

# Research and Evidence on Green Growth



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## Report Summary

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The DFID-funded Professional Evidence and Applied Knowledge Services for Climate and Environment, Infrastructure and Livelihoods, commissioned ODI to undertake a rapid desk-based study to identify current and recently concluded research on green growth relevant to developing countries, and suggest where further research on these issues could best add value.

There are differences in the definition of Green Growth used by various organisations, but these are mainly in areas of emphasis and are not fundamental. The OECD (2013) describes Green Growth as an approach to economic growth that puts human development at the centre while ensuring that natural assets continue to provide the resources and environmental services to support sustainable development.

Emerging evidence and more hypothetical analysis suggests, that Green Growth can lead to poverty reduction, economic growth, reduced vulnerability to climate change and natural disasters, greater energy security, and more secure livelihoods for those directly dependent on the use of natural resources (World Bank, 2012; ADB/ESCAP/UNEP, 2012; OECD 2013).


The literature on Green Growth is mostly quite recent and dominated by global and industrialised country applications or context. The body of work on definitions and the potential of Green Growth is larger than analysis of experience. In addition to the conceptual and general literature, research on Green Growth issues to date has focused on questions concerned with technology and innovation, trade, jobs, and metrics. Literature on Green Growth issues in low-income countries, and DFID priority countries, is mainly limited to questions of country strategy preparation (e.g. Bass et al, 2013).

Though there is a considerable body of literature describing the need for Green Growth policies and their potential (Lee, 2011; Hallegatte et al., 2011; World Bank, 2012; ADB/ADB, 2013; UNEP, 2013), the case for Green Growth is not universally accepted (Jacobs, 2013). Some of the literature contributes to a continuing debate on the relevance of Green Growth approaches to low-income countries (Dercon, 2012; Resnick et al., 2012). The key point of contention concerns the acceptability or affordability of short-term costs in the expectation of the longer-term gain of environmental sustainability (Strand and Toman, 2010; Hallegatte et al., 2011).

The questions being addressed by current Green Growth research programmes and projects are mostly of a similar nature: general economics, technology and innovation, trade, jobs, and metrics. Research focused on Green Growth issues in developing countries, and particularly Low Income Countries, forms a relatively small component of current research. The Green Growth Knowledge Platform ([www.greengrowthknowledge.org](http://www.greengrowthknowledge.org)), established in 2012, includes the key research institutions and provides a vehicle to share research findings and identify research gaps.

There are a number of gaps in knowledge and research on Green Growth under each of the issue areas of economics, technology and innovation, trade, jobs, and metrics. Gaps in knowledge about the role of the private sector in achieving Green Growth or implementing Green Growth policies are also evident.

Though Green Growth is relevant to DFID objectives, there is a large gap in knowledge and research on the costs and benefits of Green Growth policies for DFID priority countries. The debate on the relevance of Green Growth for LICs suggests that such research needs to be



country-focused. DFID-supported research on the economic, social and environmental costs and benefits of the adoption of Green Growth in LICs, including at macro-, micro-economic and sectoral levels, would fill this gap and inform policy-making in the countries concerned.

A second area where value could be added by DFID is research that assesses the contribution to Green Growth in developing countries of measures that strengthen the sustainable management of natural resources and improve the efficiency of resource use. There is also scope for DFID to support research on the effects on Green Growth of the activities of the local private sector in developing countries and how these might be enhanced.





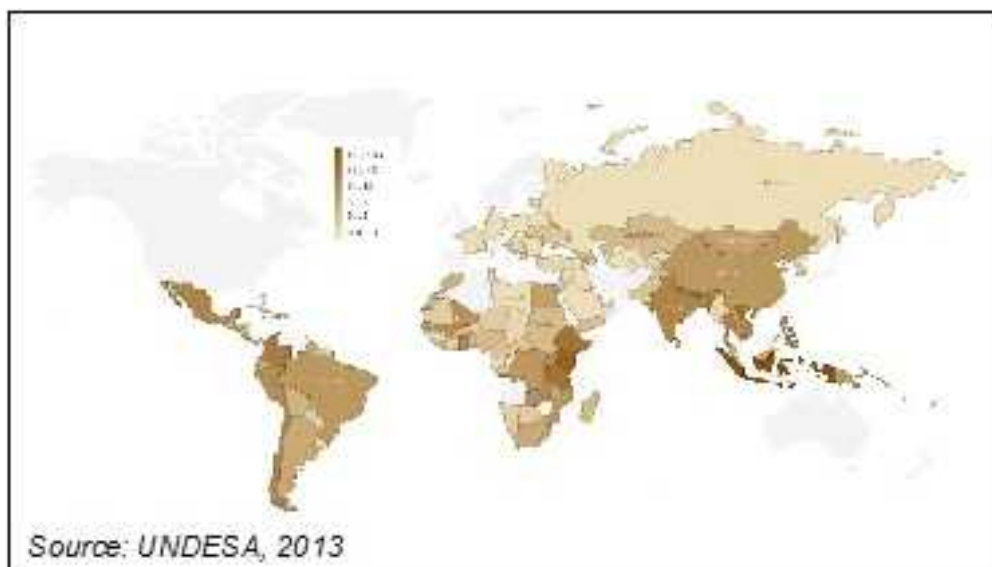
## Introduction

In response to a request from DFID, the Professional Evidence and Applied Knowledge Services for Climate and Environment, Infrastructure and Livelihoods (Evidence on Demand), commissioned a rapid desk-based study to identify current and recently concluded research on green growth. The study was to have two components: firstly, investigation, identification and mapping of recent research on green growth, including effects on the environment and environmental resources and poverty in developing countries; and secondly, identification of the evidence and research gaps in the same area and a brief discussion of where further research by DFID would add most value. This report presents the findings of this rapid study undertaken by ODI<sup>1</sup>, on behalf of DFID through the Evidence on Demand Help Desk service.


The rapid desk-based study identified a range of institutions involved in research, support, and convening on Green Growth issues. Though there is great diversity in the actors involved, a smaller number of organisations and partnerships are leading the debate about Green Growth and publishing research. These include the OECD, the World Bank, the Global Green Growth Institute (GGGI), UNEP and other members of the Green Growth Knowledge Partnership (GGKP).

The type of 'initiatives' these organisations are involved in is also very broad, and categorising them very difficult. The work falls on a spectrum from technical assistance to research, with lots of support and initiatives that could be classified as 'action research' and incorporates elements of research and reflection alongside delivering institutional and policy change. In terms of geographical focus, it is difficult to draw any definitive patterns, however, the map in Figure 1 indicates where initiatives are taking place in the developing world.

**Figure 1 Geographical focus of 'green economy initiatives'**



<sup>1</sup> The ODI team comprised Andrew Scott, William McFarland and Prachi Seth.



The study report briefly discusses in the next section the Green Growth definitional debate and the relevance of Green growth to developing countries and poverty reduction. Research questions in the existing literature are then summarised, followed by a summary of current Green Growth research. In the final section, gaps in knowledge and research are identified along with suggestions for where DFID-funded research could potentially add value. Annexes list the key literature.





# Green Growth and International Development

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The Sustainable Development Knowledge Platform found 13 different definitions of Green Growth in the recent publications of organisations engaged in Green Growth work.<sup>2</sup> Proponents of Green Growth do not, however, differ fundamentally, their differences being in areas of emphasis. Blaxekjaer (2012) identifies two broad groupings: those with a policy concept of Green Growth that is in line with Sustainable Development, emphasising poverty reduction and global equity; and those with a concept that emphasises transformation in industry and energy and the use of public-private partnerships.

The former is expounded by the OECD and the World Bank, while the latter is located in the business community and the Global Green Growth Forum. Bass (2011) suggests there is a third view that recognises limits to growth, and emphasises the transformation and repurposing of growth towards equity and wellbeing. This view is not well represented in recent policy debate, but has a long history outside the mainstream (Victor, 2008).

The OECD (2013) describes Green Growth, in a generally accepted way, as an approach to economic growth that puts human development at the centre while ensuring that natural assets continue to provide the resources and environmental services to support sustainable development.

Differences in the definition of Green Growth potentially provide openings for contesting both policy prescriptions and the underlying concept (Blaxekjaer, 2012). A lack of evidence that variously defined Green Growth policies can simultaneously achieve economic growth, poverty reduction and environmental sustainability, provides further opportunity to contest the approach. Jacobs (2012) points out that “there isn’t a general conclusion that green growth is or is not possible”, successful Green Growth depends on the specifics and on the time frame. In the short term, the economic transformation implied by a Green Growth strategy will generate winners and losers, and its adoption on political economy factors (Jacobs, 2012). Partnership initiatives, such as the Green Growth Knowledge Platform, Green Economy Coalition and Green Growth Leaders, aim to generate and share knowledge about Green Growth in practice, and address the lack of evidence.

The potential relevance of Green Growth for developing countries is reflected in the title of the OECD’s most recent publication on the subject, “Putting Green Growth at the Heart of Development” (OECD, 2013). Wealth and incomes in developing countries are more dependent on natural resources than in OECD countries, and their vulnerability to environmental hazards is greater. Emerging evidence demonstrates, the OECD suggests, that Green Growth can lead to poverty reduction, economic growth, reduced vulnerability to climate change and natural disasters, greater energy security, and more secure livelihoods for those directly dependent on the use of natural resources.

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<sup>2</sup> <http://sustainabledevelopment.un.org/index.php?menu=1447>



## A Brief Review of the Literature

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The literature on Green Growth is mostly quite recent, because significant policy debate on the subject has only taken place since the global financial crisis of 2008. The literature is also dominated by global and industrialised country applications or context. The relative novelty of the policy concept means the body of work on definitions and the potential of Green Growth is larger than analysis of experience. In addition to the more general theoretical and diagnostic literature, the specific areas of technology and innovation, jobs, trade and metrics, feature strongly in the literature to date. (See the tables in the Annex for details of the key literature and the questions addressed in the literature.)


### Green Growth in general

Descriptions and explanations of the potential for Green Growth to address both economic development and environmental sustainability challenges argue that Green Growth is necessary to achieve sustainable development (Lee, 2011; World Bank, 2012; ADB/ESCAP/UNEP, 2012; OECD, 2013). Green Growth is necessary and economically efficient (World Bank, 2012), vital to the future of developing countries, and it can lead to significant economic and social gains (OECD, 2013).

Broadly, Green Growth policies entail bringing environmental factors into economic decision making by introducing considerations of resource efficiency, transforming energy systems, valuing natural capital in the economic calculus, and pricing environmental externalities (Jouvet et al., 2013). The importance of the equitability of Green Growth is emphasised by some authors, highlighting the link between social development and environmental sustainability (Smith et al., 2012; World Bank, 2012). Most countries have development objectives compatible with Green Growth approaches (UNEP, 2013), though the specific strategy for Green Growth will vary between countries (World Bank, 2012).

