Unlocking business dynamism to promote green (sustainable and inclusive) growth: learning from innovation in emerging economies

Stefanie Bauer, Karen Ellis, Daniel Harris, Pragya Kothari, Alberto Lemma, Dominik Weidert, and Zhang Xiaoying

This material has been supported by UK Aid from the UK Government, however the views expressed do not necessarily reflect the UK Government's official policies.

Working Paper 361

Results of research presented in preliminary form for discussion and critical comment

Working Paper 361

Unlocking business dynamism to promote green (sustainable and inclusive) growth: learning from innovation in emerging economies

Stefanie Bauer (GIZ), Karen Ellis (ODI), Daniel Harris (ODI), Pragya Kothari (GIZ), Alberto Lemma (ODI), Dominik Weidert (independent expert), and Zhang Xiaoying (IPRCC).

January 2013

ODI
203 Blackfriars Road,
London
SE1 8NJ
www.odi.org.uk

ISBN 978-1-909464-03-2
Working Paper (Print) ISSN 1759 2909
ODI Working Papers (Online) ISSN 1759 2917

Contents

Contents iii
Acknowledgements iv
Tables and boxes v
Figures v
Acronyms vi
Executive summary x
1 Introduction 1
2 The central tenets of a green growth paradigm 3
2.1 What is green growth? 3
2.2 Why green growth? 3
3 Green growth in India 5
3.1 Growth, poverty reduction and environmental protection in India 5
3.2 The current policy environment 17
3.3 Proposed case studies for further analysis 32
4 Green growth in China 37
4.1 Growth, poverty reduction and environmental protection in China 37
4.2 The current policy environment 45
4.3 Proposed case studies for further analysis 61
5 Conclusion 64
References 66

Acknowledgements

The authors would like to thank John Young (ODI), and Dr Wang Xiaolin (IPRCC), for their thoughtful contributions to the framing of this research and comments on drafts of the paper. Although interviewees remain anonymous, we would also like to thank those who gave their time to be consulted during bilateral meetings and stakeholder workshops. We also want to thank Katherine Miles for her feedback and contribution to the final draft of the paper.

Tables and boxes

Table 1: Proposed case studies xii
Table 2: Key focus of India's five-year plans between 1951 and 2012 18
Table 3: Growth of installed wind capacity in India 26
Table 4: The Indian green building rating systems 30
Table 5: Main Strategic Emerging Industries (SEI) technologies 47
Table 6: Policies to support Strategic Emerging Industries (SEIs) in China 48
Table 7: Emissions trading in China, 11th and 12th five-year plans 53
Table 8: Ecological compensation mechanisms, 2008 54
Table 9: Selected green subsidies 57
Table 10: Phases of green public procurement and relevant legislation 59
Box 1: China's Top-1000 Energy-Consuming Enterprises Program 61
Table 11: Initial shortlist of recommended case studies for further analysis 62
Table 12: Proposed case studies 64

Figures

Figure 1: Population living on less than US$1.25 per day 7
Figure 2: The sectoral shift of India's economy since 1950 8
Figure 3: The environmental apparatus in India (authors' own graph) 13
Figure 4: National energy saving targets under the PAT scheme (2012-2015) 25
Figure 5: Selected countries' GDP growth rate, 1978-2011 37
Figure 6: Selected countries' GDP per capita growth rate, 1979-2011 38
Figure 7: Mapping a typology of Chinese policies for green and inclusive growth 61

