope and target outcomes (on growth, emissions, land use etc.) ● Agree time horizon	● What does 'green growth' or 'green economy' mean for the country? ● What are the national priorities? (economy, jobs, environment, people?) ● Who are the stakeholders?	
National baseline assessment and business-as-usual (BAU) scenario development	**Define the baseline and BAU scenario** ● Establish reference scenarios for the baseline position and BAU scenario ● Identify key metrics to measure, monitor and manage	● How does green growth affect 'conventional' growth theories or models? ● What are the drivers of growth under a BAU scenario? ● Do current metrics (e.g. GDP, jobs) suffice? What else needs to be measured? ● What is the emphasis on each metric?	**Iterative process with ongoing and inclusive stakeholder engagement**
Options and interventions development	**Identify potential options and interventions** ● Identify technological options ● Identify barriers and incentives ● Identify policy options	● What are the technology, market, fiscal, policy/ regulatory options available for each target outcome (climate change mitigation and adaptation, growth, poverty alleviation)? ● What are the potential economic, financial and behavioural barriers to implementation? ● Which stakeholders are affected by these policies or interventions?	
Impact analysis	**Analyse and prioritise policies** ● Consider costs and benefits of different options ● Prioritise options and interventions by criteria: e.g. cost-effectiveness	● How would a potential policy option affect a sector/ region/ nation? How sensitive are the outcomes to assumptions? ● What are the displacement or distributional impacts? ● How do different policies interact? ● Are there feedback loops at play?	
Roadmap / plan	**Produce the roadmap / plan** ● Identify the pathway of implementation of preferred approaches	● What are the right governance / institutional structures to deliver the policies? ● Which department(s) is accountable for the delivery of the chosen policies?	
Implementation and capacity building	**Implement the roadmap** ● Build the capacity to deliver ● Secure finance, public-private partnerships	● What human and financial resources are required for delivery? ● How can successful delivery be scaled up? ● Which partners need to be engaged?	

(2) An understanding of the range of potential policy instruments

Planners need to understand the available policy options, including the implications of using market versus non-market instruments. Market instruments may address the lack of financial incentives, but may need to be complemented by non-market based interventions to address other barriers, such as legal or transactional barriers. For example, payment of carbon credits for forest conservation may only be feasible if land and forest use rights can be formally negotiated and legally codified, especially where many and diverse stakeholders are involved.

In practice, identifying the range of available policy options is no small task. It could involve forecasting the feasibility of technological options or changes in the bio-physical environment, or identifying and developing solutions to problems that are not yet apparent, such as the longer term impacts of climate change. A number of recent studies aim to improve understanding in this area, including those from the OECD and UNEP (see Reference section in this paper).

(3) The ability to identify policy impacts

Planners need to be able to identify potential and actual policy impacts in the local context and to set these against a business as usual scenario (the absence of intervention). This means recognising implementation barriers, market and behavioural uncertainty, administrative and transaction costs, and other financial and non-financial risks. Impacts also need to be measured across multiple dimensions, beyond conventional GDP accounting. Planners need to incorporate new metrics to be measured and the 'weights' or importance attached to each metric. They need to understand how the drivers of social, environmental and economic metrics interact over time, and whether these interactions generate feedback loops.

Many tools and methodologies have been developed to address some of these needs, and some mainstream economic methodologies could easily incorporate green growth planning by internalising environmental and social externalities and addressing market imperfections. A forthcoming CDKN study by Ecofys and IDS has identified over 80 such tools, and will provide a comparative analysis of several key methodologies.

Figure 3 presents an overview of major economic tools currently employed to aid green growth planning and an analysis of their strengths and limitations. No approach or methodology is currently dominant among country planners, since each is designed to answer specific questions.

Case study: Development planning in practice

Rwanda's National Strategy on Climate Change and Low Carbon Development

Rwanda, a small landlocked country, has strong GDP growth rates averaging 8.5% in the past five years. Its collective vision for development is embodied in Vision 2020, which seeks to transform the country from a subsistence agriculture economy to a knowledge-based middle income economy by 2020.

The country is highly vulnerable to climate change. Agriculture, employing 80% of the population, is at greatest risk. Rwanda is dependent on hydropower for 50% of its electricity, making it vulnerable to changes in rainfall. It also relies heavily on oil imports and is, therefore, exposed to oil price spikes and energy insecurity.