For many the case for Green Growth remains unproven (Jacobs, 2013). Growth will increase the demand for energy, but fossil fuels are often the least cost source of energy (Sterner, 2011). Schmalensee (2012) suggests that there is little evidence of a threat to economic growth in the short- or medium-term from a depletion of natural capital or unchecked environmental degradation. It is not clear that a transition to a green economy can of itself generate the growth countries are seeking (Huberty et al., 2011), and for developing countries conventional growth may provide a more rapid route out of poverty (Dercon, 2012). Nor is it clear that giving up on economic growth is a necessary condition to tackle the environmental crisis (Janicke, 2012). Promises that green growth will offer a rapid route out of poverty are not very plausible; there may well be less rapid an exit than with more conventional growth strategies.

The critical area of debate concerns the acceptance, or otherwise, of short-term adjustment costs in the expectation of long-term gains (Resnick et al., 2012). Most green policies have an economic cost over the short term, despite the economic benefit from a better environment and natural capital in the long term (Strand and Toman, 2010; Hallegatte et al., 2011). Green Growth policies should reconcile the short and long term, by maximising synergies and mitigating trade-offs across space and time (Hallegatte et al., 2011). Accordingly, the World Bank (2012) suggests Green Growth should focus on what needs to be done in the next five to ten years to generate immediate benefits and avoid getting locked into unsustainable paths.



The theory of green growth cannot determine the question of whether any particular green growth strategy or path will achieve the claims made for it (Jacobs, 2013), and some argue that the conventional tools of neo-classical economics have severe limitations for incorporating environmental considerations into economic policy (Kosoy et al., 2012).

## Green Growth in developing countries

The limited literature specifically on developing countries is largely concerned with the potential of Green Growth policies, emerging economies, and the formulation of Green Growth strategies. Green Growth has been proposed as way for rapidly growing emerging economies, such as Brazil, China, India and Indonesia, to address greenhouse gas emissions and environmental degradation that their growth has brought (Jupesta et al., 2011; ADB/ADB, 2013). Ellis et al. (2012) suggest there will be lessons to be learnt from their experience. Green Growth strategies have been developed for low-income countries may require strengthening to fully address environmental and social issues, as Bass et al. (2013) found in Ethiopia. For Malawi, Mozambique and South Africa, Resnick et al. (2012) suggest that Green Growth policies may be inconsistent with their comparative advantages and past investments, economically costly and face popular resistance.

## Technology and innovation

Achieving poverty reduction, economic growth and environmental sustainability will require innovation and the adoption of new green technologies. The suppliers of technology, however, are mostly located in industrialised countries and in emerging economies the development of new technologies is limited (Glachant, 2013). A case can therefore be made for supporting innovation in green activities (e.g. redirecting R&D subsidies, carbon taxes) (Ploeg et al., 2012). Reviewing over 160 international initiatives to support developing country innovation, Hultman et al. (2013) find that most have neither achieved scale, nor materially influenced development trajectories.

## Trade

The literature on international trade and Green Growth is generally framed in terms of the 'green economy'. Global trends towards greening economies are likely to alter current patterns of competitiveness (Fankhauser et al., 2013). Increasing trade can be consistent with a green economy, and international trade could facilitate a green economy transition. Developing countries with abundant renewable resources are well-positioned to capitalise on the opportunities presented by the greening of economies (UNEP, 2013). Resnick et al. (2012), however, suggest that Green Growth policies may be inconsistent with the comparative advantages of Malawi, Mozambique and South Africa.

## Jobs

There is evidence and research both supporting and arguing against the notion that Green Growth provides jobs and increases incomes (Schmalensee, 2012). Most of the literature focuses on direct employment created, with more cursory treatment of indirect and induced job creation (Bowen, 2012). In the energy sector, Green Growth policies are likely to be more labour intensive than growth sustained by traditional fossil fuels (Stietska-Illina, 2011; Bowen, 2012; Cai, 2012). Mitigation policies in China's power sector resulted in 472,000 net job gains between 2006 and 2010 (Cai et al., 2011). Skills development is critical to unlocking the employment potential of green growth, but labour policies and environmental policies are often dealt with in isolation from one another (Stietska-Illina et al., 2011).



## Measurement and indicators

Many of the impacts of development upon the environment can be reflected in economic accounts (e.g. the productivity of labour affected by environmental health problems, and reduced productivity of agro-ecosystems), but some do not enter the accounts at all. While the theoretical structure for expanding the accounts has been laid out in various reviews, the empirical challenge of doing so is substantial (Reilly, 2012).

Adjusted Net Savings (ANS) measures the real difference between production and consumption, taking into account investments in human capital, depreciation of fixed capital, depletion of natural resources, and damages caused by pollution. South Asia has displayed consistently strong ANS rates, fluctuating between 10% and 20% since 1985, with India dominating the aggregate figure. In Sub-Saharan Africa, ANS has not only declined in recent years but dipped below zero, suggesting unsustainable development and declining wealth (Reilly, 2012).

## Urbanisation

Given Africa's demographics and projected urbanisation, Green Growth provides a policy approach to create sustainable and inclusive economic growth for its increasing urban population. According to Freire (2013) Clean / green urbanisation is cost effective in the short, medium and long term.



## Current Green Growth Research

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Substantial research on Green Growth that is relevant to developing countries is being undertaken by a relatively small number of key organisations. These include the founding members of the Green Growth Knowledge Platform (GGKP) which was established in 2012 by the Global Green Growth Institute (GGGI), OECD, United Nations Environment Programme (UNEP) and the World Bank “to enhance and expand efforts to identify and address major knowledge gaps in green growth theory and practice, and to help countries design and implement policies to move towards a green economy”.

Membership of the GGKP now includes the African Development Bank, Climate & Development Knowledge Network (CDKN), Environment for Development Initiative (Efd), The Growth Dialogue, Local Governments for Sustainability (ICLEI), International Institute for Sustainable Development (IISD), International Trade Centre (ITC), International Labour Organisation (ILO), LEDS Global Partnership, Nordic Development Fund (NDF), Organisation of American States (OAS), United Nations Department of Economic and Social Affairs (UN DESA), United Nations Development Programme (UNDP) and United Nations Industrial Development Organisation (UNIDO).

The Green Growth Knowledge Platform has three programmes of research:

**Innovation and the Adaptation and Diffusion of Green Technologies:** The key research question is the role of technological change in green growth. A particular question is the relationship between technological change and behavioural change for green growth. Additional questions concern methods and policy instruments to foster green innovation (e.g. prizes, advance purchase agreements, price signals and fiscal reform), channels for South-South knowledge sharing, and the barriers to diffusion and adaptation of green technologies in developing countries. The potential for leapfrogging by developing countries, how innovation can be tailored to the needs of poorer people, and spill-over effects between sectors are also questions being considered by the GGKP programme.


**Green Growth, Trade and Competitiveness:** This programme is researching the impacts of green growth policies on the patterns and volume of trade, and impacts on the competitiveness of countries and of firms. Additional questions include the legitimacy of the ‘pollution havens’ hypothesis in developing countries, the risk of trade disputes arising from green growth policies, and methods for realising competitive advantage based on natural capital endowments.

**Green Growth Metrics & Indicators:** This programme will focus on developing a common framework for green growth/green economy indicators and metrics under the GGKP banner, aiming at a set of headline metrics that are informative, measurable, relevant across levels of development, and easy to communicate. OECD, UNEP, and the World Bank are individually very active in this space, so GGKP will convene a group of experts from the three institutions and select partners that will promote harmonisation of their work. In this context, additional behavioural economics research may shed light on the public acceptability of various indicators.

Research by the Global Green Growth Institute focuses on the economics of Green Growth. The research that is relevant to developing and emerging countries covers:

- Green growth planning tools and methodology



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- Lessons from in-country green growth planning experience
  - Economic theory and policy of green growth
  - Resource-efficiency and green growth, including sectoral opportunities and approaches
  - Technological innovation and green growth
  - Employment and poverty reduction
  - Social innovation and welfare and political economy dimensions of green growth
  - International economic cooperation and green growth

GGGI collaborates on research with other organisations. Together with the OECD and International Institute for Environment and Development (IIED), GGGI are preparing a report on “**Green Growth and Developing Countries**” to present channels in which green growth objectives can be achieved and the policies, regulations, technology transfer and new market opportunities that can help deliver them.

GGGI has launched a **Sustainable Energy Trade Agreement (SETA)** research project in cooperation with the Peterson Institute for International Economics and the International Centre for Trade and Sustainable Development. This project is investigating the feasibility of a Sustainable Energy Trade Agreement (i.e. a free trade arrangement covering sustainable energy products and services traded between countries without tariff and non-tariff barriers). The project will develop a detailed set of policy options, which could serve as the basis for such an agreement.

GGGI, in collaboration with the Brookings Institution, the **Green Technology** research programme is researching international mechanisms for green technology innovation in developing countries. A second research area is the international architecture that would extend the pace and diffusion of technological innovation for Green Growth. This includes a survey of ongoing initiatives and proposals to enhance research development and deployment (RD&D) capacity for green growth related technology in the developing world, and identification of approaches to enhance developing country access to intellectual property (IP) that would allow development and diffusion of appropriate technologies for local conditions.

The **Green Growth Best Practices (GGBP)** initiative co-ordinated by GGGI and involving 15 organisations, is conducting a comprehensive analysis of ‘best practices’ with input from over 100 collaborators and authors, to inform green growth decision making. This is due for release in November 2013.

The World Bank’s research on Green Growth issues spans a number of research areas, including those of Climate Change and Energy. Specific programmes include **Low-carbon Economic Growth possibilities** which aims to investigate greenhouse gas emission mitigation options that do not curtail expected economic growth; **Economic valuation of environmental impacts, addressing methods and applications** for assessing the economic costs of environmental degradation and the benefits of improved environmental management; and **Energy, environment and climate change** on the technical, economic, and environmental characteristics of specific energy sources and technologies, and associated policies related to their use. World Bank research is shared through the GGKP.

The OECD’s research focuses on a **measurement** agenda, developing a measurement framework and a preliminary set of indicators for environmental and resource productivity, natural assets, environmental quality of life, and economic opportunities. A key question is the scope of green growth/green economy indicators in relation to other indicators of human and economic development.