Acronyms

BEE	Bureau of Energy Efficiency
BMO	Business Membership Organisation
BMZ	Federal Ministry for Economic Cooperation and Development
BR	Business Responsibility
BRICS	Brazil, Russia, India, China and South Africa
BSE	Bombay Stock Exchange
CBRC	China Banking Regulatory Commission
CCFG	Conversion of Cropland to Forests and Grassland Program
CCVI	Climate Change Vulnerability Index
CDKN	Climate Development Knowledge Network
CDM	Clean Development Mechanism
CEIA	Cumulative Environmental Impact Assessments
CG	Central Government
CGCF	China Green Carbon Foundation
CGI	China Greentech Initiative
CII	Confederation of Indian Industries
CII-ITC-CESD	Centre of Excellence for Sustainable Development of the Confederation of Indian Industry
CIRC	China Insurance Regulatory Commission
CPSE	Central Public Sector Enterprise
CSR	Corporate Social Responsibility
DIPP	Department of Industrial Protection and Promotion
DPS	Discharge Permit System
DSM	Demand Side Management
DST	Department of Science and Technology
EFR	Environmental Fiscal Reform
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
EPB	Environmental Protection Bureau
ESCO	Energy Service Companies
ESG	Environmental, Social and Governance
ET	Economic Times
ETS	Emissions Trading Schemes
EV	Electric vehicle
FC	Finance Commission
FCV	Fuel Cell Vehicles

FDI	Foreign Direct investment
FE	Financial Express
FECF	Forest Ecosystem Compensation Fund
FICCI	Federation of Indian Chambers of Commerce and Industry
FMC	Foundation for MSME Clusters
FT	Financial Times
FYP	Five-Year Plan
G-20	Group of Twenty
GIZ	Gesellschaft für Internationale Zusammenarbeit
GBI	Generation Based Incentives
GDP	Gross Domestic Product
GOI	Government of India
GRI	Global Reporting Initiative
GRIHA	Green Rating for Integrated Habitat Assessment
GW	Gigawatts
ICT	Information and Communication Technology
IDS	Institute of Development Studies
IEA	International Energy Agency
IEP	Integrated Energy Policy
IGBC	Indian Green Building Council
IGEN	Indo-German Energy Programme
IGEN-RE	Indo German Energy Programme - Renewable Energy Component
IICA	Indian Institute of Corporate Affairs
IISD	International Institute for Sustainable Development
ILO	International Labour Organization
IPCC	Intergovernmental Panel on Climate Change
IPRCC	International Poverty Reduction Center in China
ISO	International Organization for Standardization
IT	Information technology
LEED	Leadership in Energy and Environment Development
LGOP	State Council Leading Group Office on Poverty Reduction and Development
NDRC	National Development and Reform Commission
MCA	Ministry of Corporate Affairs
MDG	Millennium Development Goal
MEP	Ministry of Environmental Protection
MNRE	Ministry of New and Renewable Energy
MoCI	Ministry of Commerce and Industry
MoEF	Ministry of Environment and Forest
MOST	Ministry of Science and Technology

MRV	Measurement, reporting and verification
MSME	Micro, Medium and Small Scale Enterprises
MW	Megawatts
MWh	Megawatt hour
NAPCC	National Action Plan on Climate Change
NBS	National Bureau of Statistics
NDRC	National Development and Reform Commission
NEP	National Environment Policy
NEPA	National Environmental Protection Agency
NGO	Non-governmental Organisation
NInC	The National Innovation Council
NMP	National Manufacturing Policy
NVGs	National Voluntary Guidelines
ODI	Overseas Development Institute
OECD	Organisation for Economic Cooperation and Development
PAT	Perform Achieve and Trade Scheme
PBOC	People's Bank of China
PCI	Planning Commission of India
PHEV	Plug-in Hybrid Electric Vehicles
PLG	Provincial and Local Government
POP	Persistent organic pollutant
PRC	People's Republic of China
R&D	Research and Development
RBI	Reserve Bank of India
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical Substances
REC	Renewable Energy Certificates
RMB	Renminbi
RPO	Renewable Purchase Obligation
SAPCC	State Action Plan on Climate Change
SEBI	Securities Exchange Board of India
SEI	Strategic emerging industry
SEPA	State Environmental Protection Administration
SERC	State Electricity Regulatory Commission
SISCA	Selco Incubation Centre for South Asia
SME	Small and medium enterprises
SOE	State-owned enterprise
tce	tonnes coal equivalent
TERI	The Energy and Resource Institute

ToI	Times of India
TVE	Township and village enterprise
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nation Industrial Development Organisation
US	United States
VAT	Value-added tax
VC/PE	Venture Capital and Private Equity
WBCSD	World Business Council for Sustainable Development
WDI	World Development Indicators
WPI	Wholesale Price Inflation
WRI	World Resources Institute
WSJ	Wall Street Journal
WWF	World Wildlife Fund

Executive summary

Achieving sustainable and inclusive growth – or 'green growth' as it is defined in this working paper – is an urgent and challenging task. Creating new sources of income and employment that reduce poverty and are environmentally sustainable is the new global imperative. There is a great need for guidance and practical examples of successful policy interventions to help achieve this goal.