At the request of H.E. President Kagame and the Government of Rwanda, a nine-month project to develop a National Strategy on Climate Change and Low Carbon Development (NSCCLCD) was launched in November 2010, funded by CDKN and the UK Department for International Development (DFID) Rwanda. Carried out by the Smith School of Enterprise and the Environment (SSEE) at the University of Oxford, the aim is to integrate climate planning into the country's existing development pathway and policy architecture.

In February 2011 the SSEE team produced a Baseline Report that summarised the current status of policies, strategies and projects in key sectors. This led to a series of Sector Working Papers, which look at the Rwandan context but focus on global best practice.

A Strategic Framework is now being developed to propose a vision, guiding principles, strategic objectives and enabling pillars. The resulting Strategy will analyse options to address vulnerabilities to climate change and seize opportunities related to climate change and low carbon development. Looking ahead to 2050, the Strategy will aim to guide national policy and planning, mainstream climate change into all economic sectors, and position Rwanda to receive international finance for climate resilience and low carbon development. It will be the first step in a continuous process that will put Rwanda on course to identify, describe and monitor its vulnerabilities, and take its own action to build resilience and a robust economy.

Source: CDKN

Figure 3: Examples of economic models and tools for green growth planning

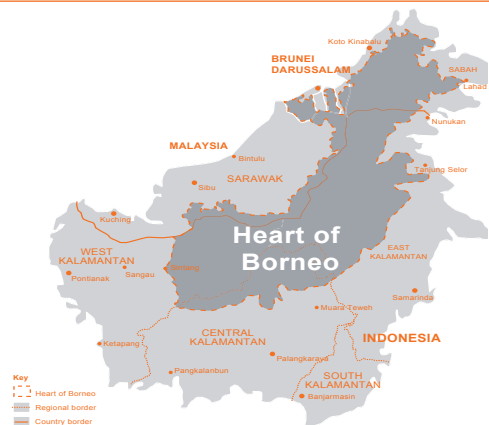| Model	Brief description	Baseline assessment	Options development	Impact analysis	Strengths	Limitations
Macroeconomic models						
Environmentally-extended input-output model (EE-IO)	Spreadsheet-based model snapshot of the economic, environmental and/or social interactions of an economy.	✓		✓	• Can cover economic, environmental and social dimensions • Modelling process reasonably transparent	• Difficult to model changes over time (static modelling) • High resource / data requirements
Dynamic EE-IO with production function	Extension of an EE-IO model over time by specifying an economic growth path.	✓		✓	• Can cover economic, environmental and social dimensions • Can model changes over time • Conducive to stakeholder participation	• High resource / data requirements
Computable General Equilibrium (CGE) model	Programming-based model that estimates economic/ social / environmental reaction to external changes.	✓		✓	• Used for mainstream economic analysis, but can cover economic, environmental and social dimensions • Can model resource reallocation across sectors • Can model changes over time	• Black-box approach – opaque for policy makers • High resource / data requirements • Not conducive to stakeholder participation
Microeconomic / sector-based models						
Environmental valuation modelling	Estimates the value of demand for environmental goods.			✓	• Can capture market and non-market sources of value	• Focused on the environmental dimension • Potentially high resource requirements
Cost-benefit analysis	Approach to evaluate costs and benefits of a project using a common unit, typically discounted to present value terms.			✓	• Used for mainstream economic analysis, helps provide clear rationale for policy decision • Can model scenarios & uncertainties • Able to identify inter-temporal trade-offs	• Requires well-defined assumptions on policy options
Energy-sector/macro model	Combines a conventional macro model (e.g. CGE) with a detailed technology-based model of the energy sector.	✓	✓	✓	• Detailed modelling linking economic growth and GHG emissions	• Limited to economic and climate change mitigation, unable to cover other issues • High resource / data requirements
Marginal Abatement Cost curves	Ranks and estimates the costs for emissions reduction options in order of rising economic cost.		✓	✓	• Output in easily understandable format • Provides comparison across technologies	• Static analysis: abatement at specific point in time • Current focus only on mitigation technologies • Assumes 'least-cost abatement options first'; limits policy implications
Spatial-based models						
Land-use mapping and planning	Geographical representation of current and potential economic / environmental / social activities	✓	✓	✓	• Outputs can feed into on-the-ground decision making	• Potentially hard to integrate outputs into sectoral planning process • Limited replicability across countries
Vulnerability assessment (climate change)	Geographical representation of exposure of areas to expected climate change impacts.	✓			• Outputs can feed into on-the-ground decision making • Can identify local impacts	• Limited linkages into other dimensions of green growth