The Green Growth programme at the London School of Economics is studying green growth and the long-term challenge of decarbonising the world economy, including the potential for and sources of green growth, implications for jobs, productivity, innovation and policy design. Four research topics are potentially relevant to developing countries

**Business cycles and long-run 'green growth'**, which is analysing how environmental policies can and should take account of business cycles, including questions of risk and uncertainty and whether recessions help or hinder productivity growth and structural change through entry and exit of firms.

**Modelling climate change mitigation, which** aims to advance traditional economic modelling of climate change mitigation, including the use of alternative models of long-run growth in integrated assessment models (IAM)s; analysis of how current generations could be compensated for sacrificing consumption to allow for increased near-term real investment in 'green' technologies; comparison of different approaches to modelling investment flows; and matching up variables in IAM projections more closely with key variables of interest in the study of the other current major growth challenges (such as saving-investment imbalances, government debt and income distribution).

**Low-carbon innovation** is investigating policies to stimulate specifically 'green' innovation, as opposed to innovation more generally. This is focusing on microeconomic research and firm performance.

**Research on 'Green' jobs** is investigating the employment implications of decarbonisation. This takes a macro-economic approach, examining the consequences of decarbonisation for factor demand, over time, under different economic circumstances and in different types of economy, including developing countries. A further question is the interaction of climate change policies, competitiveness and the labour market.



# Evidence Gaps and potential DFID Research on Green Growth

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The research programmes of the Global Green Growth Institute and other members of the Green Growth Knowledge Platform focus on the economics of Green Growth, trade, technology and innovation, and measurement and indicators. There is some research to generate evidence of the effectiveness of Green Growth policies, but this is geared towards their promotion (e.g. the Green Growth Best Practices initiative). Knowledge gaps and areas requiring further are outlined below, based on the outcomes of the Green Growth Knowledge Platform conferences of 2012 and 2013 (GGKP, 2012; GGKP 2013).

## Economics

Behavioural economics could prove to be very useful to test green growth policy options, limiting trials and errors and tackling political barriers. The main knowledge and action gaps in relation to behavioural economics and green growth are as follows:

- An evaluation of policy options based on behavioural and political feasibility criterion in addition to efficiency and equity,
- Involvement of psychologists and political scientists to design and test ensembles of interventions in the field. Behavioural economics can contribute techniques and tools to help address impediments to reform and can contribute to design a better narrative and entrance point for stakeholders,
- Testing theories about human motivation and cognition in developing countries,
- Further research on what has worked so far in fostering behavioural change in developing countries,
- Further impact evaluation of green growth policies, and
- Compilation of best practices on behavioural change.

## Technology and innovation


Areas for future research identified by GGKP are:

- The relationship between technology transfer and absorptive capacity across countries;
- The role of IPRs and specific innovation policy instruments in countries with different income levels and socio-economic contexts;
- The effectiveness of the different financing mechanisms and technology-oriented instruments under international agreements (e.g. CDM).

## Trade

Main knowledge gaps are in the following areas, including i) a distinct analysis for exporting and importing countries, ii) more focus on international harmonisation and standardisation in the context of developing countries, iii) the assessment of policy implications for large and small companies, iv) consideration of policies for public procurement, training and skill development, and v) a further analysis of intended and unintended effects of green growth policies – including the impacts on SMEs, jobs, and social inclusiveness.





Various green economy / green growth support measures such as taxes and subsidies are being employed, both on the production and consumption sides e.g. subsidies are heavily involved with biofuels or electricity-generation throughout the value chain. In order to fully understand the trade implications of such policy measures, however, we must bridge the following information gaps:

- the effects of environmental policies on competitiveness in developing countries,
- interactions between trade openness and depletion of natural capital,
- comparison of models assessing carbon leakage,
- need for a broader toolbox to analyse border tax adjustments,
- empirical evidence on how the Clean Development Mechanism projects affect technology transfer, and
- databases with carbon intensities at the sector and firm level.

## Jobs

There remains a need to improve understanding of the interactions between labour market and environmental policies and objectives, including identification of Green Growth measures that promote decent work. Particular areas for research are:

- Macro-level analysis of the labour market and Green Growth policy measures, allowing cross-country comparisons, and for different types of economy, including developing countries with surplus labour and segmented labour markets;
- Analysis of green jobs at the sectoral level;
- Analysis of who is behind green jobs (type of business, skilled vs unskilled, as well as gender dimension), and identification of skills bottlenecks;
- The labour market consequences of natural resource management policies and practices;
- Review of whether there is scope for targeted labour market policies during the green growth transition vis-à-vis other structural processes (e.g. review of specific policies for sunset industries).

## Private sector

The role of the private sector in Green Growth is now receiving greater attention. Key questions are:

- The benefits and costs of greening value chains, and how to involve different stakeholders in the greening of value chains (e.g. SMEs, local authorities, the role of PPPs).
- The scope for sustainability reporting in the private sector, understanding the business case, including the use of detailed data at product level, and how indicators can be used in risk management and corporate strategy. This links to the harmonisation of metrics and reporting in the private sector.
- The risks and opportunities of Green Growth for SMEs and the informal sector in developing countries, and assessment of their contribution to Green Growth, including as part of the supply chain of larger businesses.
- The short and long-term financial implications of company sustainability practices, including accounting for them and the problem of stranded assets.
- How poor enforcement and inconsistent regulations affect the implementation of activities in developed and developing countries that contribute to Green Growth.

- Analysis of policy disincentives that discourage multinational companies from seeking opportunities in developing countries with weak environmental regulations or regulation enforcement.

## Measurement and indicators

In the area of metrics, the main knowledge gaps are:

- How to value natural capital, particularly biodiversity and ecosystem services, and planetary boundaries, and the related question of how far we should go in measuring natural assets;
- How natural capital accounting can address substitution between capitals, and provide evidence of positive net savings as evidence of sustainability;
- Indicators for Green Growth that capture the social dimension of Sustainable Development;
- How to measure policy interventions that promote green skills, and tax and subsidy reforms.

Further work is also needed to harmonise measurement and reporting metrics, given the large number of approaches proposed in both the private and public sector, and better align private and public sector initiatives on measuring and reporting on green growth (GGKP, 2013). This is related to the need for guidance on Green Growth indicators for governments and statistical offices.


## Green Growth research and DFID

Green Growth has particular relevance to two of DFID's organisational priorities, 'Economic Growth and the Private Sector' and 'Climate and the Environment', and the objectives stated in the 2012-2015 Business Plan to 'Boost wealth creation' and "Combat climate change". Research on Green Growth issues should seek to contribute to these objectives, and to the broader DFID objectives of building knowledge and evidence and being a thought leader in international development.

To date, DFID's priority countries have largely been overlooked by Green Growth research. The exceptions are a small number of countries, such as Ethiopia and Rwanda, where work has focused on the preparation and formulation of Green Growth strategies, and to some extent analysis of the process of strategy development. Analysis of the impacts or potential impacts in low-income countries of Green Growth policy measures, or measures that might be seen as contributing to Green Growth, is lacking. DFID-supported research on the economic, social and environmental costs and benefits of the adoption of Green Growth in LICs would fill this gap and inform policy-making in the countries concerned.

Similarly, research on the costs and benefits of Green Growth policies at the macro- level has not been undertaken for many developing countries. Continuing debate that Green Growth is too costly for LICs and potentially a constraint on their economic development would be informed by country level economic analysis. There is also a need for micro-economic and sectoral analysis of the costs and benefits of Green Growth.

Much of the research on Green Growth has been related to climate change, and focused on emission reduction and the energy sector. There is little research to assess the contribution to Green Growth in developing countries of measures that strengthen the sustainable management of natural resources and the contribution of activities that improve the efficiency of resource use.



Finally, there are gaps in evidence and knowledge about the effects on Green Growth of the activities of the local private sector in developing countries and how these might be enhanced. This includes the business case for taking sustainability into account in company strategy and practices, as well as the sectoral and national contributions to Green Growth of the local private sector.



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Victor P (2008) *Managing Without Growth: Smaller by Design, Not Disaster*, Edward Elgar.

(Details of other references are included in the Annex.)

## Annex 1 Highlighted grey literature publications / highlighted academic literature publications / Primary institutions and research programmes

Table 1 Highlighted grey literature publications

Research paper	Findings	Key words
OECD (2013). <i>Putting green growth at the heart of development. OECD green growth studies</i> . OECD publishing	<p><b>Primary question asked:</b> What types of growth generate wealth and well-being as well as do no harm to the environment?</p> <p><b>Key findings:</b> Pursuit of green growth is vital to future of developing countries and can lead to large economic and social benefits including for the poor. Examples of activities that could deliver this include: sustainable management of forests which 25-50 million low –income households could benefit from; green taxes could sustain natural resources and generate revenues to fund other government priorities; reforms of fossil fuel subsidies would level playing field for clean energy and free up finances to fund other government priorities; growing demand for organic agriculture offers domestic and export market opportunities.</p>	Green growth, inclusive, developing countries
UNEP (2013). <i>Development strategies of selected Latin American and Caribbean countries and the green economy approach: A comparative analysis</i> . Green economy discussion paper. UNEP	<p><b>Primary question asked:</b> what are the comparisons between predominant elements of the development strategies of focus countries with green economy approach as defined by UNEP? What are the concerns expressed with regard to the adoption of a green economy as a pathway towards sustainable development?</p> <p><b>Key findings:</b> Most countries, as the ultimate goal of development strategies, have developed specific concepts of improvement of people and communities that are highly compatible with those proposed by green economy approaches. These goals go beyond material wealth generation and economic growth, and include, amongst other things the fulfilment of people's aspirations in harmony with the rest of society and nature. Social equity is also a key feature. The concerns express by the G77 and China group at Rio +20 with respect to green growth are still relevant.</p>	Green economy, sustainable development, inclusive green growth  Latin America and Caribbean
Hultman, N., Eis, J. and Sierra, K. (2013). <i>International actions to support green growth innovation goals</i> . GGGI and Brookings Institute	<p><b>Primary question asked:</b> How can international cooperation play a critical role in facilitating green innovation and what institutional structures will best enable this support to be scaled up.</p> <p><b>Key findings:</b> Over 160 international initiatives have been created to support developing country innovation activities; however most have neither achieved scale, nor materially influenced development trajectories. Concerns over IP rights and protection are a key stumbling block. Increased focus is needed on innovation as a fundamental driver of green growth, for example by emphasising science and technology capacity building in the post-2015 agenda.</p>	Innovation, capacity building, green growth, development cooperation
The World Bank (2013) <i>The little green data book 2013</i> . The World Bank	<p><b>Primary question asked:</b> What is the state of national environmental and natural resources, in terms of GDP or other conventional indicators? How does Adjusted Net Savings (ANS) support countries to do understand the level or their resources?</p> <p><b>Key findings:</b> ANS measures the real difference between production and consumption, taking into account investments in human capital, depreciation of fixed capital, depletion of natural resources, and damages caused by pollution. The East Asia and Pacific region has maintained the highest savings rate among developing regions since</p>	Natural capital, sustainable development, indicators of growth