While no single country has yet achieved green growth, many emerging economies – including China, India and Brazil – are implementing or experimenting with innovative policy approaches and have succeeded in stimulating considerable amounts of associated investment and innovation by business as a result. So there is enormous scope to identify emerging lessons in real time, as policies are rolled out, to generate the policy and practical recommendations needed to promote green growth in other emerging and low-income countries.

ODI (Overseas Development Institute), GIZ (Gesellschaft für Internationale Zusammenarbeit) and IPRCC (International Poverty Reduction Center in China) have been developing a collaborative, research, policy engagement and knowledge exchange programme to promote more informed policy-making by identifying and disseminating lessons for governments, donors and the international policy community. The programme aims to provide robust evidence of effective ways to promote green growth by unleashing business investment and innovation, and it will assess the economic, social and environmental impacts of key selected policies and initiatives. The programme will not only undertake assessments of the impact of existing policies and initiatives but also facilitate lesson learning in real time, as new policies are implemented, by establishing a baseline and monitoring outcomes and impacts over time, so that policies can be adapted as necessary, providing lesson learning for other countries as early as possible.

An inception and scoping phase has been undertaken in China and India, in order to better understand the drivers for sustainable and inclusive growth and the related policy environment in each country, and to identify existing or new policies and initiatives that could provide valuable case studies. This working paper summarises the findings from the scoping phase, and sets out the case studies that are proposed as the focus for the ongoing research programme. We would welcome feedback on the selected case studies and proposed approach.

Progress towards green growth in China

In the more than 30 years since the beginning of its reform and opening-up period in 1978, China has achieved economic growth and transformation on an unprecedented scale, combining high rates of growth with rapid, if incomplete, industrialisation. This has brought about tremendous economic and social change in both rural and urban areas. These reforms have promoted economic development and reduced the size of poor rural populations, but have tended to promote forms of industrial development associated with environmental deterioration, thus dealing a huge blow to water, land and other natural resources. Except for the development of basic environmental protection legislation in this period, environmental protection and resource management have not kept up with economic progress sufficiently to bring about green growth.

Between 1992 and 2000, the Chinese economy industrialised and urbanised further, leading to increased productive capacity and incomes. Poverty continued to decrease, partly because of targeted interventions that improved well-being among the rural poor, though the benefits of growth were distributed unevenly across social and spatial groups. Environmental pollution and ecological damage intensified as demands on natural resources increased, though early efforts to control worsening environmental pollution did see some success, with emissions of some major pollutants decreasing in key areas. Since 2000, China has made more significant achievements in environmental protection.

After meeting most emission-reduction targets under the 11th Five-Year Plan in 2010, the State developed a 12th Five-Year Plan with three main objectives: transformation of the economic development model, scientific progress and social harmony. In order to meet these objectives, the government set energy-efficiency and emission-reduction goals, and evaluated the performance of local governments partly on their achievement of these metrics. The Ministry of Environmental Protection now appraises local government performance every year according to the stated emission-reduction goals and should publish the outcomes regularly.

In 2010, China issued its *National Development Priority Zones Plan* with the aim of identifying the major functions of different geographical areas in light of their carrying capacity of resources and environment, their current development intensity and their growth potential. Based on this assessment, the plan then aims to clarify a contextually appropriate development orientation for the area in question, thus improving development policies and controlling development intensity. With the introduction of a range of management measures like priority development zones, areas that are poverty stricken yet rich in resources cannot continue to rely on resource extraction for economic development. The question of how underdeveloped areas can avoid the pattern of 'treatment after pollution' growth strategies and develop low-carbon, green poverty-reduction programs has become one of the key challenges in today's efforts to alleviate poverty.