Sources: CDKN (2011, forthcoming), Miller and Blair (1984), Ecosystem Based Management Tools Network, European Commission (2011), Ekins et al (2011)

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Case study: Testing methodologies on the ground

Towards a green economy in the 'Heart of Borneo'

The 'Heart of Borneo' is a commitment from the governments of Indonesia, Malaysia and Brunei to turn 22 million hectares of Borneo into a green economy. There are ample opportunities for such an economy, but these need to be balanced against the trade-offs:

- Ecotourism can create jobs and provide revenue to support the conservation of natural capital. Ecotourism in Indonesia is growing by 8% per year.
- $1 billion from Norway has been pledged for a verifiable reduction in deforestation in Indonesia.
- Some palm oil companies have yet to develop their concession; land swaps may be needed to compensate them for giving up their licences to convert forest land to agricultural plantations, so that conservation and sustainable use can be established on the forest land instead.
- Sustainable management is needed to maintain logging concessions whilst protecting the natural capital of the region.

A Green Growth plan, being developed by PwC and WWF, assesses opportunity in the 'Heart of Borneo'. A framework has been developed, taking into account strengths and limitations of existing methodologies, to understand and assess green growth opportunities. A core element of the process is to identify issues relevant to the 'Heart of Borneo' and apply relevant tools and methodologies. This includes, for example, recognising the importance of the spatial dimensions, which makes it important to map the location and usage of natural capital in the region.

The development of the plan is an ongoing and iterative process. A number of recommendations have been outlined on the need for more detailed economic modelling including direct application for pilot projects, the development of relevant policies and practices and on capacity building and partnership creation.

The process is underpinned by a stakeholder influencing strategy that identified the key institutions, communities and financiers needed to make the 'Heart of Borneo' a reality, backed by a 'prospectus' to communicate key messages to these stakeholders.

Source: PwC and WWF

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Application challenges of economic tools and methodologies

New economic methods and approaches are being developed, and existing ones continue to evolve, as the limitations of current approaches become more apparent.

Black box and lack of transparency
One key challenge when using these economic models is making the process transparent and the outputs relevant for ministries and departments implementing green growth policies on the ground. The black-box and data-intensive nature of some tools and their outputs make it hard for decision makers to interpret results.

The baseline will vary across different countries, and the same metric or indicator may vary in importance. Differences in the economic structure (e.g. size and role of the rural and informal economy), institutional set-up (e.g. transparency in governance) and cultural influences may also invalidate the assumptions of models built for developed economies.

For example, some of the co-benefits of green growth policies (e.g. reduced local environmental pollution or improved health status) are outcomes that generate disproportionately greater benefits for developing countries compared to developed economies. Bodies such as the World Bank have invested heavily in the development of widely available and user-friendly tools to help build capacity in developing countries.

Lack of data in developing countries
In many developing countries, particularly LDCs, the lack of data availability and resource capacity is a major barrier to the replication of sophisticated analyses or tools. A tailored approach that is pragmatic, transparent and stakeholder-inclusive is, therefore, more likely to suit a low income country. This means combining the rigour of models or methodologies already in place and using local capacity and input to deliver the results or analyses required.

Integration and complementarities of models
Multiple tools or models are often being used to answer different questions. However, application problems could arise when planners attempt to integrate results and interpretations. For example, an understanding of local or regional variations requires spatial tools (e.g. on land-use planning) and sectoral tools (e.g. CGE macroeconomic models), but there is a lack of understanding on how these tools can be integrated.

Progress and next steps

Despite the challenges, decision makers and planning authorities do have access to a wide range of economic tools. What is required is a good understanding of their strengths and limitations, and the selection of those tools that are most relevant to the local context.

It is difficult to get buy-in to deeper, longer, more stakeholder-rich processes, but these are more likely to build momentum and lead to far-reaching policy and implementation benefits in the longer term. The development planning process needs to address the enabling mechanisms for implementation, and to kick-start implementation with demonstration projects. The enabling mechanisms include institutional and technical capacity development, technology transfer, investment mechanisms and the establishment of Measurement, Reporting and Verification (MRV) and other performance measurement systems.