Research paper	Findings	Key words
	<p>1980, driven largely by China. South Asia has displayed consistently strong savings rates, fluctuating between 10 and 20 percent since 1985, with India dominating the aggregate figure. Over the past decades, Latin America's rates have remained fairly constant, while Eastern Europe and Central Asia are more variable. In Sub-Saharan Africa, ANS has not only declined in recent years but dipped below zero, suggesting unsustainable development and declining wealth.</p>	
<p><b>Freire, M.E. (2013). <i>Urbanization and green growth in Africa. Green growth series report 1. The growth dialogue</i></b></p>	<p><b>Primary question asked:</b> What would it take for African cities and countries to accommodate the upcoming urban explosion without a negative impact on the environment? Are there opportunities for green growth from urbanisation?</p> <p><b>Key findings:</b> As a combined policy imperative, countries and major cities face the opportunity to drive more efficient growth, lower long-term costs of managing cities, and greater ease of metropolitan management. Given Africa's demographics and projected urbanization patterns, green growth is clearly the superior policy approach to create sustainable and inclusive economic growth for its increasing urban populations. Clean / green urbanization is cost effective in the short, medium and long term. Opportunities include integrated transit / land development and drawing on the power of the private sector. Data and information provision will be increasingly important to monitor the effectiveness of policies.</p> <p><a href="http://www.growthdialogue.org/sites/default/files/publication/documents/Urbanization_and_Green_Growth_in_Africa.pdf">http://www.growthdialogue.org/sites/default/files/publication/documents/Urbanization_and_Green_Growth_in_Africa.pdf</a></p>	<p>Urbanisation, green growth, indicators</p> <p>Africa</p>
<p><b>The World Bank (2012) <i>Inclusive Green Growth: the Pathway to Sustainable Development. The World Bank</i></b></p>	<p><b>Primary question asked:</b> What can be done to achieve economic growth and poverty reduction, and environmental sustainability?</p> <p><b>Key findings:</b> Greening growth is necessary, efficient, and affordable. It is critical to achieving sustainable development and mostly amounts to good growth policies. Obstacles to greening growth are political and behavioural inertia and a lack of financing instruments—not the cost of green policies as commonly thought. Green growth should focus on what needs to be done in the next five to 10 years to avoid getting locked into unsustainable paths and to generate immediate, local benefits. The way forward requires a blend of economics, political science, and social psychology—smart solutions to tackle political economy constraints, overcome deeply entrenched behaviours and social norms, and develop the needed financing tools. There is no single green growth model. Green growth strategies will vary across countries, reflecting local contexts and preferences—but all countries, rich and poor, have opportunities to make their growth greener and more inclusive without slowing it.</p>	<p>Sustainable development</p>
<p><b>Jacobs, M. (2013) <i>Green Growth, in R Falkner (ed), Handbook of Global Climate and Environmental Policy, Oxford: Wiley</i></b></p>	<p><b>Primary question asked:</b> What are the different meanings of the concepts of green growth and related terms such as green economy and sustainable development? How likely is green growth to succeed in increasing the priority given to environmental policy?</p> <p><b>Key findings:</b> Among most countries the dominant economic view is that the case for green growth remains unproven. The theory of green growth cannot determine the question of whether any particular green growth strategy or path will achieve the claims made for it. However, the further ahead the frame of reference used, the</p>	<p>Green growth, economic theory, sustainable development, political discourse</p>





Research paper	Findings	Key words
<b>Blackwell, pp197-214</b>	stronger the case for green growth and the case for green growth can be redefined: it is the case for a growth path which can be sustained over more than just the next few years.	
<b>Dercon, S. (2012). <i>Is green growth good for the poor?</i> Policy research working paper 6231. The World Bank</b>	<p><b>Primary question asked:</b> Are common green-sensitive growth ideas relating to agriculture, trade, technology, infrastructure and urban development consistent with the requirements of poverty reducing growth? What are the distributional changes in costs and benefits of moving towards greener growth?</p> <p><b>Key findings:</b> Promises that green growth will offer a rapid route out of poverty are not very plausible; there may well be less rapid an exit than with more conventional growth strategies. If not explicitly addressed green growth may not be good for the poor. In particular, environmental pricing and regulation could affect the poor as both producers and consumers. Low carbon investments and climate resilience enhancing investments also offer lower chances of reducing poverty.</p> <p><a href="http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-6231">http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-6231</a></p>	Green growth, poverty reduction
<b>Hallegate, S., Heal, G., Fay, M. and Treguer, D. (2011), <i>From growth to green growth – a framework.</i> Policy research working paper 5872. The World Bank</b>	<p><b>Primary question asked:</b> What processes need to happen to make growth process resource efficient, cleaner and more resilient? How can short-term costs be offset to maximise long-term economic co-benefits?</p> <p><b>Key findings:</b> Most green policies have an economic cost over the short term, despite the economic benefit from a better environment and natural capital in the long term. The idea of green growth is to reconcile the short and long term, by maximising synergies and mitigating trade-offs across space and time, and increase social and political acceptability of the policies. By screening policies through checklists that cover: production factors, the production frontier, production efficiency, resilience to shocks and the job content, they can be investigated to identify short term benefits.</p> <p><a href="http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-5872">http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-5872</a></p>	Cost-benefits analysis, green growth
<b>Huberty, M., Gao, H. and Mandell J. (2011). <i>Shaping the green economy: a review of the public debate and the prospects for green growth.</i> The Berkeley Roundtable on the International Economy</b>	<p><b>Primary question asked:</b> How have the public and policy debates over green growth evolved? Does academic research on economic and climate policy support the claims and assumptions made in these debates, and with what consequences for the green growth hypothesis?</p> <p><b>Key findings:</b> Careful scrutiny of the most popular proposals for “green growth” suggests that they may well succeed at reconciling economic growth and emissions reduction. But it’s by no means clear that they offer general proposals for using the transition to a low-carbon economy to generate growth directly. There is also a dissonance between the green growth discussion and the scale of the emissions challenge itself. To replicate these earlier successes, green growth, if it is to deliver on its promises, must go beyond a short-term focus on jobs or investment. Instead, it must put more emphasis on how to structure the low-emissions energy systems transformation to enable the entire economy to discover that transformation’s potential to alter and expand the possibilities for value creation and growth.</p>	Evidence for green growth



Research paper	Findings	Key words
<p><b>Strand, J. and Toman, M. (2010). "Green Stimulus," <i>Economic Recovery, and Long-Term Sustainable Development</i>. Policy research working paper 5163. The World Bank.</b></p>	<p><a href="http://www.sustainia.me/resources/publications/mm/Shaping-the-Green-Growth-Economy_report.pdf">http://www.sustainia.me/resources/publications/mm/Shaping-the-Green-Growth-Economy_report.pdf</a></p> <p><b>Primary question asked:</b> How do the short and long-run effects of green stimulus efforts compare with non-green fiscal stimuli? What are the most beneficial green fiscal programmes</p> <p><b>Key findings:</b> The overall assessment is that most "green stimulus" programs that have large short-run employment and environmental effects are likely to have less significant positive effects for long-run growth, and vice versa, implying a trade-off in many cases between short-run and long-run impacts. There are also trade-offs for employment generation in that programs that yield larger (smaller) employment effects tend to lead to more employment gains for largely lower-skilled (higher-skilled) workers, so that the long term growth effects are relatively small (large). This discussion suggests that the scope for short-run "direct green stimulus" through increased investments in developing countries could be relatively small. This is because most such investment is lumpy and takes time to plan and implement, and a hurried application can be counterproductive as it may turn out to not fully meet each country's required needs. Stimulus through current expenditures which do not directly add to infrastructure may then look more promising. However, significant additional research is needed to better address these questions quantitatively. Ultimately, the results reinforce the point that different instruments are needed for addressing different problems.</p> <p><a href="http://www.sefalliance.org/fileadmin/media/sefalliance/docs/Resources/Green_Economy/2010_World_Bank_WPS5163.pdf">http://www.sefalliance.org/fileadmin/media/sefalliance/docs/Resources/Green_Economy/2010_World_Bank_WPS5163.pdf</a></p>	<p>Green growth, fiscal stimulus, employment</p>
<p><b>Bowen, A. (2012). 'Green' growth, 'green jobs and labor market'. Policy research working paper 5990. The World Bank</b></p>	<p><b>Primary question asked:</b> What are the employment consequences of introducing public policies to correct environmental externalities?</p> <p><b>Key findings:</b> Most of the literature focuses on direct employment created, with more cursory treatment of indirect and induced job creation, especially that arising from macroeconomic effects of policies; however this paper looks at the impacts of green growth policies on labour productivity and costs of employment. The evidence suggests that 'green' growth is likely to be more labour intensive than growth sustained by traditional fossil fuels. For example, renewable energy supply appears to be more labour intensive than fossil-fuel-based supply, per megawatt and per dollar. Energy efficiency improvements also appear to be labour intensive, drawing heavily on relatively unskilled labour in the construction sector. There are many attractive opportunities for developing countries in both these areas. However, the implications of the current lower labour productivity of these activities for public finances, aggregate productivity, energy prices and the profitability of private-sector activity need to be carefully examined.</p> <p><a href="https://openknowledge.worldbank.org/bitstream/handle/10986/3277/WPS5990.pdf?sequence=1">https://openknowledge.worldbank.org/bitstream/handle/10986/3277/WPS5990.pdf?sequence=1</a></p>	<p>Employment, productivity, green growth</p>
<p><b>UNEP. (2013). <i>Green Economy and Trade – Trends, Challenges and Opportunities</i>. UNEP</b></p>	<p><b>Primary question asked:</b> What opportunities and risks does a transition to a green economy pose to developing country export of goods and services? How can improving trade activities also be an affect of and motivator for greening an economy?</p> <p><b>Key findings:</b> International trade, which is a recognised catalyst of growth and economic development, if</p>	<p>Green economy, trade, competitiveness</p>