Given increasing recognition of the interaction between and interdependent nature of these three areas, part of the answer to this question can be seen in Chinese efforts to date. The country has shifted from a conceptualisation of development based simply on increasing farmers' income, to more comprehensive measures aimed at solving a range of economic, social and environmental issues. Since signing the Kyoto Protocol, China has introduced, refined and localised the Clean Development Mechanism (CDM), green credit, green securities, carbon sink and other advanced international policies, thus unleashing innovative ecological protection mechanisms and developing green, low-carbon poverty relief strategies in impoverished areas.

Progress towards green growth in India

While India has emerged as one of the fastest-growing economies in the world in the post-reform era, this has been accompanied by widening social inequality. India's economic growth has been unevenly distributed socially and spatially, with almost 30% of its population living on less than US$1.25 per day. A large share of the population still lacks basic access to affordable and quality services in health care, education, housing, energy, water and sanitation. Therefore, achieving more inclusive growth is an important political goal.

Indian policy-makers have recognized that economic development and natural-resource management are interdependent and that with economic growth, resource depletion will intensify. India has some of the most fragile ecosystems in the world; they are extremely vulnerable to the impacts of environmental changes, including climate change. As a country with most of its population living in rural areas, India is heavily dependent on natural capital and its sustainable utilisation for socioeconomic development and growth. Yet rapid industrialisation is responsible for a substantial rise in emission levels over the years, and India's dependence on fossil fuels for energy generation has contributed significantly to air pollution. Although regulatory measures have been introduced, to restrict environmental degradation from resource extraction, the impact of these measures has been minimal.

In sum, India is facing a multitude of challenges at the same time: it needs to grow, to address unemployment and poverty, and to handle the current economic and fiscal crisis as well as its environmental challenges. The growing population will continue to exert additional strain on non-renewable and agricultural resources, and the demand for food, water and energy will put pressure on scarce natural resources (UNCTAD, 2012), further pushing prices upward. The effects of rising food prices are already apparent; poor households are feeling the strain. Against this background, bringing India onto a sustainable and inclusive growth path is vital.

While the Indian government takes a leading role in setting the development path, the private sector has become a key actor in recent years; this is due to its growing share in the economy, influencing the development agenda of the country. Some of India's large businesses are helping to drive the green growth agenda of the country and employ sustainability practices beyond compliance. Businesses like ITC, TATA and Mahindra are increasingly acknowledging the business case and are beginning to integrate sustainability into their business models and management practices. Growing environmental concerns and adoption of international best practices have led to an improved environmental governance apparatus in the country.

Integration into the world economy has obliged export-oriented private-sector companies to comply with international environmental and social standards and adopt more sustainable business practices. The establishment of subsidiaries by Indian companies in countries relatively more advanced in implementing environmental and social standards exposes the companies to better environmental and social governance practices.

Taking India to a green or sustainable and inclusive growth path requires integrated and coordinated action across different ministries and other key stakeholders, such as the private sector. Unlike other countries in Asia such as Vietnam, which is currently developing a green growth strategy as a basis for restructuring its economy and growth model, India lacks a coherent and comprehensive policy framework, and efforts are often uncoordinated or taking place in political silos. However, different framework policies exist, providing an orientation for sustainable and inclusive growth in India.

India's 12th Five-Year Plan, titled 'Faster, Sustainable and More Inclusive Growth', explicitly emphasises sustainable growth for the first time, reflecting a shift in the development priorities of the country. The Indian economy has been steered by five-year plans (FYP), which are developed, executed and monitored by the national Planning Commission, since 1951. While poverty reduction and growth have been on the agenda for a long time, environmental concerns and social inclusion featured as a priority only in the current plan. Compared to China, where the focus has moved away from the rate of growth towards the quality of growth, India's FYP is still focused on realising a high rate of growth (9% or above).