The full process takes many months or indeed years. To promote greater understanding in this area, CDKN provides a platform for knowledge-sharing on green growth, and access to technical assistance and research in planning:

- Visit the CDKN website to join our online debate about the conceptual framing and practical possibilities of green growth, including users' experiences with different tools and methodologies.
- Look out for the CDKN user's guide to planning for climate compatible development (from October 2011), available via our website or by email. This guide, by Ecofys and IDS, will describe the range of tools being used by developing country decision makers worldwide and will help you decide the most suitable tool for you.
- Contact CDKN if you are working in a developing country government that may be eligible for technical assistance (in-kind support) from CDKN to design and deliver climate compatible development. This includes support in applying suitable tools and methodologies on green growth.

For more information on green growth debate and the methodologies listed in this paper

Green growth and green economy

- ESMAP, Low Carbon Growth Country Studies, http://www.esmap.org/esmap/climatechange
- Green Growth Leaders, Shaping the Green Growth Economy, http://greengrowthleaders.org
- OECD, Series of work under Towards Green Growth, http://www.oecd.org/greengrowth
- UN ESCAP, Series of work under Greening of Economic Growth, http://www.greengrowth.org
- UNEP, Towards a Green Economy, http://www.unep.org/greeneconomy
- World Bank, Series of work under Global Green Growth Platform, http://www.worldbank.org

Methodologies

- Burfisher (2011) Introduction to Computable General Equilibrium Models
- CDKN (2011) User-orientated comparative analysis of climate compatible development planning methodologies: A Joint CDKN technical assistance and research project, Ecofys and the Institute for Development Studies, forthcoming August 2011
- Cropper and Oates (1992), Environmental Economics: A Survey, Journal of Economic Literature Vol 30 No 2
- Ecosystem Based Management Tools Network, InVEST (Integrated Valuation of Ecosystem Services and Trade-offs), http://ebmtoolsdatabase.org/tool/invest-integrated-valuation-ecosystem-services-and-trade-offs
- Ekins et al. (2011), Marginal Abatement Cost Curves: A call for caution, UCL Energy Institute

- European Commission (2011), Energy models, http://www.irene-40.eu/sites/default/files/W1IN_DV_5004_%20Annex2.2_REV.A.pdf
- Millennium Institute (2011), A technical introduction to Threshold 21 Integrated Development Model", http://www.millenniuminstitute.net/resources/elibrary/papers/T21brief_technical.pdf
- Miller and Blair (1984), Input-Output Analysis: Foundations and Extensions
- Natural Resources Canada Research Reports (2011), Climate Change Adaptations for Land Use Planners http://adaptation.nrcan.gc.ca/projdb/178_e.php
- Stavins (2008), Environmental Economics, The New Palgrave Dictionary of Economics, Second Edition

For further information on this paper and CDKN

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What is the Climate and Development Knowledge Network?

We are an alliance of six private and non-governmental organisations operating across four continents. Our team includes climate scientists, researchers, economists, consultants, project managers and regional directors. The Network is able to provide support through its alliance organisations as well as procure the best services from around the world.

What support can the Network provide to developing countries?

The Climate and Development Knowledge Network can help decision makers in developing countries by providing support in four areas described below: Research, Technical Assistance, Knowledge Sharing and Partnerships.

We will identify key research gaps and priorities, and commission new policy-relevant applied Research that responds directly to demands from developing country decision makers. Emphasis will be placed on building research capacity of local research institutions and experts, wherever possible.

Our **Technical Assistance** programme will provide tailored and demand driven technical support to developing country governments and other decision makers to:
- Increase the integration of climate resilient and low carbon growth in policy making, planning and implementation
- Increase institutional capacity to leverage climate change financing to achieve maximum impact
- Increase coordination amongst decision makers across sectors and countries to implement climate compatible development

Effective **Knowledge Sharing** is a fundamental pillar of the Network. Our work will be shaped by the demands emerging at country level. We will fill the gaps and connect to existing initiatives, rather than duplicating them. We will make full use of the latest communication tools, organise face-to-face events and use print, video and other formats to reach different audiences.

Partnerships are central to the Network. Across all our work we will seek to foster and support local partnerships, whilst providing access to the best available expertise in the climate change and development field. This approach to convening individuals and organisations around issues of climate compatible development will support capacity building in developing countries.

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