Research paper	Findings	Key words
	<p>accompanied by appropriate regulation, may lend itself to the role of facilitator of a green economy transition. Indeed, there are clear instances where the opportunities to increase revenues through trade fully coincide with the objectives of a green economy. Sustainable trade practices do exist, and, though are still limited when compared with conventional trade, have become much more prominent in recent years. They can help reduce pressure on natural resources, improve social conditions, help secure market shares and respond to new market trends. Developing countries with abundant renewable resources are well-positioned to capitalize on the opportunities to increase their share in international markets for sustainable goods and services, if such trade can be significantly scaled up. The report also acknowledges the challenges related to sustainable trade opportunities, which in many instances are the same as those existing in conventional trade. In many cases, substantial policy and business constraints need to be overcome as countries embark on a transition to a greener economy.</p> <p><a href="http://unep.org/greeneconomy/GreenEconomyandTrade">http://unep.org/greeneconomy/GreenEconomyandTrade</a></p>	
<p><b>Low, L.P. (2011). <i>Green growth: implications for development planning</i>. CDKN</b></p>	<p><b>Primary question asked:</b> How can economic tools support national policy planners in the green growth planning process?</p> <p><b>Key findings:</b> 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. Planners and policy makers need three key skills: an understanding of external drivers and influences that affect the outcomes of policy decisions, an understanding of the range of potential policy instruments and the implications of using them, and the ability to identify policy impacts in the local context.</p> <p><a href="http://cdkn.org/wp-content/uploads/2011/07/CDKN-Guide-to-Green-Growth.pdf">http://cdkn.org/wp-content/uploads/2011/07/CDKN-Guide-to-Green-Growth.pdf</a></p>	<p>Green growth, planning tools, external impacts on policy</p>
<p><b>Steve Bass, Shannon Wang, Tadele Ferede and Daniel Fikreyesus (2013), <i>Making growth green and inclusive: the case of Ethiopia</i>. OECD green growth papers. OECD</b></p>	<p><b>Primary question asked:</b> what progress has Ethiopia made in 'going green' and what are the next steps in realising the ambitions of its green growth strategy?</p> <p><b>Key findings:</b> the green economy strategy component of Ethiopia's CRGE should be expanded to improve its effectiveness in the long term. This can be done by developing a focus on distributional issues, developing rigorous environmental criteria for all activities within the plan, and creating domestic incentives to guard against uncertain international climate finance. Other potential improvements can be identified, including demonstrating government leadership in policy coherence, providing incentives to all actors to be aware of the potential of green growth sectors, strengthening national research capacity and ensuring national green growth progress contributes to, and draws from, the international green growth debate.</p> <p><a href="http://www.oecd-ilibrary.org/docserver/download/5k46dbzhrkhl.pdf?expires=1374607594&amp;id=id&amp;accname=guest&amp;checksum=212B966A14159A711C8AC5AD4E5D9EE4">http://www.oecd-ilibrary.org/docserver/download/5k46dbzhrkhl.pdf?expires=1374607594&amp;id=id&amp;accname=guest&amp;checksum=212B966A14159A711C8AC5AD4E5D9EE4</a></p>	<p>Green growth, inclusive growth, Ethiopia, Sub-Saharan Africa.</p>
<p><b>Matthieu Glachant (2013), <i>Greening</i></b></p>	<p><b>Primary question asked:</b> What is the state of knowledge on the role of innovation and the diffusion of technologies in the green of global value chains? What are the main policy issues surrounding innovation and technology</p>	<p>Green innovation, climate-mitigation technologies,</p>



Research paper	Findings	Key words
<p><b>Global Value Chains: Innovation and the International Diffusion of Technologies and Knowledge.</b> OECD Green Growth Papers, OECD</p>	<p>diffusion particularly in developing countries?</p> <p><b>Key findings:</b> While economic globalisation leads to knowledge, skill and technology flow, it does not induce the globalisation of innovation, in fact it may hinder it. Technology providers are mostly located in industrialized countries whereas South-South technology transfer is very limited. Statistics show that the role of emerging economies in the development of new technologies is limited, but technology flows through the import of capital goods. The situation of least-developed countries is very different. The report identifies numerous areas for further research.</p> <p><a href="http://www.oecd-ilibrary.org/docserver/download/5k483jn87hmv.pdf?expires=1374608206&amp;id=id&amp;accname=guest&amp;checksum=61D3E3DEF8EE9290C3FD0BBC9082EEC8">http://www.oecd-ilibrary.org/docserver/download/5k483jn87hmv.pdf?expires=1374608206&amp;id=id&amp;accname=guest&amp;checksum=61D3E3DEF8EE9290C3FD0BBC9082EEC8</a></p>	<p>international technology transfer, innovation policy, intellectual property rights, trade,</p>
<p><b>Jeffrey D. Sachs and Shiv Someshwar (2012). Green Growth and Equity in the Context of Climate Change: Some Considerations.</b> Number 371. ADBI Working Paper Series.</p>	<p><b>Primary question asked:</b> What are the evident gaps in available public financing and green growth needs?</p> <p><b>Key findings:</b> Green growth entails several different kinds of processes: conversion to low-carbon energy, climate resilience, and response to climate shocks. Equity implies a fair sharing of the costs, within countries and between countries. The authors set out to explore some of the ways that equity has been considered in climate change discussions. They discuss per capita emission right approaches, and highlight key challenges in the application of equity in global climate change negotiations. They provide a brief overview of key approaches to carbon financing, focusing on some recent cost estimations of potential climate change impacts, as well as of projected needs for green growth programs. The diversity of estimates and present evidence on the apparent gulf between available public financing and green growth needs are highlighted; and considerations of implementing green growth, focusing on building climate resilience and responding to climate shocks are discussed. In conclusion, the authors present one approach to a global Green Fund to receive assessed contributions of member countries and disburse grant and loan fund to low-income and middle-income countries to pursue green growth programs.</p> <p><a href="http://www.adbi.org/files/2012.07.13.wp371.green.growth.climate.change.pdf">http://www.adbi.org/files/2012.07.13.wp371.green.growth.climate.change.pdf</a></p>	<p>Green growth, public financing, global green fund, low-income countries, middle-income countries.</p>
<p><b>Karen Ellis, Stefanie Bauer (GIZ), Pragma Kothari (GIZ), Dominik Weidert (independent expert), Daniel Harris, Alberto Lemma and Zhang Xioaying (IPRCC) (2012). Unlocking business dynamism to promote green (sustainable and</b></p>	<p><b>Primary question asked:</b> What policy and/or donor interventions are succeeding in incentivising or supporting business to invest and innovate in technologies, industries and business models that support green growth? Where is business undertaking such investment of its own accord (without specific policy support) and why? What impact can this investment have on incomes, poverty, jobs, and the environment/carbon emissions? Where has policy failed to achieve desired goals, and why? What are the drivers and constraints to successful policy implementation? What can be done to promote successful policies and approaches in emerging and other countries?</p> <p><b>Key findings:</b> China and India are both large emerging economies that have been enjoying fast economic growth on the back of market liberalisation but are now facing challenges associated with achieving more socially inclusive and environmentally sustainable forms of growth. Both are now recognising the importance of finding ways to achieve this goal, and are innovating with policies and mechanisms to incentivise these new forms of growth. It is clear that there will be many valuable lessons to be learned from this innovation, both within China and India</p>	<p>Economic growth; Climate change; Business and markets; International economic development; Low-carbon growth; Asia; China; India; Research and analytical work.</p>



Research paper	Findings	Key words
<p><b><i>inclusive) growth: learning from innovation in emerging economies.</i></b>  <b>ODI Working Papers 361</b></p>	<p>themselves and in other countries. s both countries move away from command and control models of economic management, towards market-based approaches which incentivise business activity rather than direct it, there will be much to learn from the success or otherwise of the mechanisms that are put in place to incentivise and alter business activity to bring it into line with the wider goals of sustainable and inclusive growth.</p> <p><a href="http://www.odi.org.uk/publications/6973-business-private-sector-markets-growth-green-climate-change-carbon-economic-sustainable-inclusive-innovation">http://www.odi.org.uk/publications/6973-business-private-sector-markets-growth-green-climate-change-carbon-economic-sustainable-inclusive-innovation</a></p>	
<p><b>Timan Santarius (2012). Green Growth Unravelled How rebound effects baffle sustainability targets when the economy keeps growing.</b> Heinrich Böll Foundation and the Wuppertal Institute for Climate, Environment and Energy</p>	<p><b>Primary question asked:</b> What are the different notions and understandings of green growth of green growth?</p> <p><b>Key findings:</b> This paper explores the range of possible rebound effects, outlines their quantitative extent and describes the difficulties encountered by political efforts to contain them. It reveals that there is an urgent need for rebound effects to be taken into account in scientific scenarios and in policy-making.</p> <p><a href="http://www.boell.de/downloads/WEB_121022_The_Rebound_Effect_-_Green_Growth_Unraveled_TSantarius_V101.pdf">http://www.boell.de/downloads/WEB_121022_The_Rebound_Effect_-_Green_Growth_Unraveled_TSantarius_V101.pdf</a></p>	<p>Green growth, rebound effects</p>
<p><b>Jodie Keane and Gareth Potts (2008). Achieving 'Green Growth' in a carbon constrained world.</b> ODI Background Notes.</p>	<p><b>Primary question asked:</b> What are the options available to developing countries in a 'carbon constrained' world?</p> <p><b>Key findings:</b> This Background Note assesses the options available to developing countries in a 'carbon constrained' world. It begins by discussing the emissions reductions mechanisms included within the Kyoto Protocol and the ways in which they can contribute to 'green growth' – economic growth with reduced or neutral greenhouse gas (GHG) emissions. A brief overview of emissions traded through the Clean Development Mechanism (CDM) is followed by an analysis of the geographical distribution of CDM projects and types. Although it is difficult to assess the sustainable development benefits of the CDM, it is clear that some developing countries have gained. Despite this, the future success and continued growth of the CDM is under threat due to the uncertainty surrounding the second commitment period of the Kyoto Protocol. The second section of this Background Note outlines the current state of play of negotiations. Assuming the CDM continues beyond 2012, some of the new initiatives and reforms that are likely to shape the next climate change regime are discussed. This includes the adaptation fund levied at 2% of all CDM transactions (excluding LDCs) agreed at the Climate Change Conference held in Bali, December 2007, sponsored by the United Nations Framework Convention on Climate Change (UNFCCC).</p> <p><a href="http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3326.pdf">http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3326.pdf</a></p>	<p>Economic growth; Climate change; Low-carbon growth; Trade Global trade and financial architecture; Global</p>
<p><b>ADB, ESCAP, UNEP (2012). Green Growth,</b></p>	<p><b>Primary question asked:</b> What are the new insights into Asian and Pacific resources? What are the key actions required that governments can pursue to help bring economic growth strategies in closer alignment with the</p>	<p>Climate change; Environment</p>