Proposed case studies for analysis

As the paper shows, many policies and initiatives are in existence or are being introduced in both China and India that could potentially contribute towards achieving more sustainable and inclusive growth. During the inception phase, a number of specific policies and initiatives have been identified as areas for potential lesson learning, either by looking back on the experience of policy implementation and impact to date, or by monitoring the impact of newly introduced policies over time.

In some cases, the two countries are tackling similar problems in different ways, thus offering scope for direct comparison of the pros and cons of different approaches. Some of the case studies will facilitate this direct comparison, while others will generate lessons about broader approaches, such as the use of industrial development policies to promote particular new green sectors, or the use of voluntary approaches or industry-led initiatives to encourage greener business behaviour. The proposed case studies are listed in Table 1.

Table 1: Proposed case studies

China	India
Top 10,000 Programme Scheme to promote energy efficiency in key industries	Perform-Achieve-Trade Scheme Energy-efficiency trading scheme to reduce energy consumption across key industries
Pilot Emissions Trading Schemes in five cities	Green Buildings
Measures to promote renewable energy,	Measures to promote renewable energy,

e.g. wind or solar	e.g. wind or solar
Forest-related compensation mechanisms	National Rural Employment Guarantee Act (NREGA) Employment scheme focused on environmental preservation
Ecological model country	The E-waste rules Rules to encourage the proper recycling of electronic waste and attributing responsibility to the producers
Measures to promote new energy vehicles One of the strategic emerging industries identified in China's 12th Five-Year Plan	Innovation Cluster Initiative Promoting technological upgrading and better operational practices to improve energy efficiency in the foundry sector
Top 100 Green Companies Private sector-led index showcasing greenest companies in China	Star rating and labelling programme Energy-efficiency rating scheme for electrical appliances and buildings
Carbon Trust certification scheme Monitoring carbon emissions	Bombay Stock Exchange – GREENEX Benchmarking of the carbon footprint of listed companies
China Greentech Initiative Private sector-led market planning to promote business and sustainability goals	Private sector-led green initiatives, e.g. the Indian conglomerate ITC's Social and Farm Forestry Programme
	Environmental Fiscal Reforms

Conclusion

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 themselves and in other countries.

The research will particularly focus on understanding the intersection between government and business in terms of their respective contributions to achieving sustainable and inclusive growth. As 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.

We would welcome feedback on the selected case studies and proposed approach.

1 Introduction

Achieving sustainable and inclusive growth – or 'green growth' as it is defined in this working paper – is an urgent and challenging task. Creating new sources of income and employment that reduce poverty and are environmentally sustainable is the new global imperative. There is a great need for guidance and practical examples of successful policy interventions to help achieve this goal.

While no single country has yet achieved green growth, many emerging economies – including China, India, and Brazil – are implementing or experimenting with innovative policy approaches and have succeeded in stimulating considerable amounts of associated investment and innovation by business as a result. So there is enormous scope to identify emerging lessons in real time, as policies are rolled out, to generate the policy and practical recommendations needed to promote green growth in other emerging and low-income countries.

ODI (Overseas Development Institute), GIZ (Gesellschaft für Internationale Zusammenarbeit) and IPRCC (International Poverty Reduction Center in China) are collaborating to have been developing a collaborative, research, policy engagement and knowledge exchange programme to promote more informed policy-making by identifying and disseminating lessons for governments, donors and the international policy community. The programme aims to provide robust evidence of effective ways to promote green growth by unleashing business investment and innovation, and it will assess the economic, social and environmental impacts of key selected policies and initiatives.

It will examine five overarching questions:

- 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?

The programme will not only undertake assessments of the impact of existing policies and initiatives but also facilitate lesson learning in real time, as new policies are implemented, by establishing a baseline and monitoring outcomes and impacts over time, so that policies can be adapted as necessary, providing lesson learning for other countries as early as possible.

An inception and scoping phase has been undertaken in China and India, in order to better understand the drivers for sustainable and inclusive growth and the related policy environment in each country, and to identify existing or new policies and initiatives that could provide valuable case studies. It involved:

- a review of the evolution of relevant policies in China and India over recent decades, and the main drivers and constraints to reform;

- review and categorisation of existing policies and private sector initiatives that could potentially contribute to the achievement of more sustainable and inclusive forms of growth;

- consultation with a range of experts and stakeholders in both the public and private sectors;

- workshops in both countries to identify and discuss key the most interesting case studies for analysis.