Research paper	Findings	Key words
<p><b>Resources and Resilience: Environmental Sustainability in Asia and the Pacific.</b></p>	<p>objective of sustainable development?</p> <p><b>Key findings:</b> This report—Green Growth, Resources, and Resilience—describes an evolving policy landscape characterized by a changing economic reality, rising demand for resources, increasingly apparent impacts of environmental and climate change, and increased risk and uncertainty. The report provides new insights into Asian and Pacific resource use trends and outlines key actions, including reforming economic incentives and promoting more inclusive and adaptive governance approaches, that governments can pursue to help bring economic growth strategies in closer alignment with the objective of sustainable development. It also provides examples of strategies for improving resilience to help deal with the increasing levels of risk faced by societies and economies.</p> <p><a href="http://www.adb.org/publications/green-growth-resources-and-resilience">http://www.adb.org/publications/green-growth-resources-and-resilience</a></p>	
<p><b>Kiah Smith, Peter Utting, Sarah Cook (2012). Green Economy or Green Society? Contestation and Policies for a Fair Transition. UNRISD produced in collaboration with the Friedrich-Ebert-Stiftung</b></p>	<p><b>Primary question asked:</b> What are the conceptual and policy approaches to bring social concerns more centrally into green economy and sustainable development debates?</p> <p><b>Key findings:</b> The paper first examines a wide range of social problems and other issues associated with green economy, reasserting that any development transformation must be both green and fair—leading to a "green society", not just a green economy. But different transition pathways exist, each with different configurations of state, market and society relations, as well as social and developmental implications. The remainder of the paper addresses the key role of social policy, agency and participation in crafting transition paths that are green and fair. The paper argues that comprehensive or transformative social policy, which goes beyond social protection, human capital formation or green jobs by also focusing on redistribution and social reproduction, can play a key role in mitigating unfair consequences, influencing behaviour and transforming patterns of inequality. Achieving a shift towards such policies will depend crucially on addressing the politics of governance itself; specifically, the ways different actors—particularly social movements and those most disadvantaged—contest ideas and policies, participate in governance (that is, in project design and implementation, public policy making and "civil regulation"), and organize and mobilize to resist and influence change. Such arenas of policy and action are crucial both from the perspective of distributional and procedural justice, and for driving deeper structural transformations.</p>	<p>Green economy, social issues, equity</p>
<p><b>Olga Strietska-Ilina, Christine Hofmann, Mercedes Durán Haro, Shinyoung Jeon (2011). Skills for Green Jobs: A Global View. ILO.</b></p>	<p><b>Primary question asked:</b> how can countries moving towards green economies seize the potential for job creation opportunities? What are the dynamics of job creation and loss in different economic sectors?</p> <p><b>Key findings:</b> This study of 21 countries shows that economies moving towards greener production can seize the potential for job creation if they deal effectively with the coming structural change and transformation of existing jobs. It shows that while few new occupations emerge in the transition to greener work, massive change occurs in existing occupations. What is more, changes in skill profiles happen at all levels of qualifications and across all sectors, and require action to make the provision of education and training relevant to labour market needs. While the net employment effects of greening the economy are estimated to be positive, carbon-intensive industries are expected to lose jobs. Successful transitions from old to new, greener industries and occupations will require efficient retraining and skills upgrading. A key element of the transformation must be to target training initiatives to segments</p>	<p>Job creation, labour markets, green growth, greener industries, skills policies</p>



Research paper	Findings	Key words
	<p>of the population typically at a disadvantage in the labour market. Skills development is critical to unlocking the employment potential of green growth, yet skills policies and environmental policies are still often dealt with in isolation from one another. To avoid future skill shortages, the report recommends that countries devise strategies based on well-informed policy decisions, social dialogue, and coordination among ministries and between employers and training providers.</p> <p><a href="http://www.ilo.org/global/publications/books/WCMS_159585/lang--en/index.htm">http://www.ilo.org/global/publications/books/WCMS_159585/lang--en/index.htm</a></p>	





**Table 2 Highlighted academic literature publications**

Research paper	Findings	Key words
<p>(2013). <i>Low-Carbon Green Growth in Asia Policies and Practices</i>. Asian Development Bank and the Asian Development Bank Institute</p>	<p><b>Primary question asked:</b> How can low carbon growth be avenues for Asian countries toward development that decouples economic growth from carbon emissions, pollution, and resource use, and promotes growth that also improve quality of life?</p> <p><b>Key findings:</b> Emerging Asian economies are different from the developed advanced economies as they are experiencing rapid growth rates that need to be decoupled from energy use and emissions, reaping co-benefits in areas such as health. These countries have only recently witnessed an increase in manufacturing and their per capita levels of material consumption remain low. Asia is diverse, with a large and growing population that has given way to consumption-oriented and new lifestyles, environmental degradation, and declining forest cover. There is a lot of innovation in Asia as well as commitments to low-carbon economic development. Inclusive growth remains the primary goal across Asia and there is recognition that green growth can support this.</p> <p><a href="http://www.adbi.org/files/2013.06.28.book.low.carbon.green.growth.asia.pdf">http://www.adbi.org/files/2013.06.28.book.low.carbon.green.growth.asia.pdf</a></p>	<p>Asia, low carbon growth, green growth</p>
<p>Schmalensee, R. (2012). From “Green Growth” to sound policies: An overview. <i>Energy Economics</i> Volume 34, Supplement 1, November 2012, Pages S2–S6</p>	<p><b>Primary question asked:</b> What are the differences in the main interpretations of ‘green growth’? What are the policy implications of current research to date?</p> <p><b>Key findings:</b> There is very little evidence of a near-medium threat to economic growth caused by depletion of natural capital or unchecked environmental degradation. In terms of income and employment, there is evidence and research both supporting and arguing against the notion that green growth provides jobs and increases incomes. The financing gap of transitioning to a low-carbon economy at the speed and scale suggested by the G8 is 30 times greater than the current pledge of \$100 billion a year. The existing literature argues for the importance of careful analysis of energy/environmental policies, particularly ambitious ones claiming to offer huge benefits with little or no cost.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S0140988312002113">http://www.sciencedirect.com/science/article/pii/S0140988312002113</a></p>	<p>Green growth, green economy,</p>
<p>Rick van der Ploeg, Cees Withagen (2013). <i>Green Growth, Green Paradox and the global economic crisis</i>. <i>Environmental Innovation and Societal Transitions</i> Volume 6, March 2013, Pages 116–119</p>	<p><b>Primary Question Asked:</b> How can Green Growth be boosted in a global economic crisis?</p> <p><b>Key Findings:</b> A Schumpeterian case can be made for boosting Green Growth in a global economic crisis – that is supporting innovation in green activities and introducing policies that phase out obsolete, and environmentally degrading practices. The best way to achieve this is a combination of R&amp;D subsidies to redirect growth from polluting to clean economic activities and a credible, rising carbon tax to speed up the transition to the carbon-free era. If a carbon tax is infeasible, renewables subsidies might be a second-best alternative to reduce the duration of the fossil fuel era and curb cumulative carbon emissions despite some adverse, short-run Green Paradox effects.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S2210422412000573">http://www.sciencedirect.com/science/article/pii/S2210422412000573</a></p>	<p>Innovation, green growth, R&amp;D</p>
<p>Martin Jänicke</p>	<p><b>Primary question asked:</b> What are the best practice cases of ‘green growth’ and the conceptual generalisations</p>	<p>Innovation, green growth, R&amp;D</p>



Research paper	Findings	Key words
<p><b>(2012). 'Green growth': From a growing eco-industry to economic sustainability. <i>Energy Policy</i> Volume 48, September 2012, Pages 13–21</b></p>	<p>given by the OECD and other established institutions in Europe and Asia?</p> <p><b>Key findings:</b> There are many questionable assumptions in the discussion of economic growth. One of them is the idea that governments are able to achieve sustained high growth. Another one is the belief that the solution to pressing financial and social problems centres on higher growth. It is also questionable, however, to say that giving up on economic growth as a paradigm is the necessary condition to tackle the environmental crisis. In actuality, solving such problems is about radical growth in environmental and resource-saving technologies. It is also about radical 'de-growth' in products and processes that undermine long-term living and production conditions.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S0301421512003503">http://www.sciencedirect.com/science/article/pii/S0301421512003503</a></p>	
<p><b>John M. Reilly, (2012). Green growth and the efficient use of natural resources. <i>Energy Economics</i> Volume 34, Supplement 1, November 2012, Pages S85–S93</b></p>	<p><b>Primary question asked:</b> How resource depletion and environmental degradation are affecting the economy, and how efforts to reduce the impact of these environmental and resource constraints could improve economic growth and performance.</p> <p><b>Key findings:</b> The relatively new concept of 'green growth' can be fruitfully connected to concepts and theories in neoclassical economics including: market externalities, Ricardian and Hotelling rents, and policies that would correct externalities such as Pigovian taxes or a cap and trade system set to achieve emissions reductions consistent with cost benefit assessment. While environmental effects are often considered to be "non-market," many of the impacts of environment are often reflected in market accounts through damages that might include, for example, less labor (due to environment related health problems), reduced productivity of agroecosystems, or damage to infrastructure and other produced assets. The challenge is to make the environmental connection explicit so as to provide a guide to where changes in policies could provide benefit. However, some damages do not enter the accounts at all, and mainly this is because household labor and leisure time are generally not valued in traditional accounts. Hence the cost of illness in terms of reduced ability to contribute to household activities would be missed in the standard accounts. While the theoretical structure for expanding the accounts has been laid out in various reviews, the empirical challenge of doing so is substantial. Careful attention to expanding National Income and Product Accounts, making it a regular part of government statistical agencies' efforts would improve the foundation for analysis of potential 'green growth' policies and measures.</p> <p><a href="http://hdl.handle.net/1721.1/71152">http://hdl.handle.net/1721.1/71152</a></p>	<p>Green growth, environmental accounting, general equilibrium modelling, natural capital accounting</p>
<p><b>Pierre-André Jouvét, Christian de Perthuis (2013). Green Growth: From Intention to Implementation. <i>International Economics</i></b></p>	<p><b>Primary question asked:</b> How can efficiency; energy transitions; inclusion of the value of natural capital in economic life; and a revision of the scale of risks within the financial system improve green growth approaches?</p> <p><b>Key findings:</b> The economic crises seems blinding the governments and major economic actors toward environmental troubles. Nevertheless, the impacts of population growth and economic expansion have now the potential to disrupt important regulatory functions of global ecological systems. Green growth involves transforming the production and consumption processes in order to maintain or restore these regulatory functions of the planet's natural capital. It requires that environmental factors be treated as an essential factor of production and not merely</p>	<p>Green growth ,environmental economics, political economics, natural capital accounting</p>