This working paper summarises the findings from the scoping phase and sets out the case studies that are proposed as the focus for the ongoing research programme. The case studies have been selected on the basis of the following criteria:

- The policies or initiatives identified have the potential to deliver, or indeed may already demonstrate, 'triple wins' in the form of economic, environmental and social improvements. (Although the achievement of triple wins does not need to be the *stated* goal of the policy or initiative in question – indeed the review of policies shows that is a rare occurrence.)
- The policies or initiatives identified are likely to generate useful lessons either in terms of the policy process itself and / or the implementation mechanisms.
- The proposed case studies are also likely to be relevant to other countries, particularly other emerging economies, in order to maximise the potential for wider lesson learning and knowledge exchange.
- Finally, we selected case studies which provided an interesting angle on the role of the private sector in achieving these triple wins.

It is envisaged that in undertaking the case studies, the methodology would involve:

- Reviewing the policies that have been used to incentivise innovation / investment / new business models (as appropriate) in that sector

- Reviewing the response from the private sector to those policies e.g. investment that has occurred, energy efficiency measures adopted etc.

- Consulting with business about the incentives and constraints they face in responding to those objectives or developing that industry, and the extent of the opportunity they think exists if conditions were right.

- Reviewing the evidence base on the impact of that business response / investment, in terms of economic, social and environmental outcomes.

- Then if we have enough information from existing evidence, we would be able to identify lessons learned and implications for policy, but if not (or if it is a very new policy or initiative being assessed), then we would develop a plan for monitoring and evaluation that would facilitate the identification of lessons over time.

We would welcome feedback on the selected case studies and proposed approach.

The working paper is structured as follows: In the first section, we briefly set out the central tenets of a green growth paradigm. In section two we present the findings from the scoping phase in India, looking first at the evolution of thinking on green/sustainable and inclusive growth in India and associated drivers and challenges, and then at the current policy environment, before setting out the specific policies and initiatives that are proposed as case studies for further analysis and impact assessment. In section three, we present the findings from the scoping phase in China in a similar format. In section four, we conclude by discussing the potential for cross-learning between China and India, and for lesson learning in other countries.

2 The central tenets of a green growth paradigm

2.1 What is green growth?

Green growth[1] emphasises the necessity and opportunity of an economic trajectory that 'improves human well-being and social equity while simultaneously reducing environmental risks and ecological scarcities' (UNEP). The concept of green growth identifies opportunities for economic growth by utilising mutually reinforcing positive effects between economic, social and environmental sustainability – the triple win – as well as by engaging in fast-growing green sectors, such as renewable energies and resource-efficient technologies. Moreover, green growth calls for a structural change, a move away from a resource- and emission-intensive business-as-usual model to a model of long-term environmental, social and economic benefits. While governments need to establish an enabling framework for green growth, the business sector must contribute long-term investments and unleash innovation for structural transformation.

2.2 Why green growth?

Though faster and sustained economic growth and development is the main objective for most emerging and developing countries, 'the last few decades have made it clearly evident that economic development can no longer be viewed in isolation from environmental protection and social progress' (MoEF, 2011:9). Fast economic expansion and population growth in emerging and developing countries revealed the limited environmental carrying capacity and the social burden of a 'grow first, clean up later' growth pattern, as well as the dangers of not taking into account environmental scarcities and social imbalances. Global crises (financial, food, water, energy and climate) have also highlighted the need to look for a new growth paradigm. Spiralling scarcity and prices of resources make securing access and affordability a priority for governments and businesses alike. It becomes clear that current 'business as usual' practices will ultimately deteriorate the foundations of future development and prosperity under existing resource constraints. In some emerging countries, such as India, the disparity of income widened during economic expansion and left many people in poverty, threatening social stability and peace.

At these crossroads there is a pressing need to redefine economic growth to include and benefit from environmental sustainability and social inclusion. The transition to such a 'green and inclusive' economy requires structural changes, which can only succeed if governments as well as the private sector contribute significantly. While this requires a paradigm shift in the way that governments, the private sector and consumers think about the utilisation of resources, there is a need for new policy frameworks, support mechanisms and appropriate institutions that incentivise and support the business sector to substantially contribute to the transition. The creation of new market mechanisms that put a price on natural capital might be an answer, but strong leadership from governments is required (WAVES, undated).

While the green growth model requires certain specific policies and institutions to be in place, it is also an opportunity to achieve (1) higher competitiveness; (2) new sources of income and jobs; (3) low-carbon emissions, reduced environmental degradation and resource exploitation; and (4) contributions to broader societal goals of sustainable development, including social inclusion. Accordingly, identifying innovative policy instruments and support mechanisms that

[1] While globally 'green growth' is the dominating terminology to describe the discourse around economic, environmental and social aspects of sustainable growth, in India 'sustainable and inclusive growth' is used. Green growth and sustainable and inclusive growth are hence used interchangeably in this paper.

create incentives for businesses to adapt a green growth business model promises to improve a country's long-term economic, social and environmental development.

A majority of emerging and developing countries are faced with similar challenges**:** fostering economic growth, alleviating poverty and improving social inclusion, achieving a sustainable use of natural resources, and obtaining a reliable as well as affordable energy supply. While developing countries around the world raise concerns that the green growth paradigm might slow down their growth and lead to job losses, the examples of Germany and South Korea suggest that much of the cost-benefit debate might be misguided. The estimated US$43 billion invested as part of South Korea's 'Green New Deal' is expected to have created 960,000 jobs between 2009 and 2012, including jobs in an environmentally friendly transportation network, water management and river rehabilitation, clean energy, green information technologies and waste-to-energy (UNEP, 2012). According to the German government, employment in the renewable energy sector alone increased by 129% between 2004 and 2010, amounting to 367,400 jobs (BMU, 2011). Beyond these examples, the reality of assumptions of traditional growth models in a resource-constrained, competitive global economy is very questionable. More research on policy impacts is therefore needed to provide inputs for evidence-based policy-making and to inform the 'green growth policy agenda'.

3 Green growth in India

India's 12th Five-Year Plan sketches the country's national priorities of reaching 'Faster, Sustainable and More Inclusive Growth', outlining a strategy of addressing some of the country's biggest challenges, above all the economic slowdown, social imbalances and poverty, as well as energy security and natural resource management (GOI, 2011a). While the economic slowdown is partly related to the global economic and financial crisis, India has not yet succeeded in effectively decoupling its economic growth from resource use and emissions, to alleviate poverty and to achieve a spatially as well as socially equitable development. Today, India has a population of 1.2 billion, of which 30% (300 million people) live below the poverty line[2] (GOI, 2012). Currently, 70% of India's population rely on natural resources for sustenance (UNDP, 2011), underlining the importance of preserving natural resources for growth, welfare and social security. It is against this background that the Indian dilemma of reaching 'triple bottom line'[3] objectives becomes visible and the need for questioning existing growth patterns becomes evident. The following sections sketch the challenges and drivers of change to frame the discussion on green growth policies in India.

3.1 Growth, poverty reduction and environmental protection in India

The complexity of sustainable development and the linkages between economic development, social inclusion and environmental protection is a recent development on the national policy agenda, even though environmental concerns have been part of the national debate since the 1970s and promotion of 'Inclusive Growth' has dominated the political debate in recent years. This section outlines the development of the discourses and political priorities with regard to economic development and growth, environmental conservation and social inclusion in India over the last three decades, tracing the evolution of the 'Sustainable and Inclusive Growth' discourse as it is present in India today.