Research paper	Findings	Key words
<p><b>Available online 26 June 2013</b></p>	<p>an externality. In practice, this transition depends on advances being made in four areas: widening the concept of efficiency; energy transitions; inclusion of the value of natural capital in economic life; and a revision of the scale of risks within the financial system whose innovations for allocating resources at low cost to green growth would be greatly facilitated by effective pricing of environmental pollution.</p> <p><a href="http://www.chaireconomieduclimat.org/wp-content/uploads/2012/06/12-06-19-GG-engFINAL.pdf">http://www.chaireconomieduclimat.org/wp-content/uploads/2012/06/12-06-19-GG-engFINAL.pdf</a></p>	
<p><b>Peter Bartelmus (2013). The future we want: Green growth or sustainable development? <i>Environmental Development – Article in Press</i></b></p>	<p><b>Key questions asked:</b> Green growth is a key theme of last year 's Rio +20 conference. There is, however, confusion about what should be sustained: Is it all encompassing development? Is it economic growth, greened or otherwise? Or is it human well-being?</p> <p><b>Key finding:</b> This commentary compares these concepts within a framework of sustainability categories. The reality test of measurability points to green growth rather than all-inclusive wealth, welfare or holistic development.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S2211464513000341">http://www.sciencedirect.com/science/article/pii/S2211464513000341</a></p>	<p>Sustainability, green growth, inclusive wealth, well-being, green accounting</p>
<p><b>Sam Fankhauser, Alex Bowen, Raphael Calel, Antoine Dechezleprêtre, David Grover, James Rydge, Misato Sato (2013) Who will win the green race? In search of environmental competitiveness and innovation. <i>Global Environmental Change</i> Available online 21 June 2013</b></p>	<p><b>Key questions asked:</b> Who will win the green race? What are the niches of green competitiveness in each of the eight countries?</p> <p><b>Key finding:</b> This paper combines patent data with international trade and output data in order to investigate who the winners of this “green race” might be. The analysis covers 110 manufacturing sectors in eight countries (China, Germany, France, Italy, Japan, South Korea, UK and the US) using data for the period 2005–2007. We identify three success factors for green competitiveness at the sector level: the speed at which sectors convert to green products and processes (measured by green innovation), their ability to gain and maintain market share (measured by existing comparative advantages) and a favourable starting point (measured by current output). We find that the green race is likely to alter the present competitiveness landscape. Many incumbent country-sectors with strong comparative advantages today lag behind in terms of green conversion, suggesting that they could lose their competitive edge. Japan, and to a lesser extent Germany, appear best placed to benefit from the green economy, while other European countries (Italy in particular) could fall behind. However, the green economy is much broader than the few flagship sectors on which the debate tends to focus, and each country has its niches of green competitiveness.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S0959378013000812">http://www.sciencedirect.com/science/article/pii/S0959378013000812</a></p>	<p>Green growth, competitiveness; green innovation, manufacturing</p>
<p><b>Thomas Sterner, Maria Damon (2011). Green growth in the post-Copenhagen climate. <i>Energy Policy</i> Volume 39, Issue 11,</b></p>	<p><b>Primary question asked:</b> What are the necessary ingredients for a long-term global climate strategy?</p> <p><b>Key finding:</b> Global climate change stands out from most environmental problems because it will span generations and force us to think in new ways about intergenerational fairness. It involves the delicate problem of complex coordination between countries on a truly global scale. As long as fossil fuels are too cheap, climate change policy will engage all major economies. The costs are high enough to make efficiency a priority, which means striving toward a single market for carbon—plus tackling the thorny issues of fairness. Growth, green or not, will boost</p>	<p>Green growth, climate change, equity and inclusive growth</p>





Research paper	Findings	Key words
<p><b>November, Pages 7165–7173</b></p>	<p>demand for energy, and coal is normally the cheapest source. The magnitude of the challenge is greater if we also consider the problems related to nuclear (fission) energy and, in some instances, to bioenergy (such as its competition for land that may be essential for the poor).</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S0301421511006331">http://www.sciencedirect.com/science/article/pii/S0301421511006331</a></p>	
<p><b>Jupesta, J., Boer, R., Parayil, G., Harayama, Y., Yarime, M., Puppim de Oliveira, J.A. and Subramanian, S.M. (2011). Managing the transition to sustainability in an emerging economy: Evaluating green growth policies in Indonesia. <i>Environmental Innovation and Societal Transitions</i> Volume 1, Issue 2, Pages 187–191</b></p>	<p><b>Primary question asked:</b> What is the case of green growth that combines energy mix policy and REDD+ program in Indonesia?</p> <p><b>Key findings:</b> Rapidly growing emerging economies, such as Brazil, China, India and Indonesia have joined the ranks of major industrialized countries as significant emitters of greenhouse (GHG). Their rapid economic growth has, however, brought about considerable environmental degradation, health costs, material damage, and a decrease in agriculture productivity. The notion of ‘green growth’ has been proposed as a way out. This paper examines the case of Indonesia and evaluates its search for green growth through an approach that combines a so-called Energy Mix Policy and a REDD+ program.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S2210422411000311">http://www.sciencedirect.com/science/article/pii/S2210422411000311</a></p>	<p>Emerging economies, energy and climate policy, green growth; Institutional design, sustainable development, REDD+</p>
<p><b>John A. Mathews (2012). Green growth strategies—Korean initiatives. <i>Futures</i> Volume 44, Issue 8, October 2012, Pages 761–769</b></p>	<p><b>Primary question asked:</b> What are the key features of the Korean approach in formulating and implementing a green growth strategy? How does it compare to China’s green development strategy?</p> <p><b>Key findings:</b> Korea has embarked on a far-reaching green growth strategy that promises to lay the foundations for a transition from a predominantly ‘brown’ to a green industrial system. In this paper the key features of the Korean approach to formulating and implementing a green growth strategy are outlined, and the progress achieved so far (2009–2012) is reviewed. Comparisons with China’s green development strategy, as embodied in the 12th Five Year Plan (2011–2015), present themselves – in that both strategies are concerned with industrial restructuring and the building of new growth engines designed to create export platforms for the 21st century. Reductions in levels of carbon emissions flow from these industrial policy initiatives. The paper concludes that the Korean strategy is carefully crafted and implemented with full government commitment and leadership, demonstrating that such commitment is feasible in a democracy. What cannot be guaranteed is continuing commitment from successive political administrations.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S0016328712001449">http://www.sciencedirect.com/science/article/pii/S0016328712001449</a></p>	<p>Green growth strategy, carbon emissions reduction and environmental benefits, China and Korea.</p>



Research paper	Findings	Key words
<p>Wenjia Cai, Can Wang Jining Chen, Siqiang Wang (2011). <b>Green economy and green jobs: Myth or reality? The case of China's power generation sector.</b> <i>Energy</i> Volume 36, Issue 10, Pages 5994–6003</p>	<p><b>Primary research question:</b> What is the relationship between the green economy and green jobs in China? Can the current GHG mitigation policies in China's power generation sector bring more jobs to China?</p> <p><b>Key findings:</b> Using both analytical and input–output models this paper analyses the direct and indirect employment impacts of two main mitigation policies in the power generation sector. This paper proves that the above-mentioned question is not simple. Mitigation policies in China's power generation sector from 2006 to 2009 caused a total of 44 thousand net jobs losses. However, as the share of renewable energy that has an indirect employment impacts increased in 2010, the policies from 2006 to 2010 actually resulted in 472 thousand net job gains. This paper asserts that to ensure the co-existence of green economy and green jobs in China's power generation sector, policy makers should further promote solar PV, biomass and wind technologies. In 2010, for every one percent increase in the share of solar PV generation there could be a 0.68% increase in total employment in China, larger than any other power generation technology. Finally, this paper argues that a matching educational system and personnel structure is also needed.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S0360544211005469">http://www.sciencedirect.com/science/article/pii/S0360544211005469</a></p>	<p>Green economy, green jobs, energy generation, China</p>
<p>Nicolas Kosoy, Peter G Brown, Klaus Bosselmann, Anantha Duraiappah, Brendan Mackey, Joan Martinez-Alier, Deborah Rogers, Robert Thomson (2012). <b>Pillars for a flourishing Earth: planetary boundaries, economic growth delusion and green economy.</b> <i>Current Opinion in Environmental Sustainability</i>, Volume 4, Issue 1, February 2012, Pages 74-79</p>	<p><b>Primary research question:</b> What are the gaps in 'green economy' debates leading up to Rio +20?</p> <p><b>Key findings:</b> In the hue and cry about the 'green economy' leading up to Rio + 20 a number of simple points have been neglected. First, the purposes of the economy have been too narrowly conceived. Second, the role of demand management is vastly underplayed. Third, the assumptions about the nature of reality are inconsistent with contemporary science. Fourth, it is mired in a complex discourse about measurement, which fails to even recognize that all economies are dependent on living within Earth's biogeochemical constraints. Fifth, it uses a conceptual framework laid down in the 18th century and tries to apply it to the Anthropocene. The simple, but to many unthinkable, fact is that you cannot get to a flourishing or even sustainable Earth if you start with the assumptions of neo-classical economics. This is not to say that some of the neo-classical tools are not useful, but that they must be deployed in a framework that it does not and cannot supply.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S1877343512000176">http://www.sciencedirect.com/science/article/pii/S1877343512000176</a></p>	<p>Green Economy, Rio +20, natural capital accounting, measurement and indicators</p>
<p>Tim Jackson, Peter Victor (2011) <b>Productivity and</b></p>	<p><b>Primary research question:</b> What is the concept of productivity in post-growth economies?</p> <p><b>Key findings:</b> It defines the 'productivity trap' that arises from the systematic pursuit of labour productivity and</p>	<p>Post-growth economics, productivity, technology, ecological services, jobs</p>



Research paper	Findings	Key words
<p><b>work in the ‘green economy’: Some theoretical reflections and empirical tests. <i>Environmental Innovation and Societal Transitions</i> Volume 1, Issue 1, Pages 101–108</b></p>	<p>describes two solutions to this trap, each of which has some precedence in economic theory. The first is to reduce working hours – the most frequently cited avenue to combat unemployment in non-growing economies. The second is to engage in structural shifts towards low productivity growth sectors. Using a simple simulation model of the UK economy we illustrate how these two strategies might combine to achieve ‘deep’ carbon emission reduction targets while maintaining high employment.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S2210422411000165">http://www.sciencedirect.com/science/article/pii/S2210422411000165</a></p>	
<p><b>Danielle Resnick, Finn Tarp, James Thurlow (2012). The political economy of green growth cases from Southern Africa. <i>Public Administration and Development</i> Volume 32, Issue 3,</b></p>	<p><b>Primary research question:</b> What are the cost implications of adopting green growth approaches in countries like Malawi, Mozambique and South Africa, especially among the poor?</p> <p><b>Key findings:</b> The concept of Green Growth implies that a wide range of developmental objectives, such as job creation, economic prosperity and poverty alleviation, can be easily reconciled with environmental sustainability. This article, however, argues that rather than being win–win, Green Growth is similar to most types of policy reforms that advocate the acceptance of short-term adjustment costs in the expectation of long-term gains. In particular, Green Growth policies often encourage developing countries to redesign their national strategies in ways that might be inconsistent with natural comparative advantages and past investments. In turn, there are often sizeable anti-reform coalitions whose interests may conflict with a Green Growth agenda. We illustrate this argument by using case studies of Malawi, Mozambique and South Africa, which are engaged in development strategies that involve inorganic fertilizers, biofuel production and coal-based energy, respectively. Each of these countries is pursuing an environmentally suboptimal strategy but nonetheless addressing critical development needs, including food security, fuel and electricity. We show that adopting a Green Growth approach would not only be economically costly but also generate substantial domestic resistance, especially among the poor.</p> <p><a href="http://www.wider.unu.edu/publications/working-papers/2012/en_GB/wp2012-011/">http://www.wider.unu.edu/publications/working-papers/2012/en_GB/wp2012-011/</a></p>	<p>Development policy, green growth, political economy, Southern Africa</p>
<p><b>Diana Furchtgott-Roth (2012). The elusive and expensive green job. <i>Energy Economics</i> Volume 34, Supplement 1, Pages S43–S52</b></p>	<p><b>Primary research question:</b> What are the challenges in defining green jobs across different countries, states, and NGOs?</p> <p><b>Key Findings:</b> The United States, Europe, and non-governmental international organisations are seeking to encourage the creation of green jobs and the use of non-hydropower renewable energy. This paper discusses the challenge in defining green jobs and reviews definitions across different countries, states, and NGOs. The paper describes some of the costs the United States has faced in creating jobs through programs funded by the Departments of Labor and Energy. The paper concludes by comparing the experiences of China and the United States in the use of renewable energy.</p> <p><a href="http://www.sciencedirect.com/science/article/pii/S0140988312002046">http://www.sciencedirect.com/science/article/pii/S0140988312002046</a></p>	<p>Green jobs, evaluation, monitoring and indicators</p>
<p><b>Hyun-Hoon Lee</b></p>	<p><b>Primary research question:</b> What are the reasons for the urgency of shifting the current form of economic growth</p>	<p>Green growth, environmental</p>



Research paper	Findings	Key words
<p><b>(2011). Towards Green Growth in Asia and the Pacific. A keynote paper for a Round Table “Prosperity for Asia’s Billions: Green Growth and Poverty Reduction” at the 14th General Conference of UNIDO, November 29, 2011</b></p>	<p>toward Green Growth? How can Green Growth be achieved? What are the lessons learnt from the Republic of Korea?</p> <p><b>Key findings:</b> This paper argues that that economic policy planners and businesses alike in the region need to believe that there are policies and strategies that can create synergy between economic growth and environmental sustainability. The other crucial concept required for Green Growth is improving eco-efficiency. Eco-efficiency is concerned with both producing and consuming goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological pressures and resource intensity to a level at least in line with the earth’s carrying capacity. Improving eco-efficiency requires the internalization of environmental costs into the price structure and also requires long –term approach. In countries that lack the necessary financial and technical capacity, this will require support through international and regional cooperation. Finally, this paper notes that instead of being the long -term goal of national development, the Green Growth Initiative, along with Inclusive Growth Initiative, should be an important “strategy” to achieve the ultimate, long-term goal of sustainable development.</p> <p><a href="http://cc.kangwon.ac.kr/~hhlee/paper/UNIDO_hhlee_111201_final.pdf">http://cc.kangwon.ac.kr/~hhlee/paper/UNIDO_hhlee_111201_final.pdf</a></p>	<p>sustainability, carrying capacity, environmental pressure, Asia and the Pacific</p>

**Table 3 Primary institutions and research programmes**

Institution	Information on initiatives and research programmes	Primary research questions and objectives
<b>Green Growth Best Practices initiative (GGBP)</b>	<p>GGKP is an effort to assess green growth implementation practices around the world and identify what works best. The initiative is currently conducting an assessment process involving 73 authors from across the world which will inform the development of a range of products to actively share lessons.</p>	<p>Planning and coordination processes; monitoring and evaluation; national and subnational integration; Benefits and building support</p> <p><a href="http://ggbp.org/wp-content/uploads/2013/06/GGBP_June_-Factsheet.pdf">http://ggbp.org/wp-content/uploads/2013/06/GGBP_June_-Factsheet.pdf</a></p>
<b>Global Green Growth Institute</b>	<p>Research is one of three primary activities undertaken by GGGI, the others being technical assistance and capacity building ('country planning and implementation'), and fostering public private cooperation.</p> <p>The research programme is designed to support delivery of its TA programme. It fits into GGGI's theory of change by providing a convincing economic theory and policy agenda to explain the fundamentals of green growth and benefits of its pursuit.</p> <p><a href="http://gggi.org/activities/research/reports/">http://gggi.org/activities/research/reports/</a>  <a href="http://gggi.org/activities/research/research-initiatives/">http://gggi.org/activities/research/research-initiatives/</a></p>	<p>GGGI's research focuses on the economic aspects of green growth in which there is the greatest need for additional research and leading growth economists in developing and emerging countries. GGGI does not focus its efforts on purely or primarily environmental topics. Key topics include:</p> <ul style="list-style-type: none"> <li>• Green growth planning tools and methodology</li> <li>• Lessons from in-country green growth planning experience</li> <li>• Economic theory and policy of green growth</li> <li>• Resource-efficiency and green growth, including sectoral opportunities and approaches</li> <li>• Technological innovation and green growth</li> <li>• Employment and poverty reduction</li> <li>• Social innovation and welfare and political economy dimensions of green growth</li> <li>• International economic cooperation and green growth</li> </ul> <p>GGGI began by working in Brazil, Ethiopia and Indonesia. Work continued in these countries during 2011 and began in Kazakhstan, the United Arab Emirates, and Cambodia. In 2012, GGGI expanded into a number of other developing countries, including China, India, Jordan, Mongolia, Peru, Philippines, Rwanda, Thailand, and Vietnam.</p>
<b>Green Growth Knowledge Platform</b>	<p>GGKP identifies and encourages research on major knowledge gaps in green growth theory and practice. We emphasize a practical orientation for research and insist that the best policy can only emerge from close collaboration among scholars, practitioners, and policy makers</p> <p>GGKP identifies and encourages research on major knowledge gaps in green growth theory and practice. We emphasize a practical orientation for research and insist that the best policy can only emerge from close collaboration among scholars, practitioners, and policy makers</p>	<p>Research programmes developed under following headings:</p> <ul style="list-style-type: none"> <li>• Green Growth Metrics &amp; Indicators</li> <li>• Innovation and the Adaptation and Diffusion of Green Technologies</li> <li>• Green Growth, Trade, and Competitiveness</li> </ul> <p><a href="http://www.greengrowthknowledge.org/Pages/Research.aspx">http://www.greengrowthknowledge.org/Pages/Research.aspx</a></p>





Institution	Information on initiatives and research programmes	Primary research questions and objectives
<p><b>UNEP's green economy initiative</b></p>	<p>The green economy initiative works to:</p> <ol style="list-style-type: none"> <li>1. Promote the Green Economy Report and related research materials, which will analyse the macroeconomic, sustainability, and poverty reduction implications of green investment in a range of sectors from renewable energy to sustainable agriculture and providing guidance on policies that can catalyze increased investment in these sectors.</li> <li>2. Provide advisory services on ways to move towards a green economy in specific countries.</li> <li>3. Engage a wide range of research, non-governmental organisations, business and UN partners in implementing the Green Economy Initiative.</li> </ol> <p>It works in 14 countries across LAC, Africa and Asia, only three of which are low income economies, and has recently launched a regional piece of research focussed on the Caribbean.</p> <p><a href="http://www.unep.org/greeneconomy/ResearchProducts/tabid/4605/language/en-US/Default.aspx">http://www.unep.org/greeneconomy/ResearchProducts/tabid/4605/language/en-US/Default.aspx</a></p>	<p>Underpinning all dimensions of the Green Economy Initiative (GEI) is a focus on robust economic research and policy analysis. The research community of practice that it has convened has expertise in:</p> <ul style="list-style-type: none"> <li>• Analysing challenges and opportunities in specific green sectors, including agriculture, cities, fisheries, forests, green buildings, industry, renewable energy, tourism, transport, waste management and water;</li> <li>• Generating quantitative analysis and developing macroeconomic models that assess the impact of green investments; and</li> <li>• Identifying the enabling conditions and policy options for making a shift towards a green economy.</li> </ul> <p><a href="http://www.unep.org/greeneconomy/ResearchReports/tabid/4605/language/en-US/Default.aspx">http://www.unep.org/greeneconomy/ResearchReports/tabid/4605/language/en-US/Default.aspx</a></p> <p>Most GEI research efforts are currently focused on the development of GEI's flagship product, the Green Economy Report, and managing the development of The Economics of Ecosystems and Biodiversity series of reports. The Green Economy Report builds on two other research products the Global Green New Deal Policy Brief, and the Green Jobs Report.</p>
	<p>The OECD support research and policy development in green growth, stemming from its contributions to the Rio+20 conference and the commitments made by developing countries.</p> <p>OECD's longer term agenda is to support national and international efforts to achieve green growth. It aims to help countries foster economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies</p> <p>The OECD sees green growth as a practical and flexible approach for accelerating progress in the economic and environmental pillars of sustainable development, while taking full account of the social consequences of greening the growth dynamic of economies. The focus of green growth strategies is ensuring that natural assets can deliver their full economic potential on a sustainable basis. That potential includes the provision of critical life support services – clean air and water, and the resilient biodiversity needed to support food production and human health.</p>	<p>OECD has areas of work and research on:</p> <ul style="list-style-type: none"> <li>• Green growth country reports</li> <li>• Indicators and measurement tools</li> <li>• Green growth and development</li> <li>• Innovation and technology transfer</li> <li>• Environmental fiscal reform</li> <li>• Consumer behaviour change</li> <li>• Investment for green growth</li> <li>• Sectoral studies: water, agriculture, energy and food</li> </ul> <p><a href="http://www.oecd.org/greengrowth/">http://www.oecd.org/greengrowth/</a></p>