Economic growth

While India has experienced Gross Domestic Product (GDP) growth rates of 8.5% in the past eight years, 2012 marks the beginning of an economic downturn, with the growth rate dropping to 5.3%, high inflation rates and a balance-of-payments deficit. The major factor behind the economic slowdown is a poor performance of the manufacturing and agricultural sector, while currency depreciation is inflating the import bill. India's exports declined 4% in May 2012 from US$26.79 billion to US$25.68 billion year-on-year, reflecting a slowdown in production and manufacturing (Gupta and Jain, 2012). The service sector lost momentum, with growth falling from 7.9% to 6.9%; the deceleration was even steeper in trade services, implying that consumption is slowing down materially (ET, 2012). These data pose a dilemma for policy-makers as the room to stimulate growth with fiscal expansion is constrained by high inflation and high fiscal deficit (FICCI, 2012), raising doubts about the country's capability to achieve its growth objectives.

Nonetheless, impressive economic progress has been achieved since the beginning of India's economic liberalisation in 1991. At that time, central economic planning and the increase of world oil prices had led to the Indian economic crisis of 1990-1991 with a fiscal deficit amounting to 8.4% of GDP (Gupta, 2012). This shock evolved into a 'tipping point' in India's economic history, starting a reversal of government intervention and regulation. India undertook a systemic shift to a more open, market-based economy, allotting a greater role to the private sector, redefining the role of the government, emphasising export orientation and foreign direct investment as major pillars of its growth model, and creating a more investment-friendly environment for businesses (Ahluwalia, 2002). Since then the Indian

[2] The poverty line is 28.65 Rupees per day as per Government of India, Planning Commission definition

[3] The term 'triple bottom line' was first introduced in 1994 by John Elkington, who emphasised that the (economic) bottom line needs to be extended by environmental and social dimensions. Accordingly, the 'triple bottom line' approach refers to the economic, environmental and social value added generated by a company.

economy has witnessed a transformational change, becoming one of the fastest-growing economies in the world and the third largest economy after the US and China in purchasing-power parity with a GDP of US$4.46 trillion in 2011 (WB, 2012).

Since the post-reform era, the private sector in India has assumed an important role in economic development, now contributing almost 75% of GDP (CRISIL, 2012). Over the years the trend in private-sector investment has rapidly evolved, moving from investments in transport, social services and the financial sector to manufacturing, infrastructure, agricultural products, and information technology and telecommunication (Assocham, 2012). For some sectors the growth expectations are enormous. For instance, the pharmaceutical industry, which was practically non-existent prior to the reform era, grew at 15.7% in 2011 and is expected to value at US$74 billion in sales by 2020, up from the current US$11 billion (CCI, 2012). The retail sector witnessed growth that placed it fifth globally, contributing to over 20% of India's GDP in 2009 (Gupta et al, 2010). At the same time, public-sector GDP growth remained stagnant at 6% in the two decades since 1990, whereas private-sector GDP growth went up to 7.7% in the 2000s from 5.7% in the previous decade, with a record rate of 9.7% in 2007-2008 (CRISIL, 2012).

With economic liberalisation, increased foreign direct investment (FDI) came into the country. According to UNCTAD's World Investment Prospects Survey 2010-2012, India has become the second-most lucrative destination for FDI in the world and ranks sixth as an investor, carrying out large-scale investments in other countries (UNCTAD, 2010). However, the recent economic slowdown and the resulting decrease in investor confidence have led to a 41% decline of FDI, from US$3.12 billion in 2011 to US$1.85 billion in 2012 (ET, 2012). The causes of this sharp deceleration could be multiple, including the slump in the global economy and trade, tighter monetary policy, and higher nominal interest rates, which are crucial to combat high inflation. The unexpected large budget deficit in 2011 and a growing sense of what is commonly referred to as 'a national policy paralysis' due to political parties' inability to agree on important economic reforms further fed uncertainty among investors.

As a first response to the increasing pressure, the Indian government announced key economic reforms in September 2012, hoping to regain investor confidence, including the opening up of the multi-brand retail sector and the aviation industry to FDI (ET, 2012). Pressure is mounting on the government to curtail inefficient spending and to cut subsidies in order to keep the current balance-of-payments problems under control and to manage the fiscal crisis. As a first step, the government announced its decision to cut fuel subsidies in September, triggering a 12% increase in diesel retail prices and restrictions on the sale of cooking gas (ToI, 2012). It is estimated that subsidising retail prices of diesel, kerosene, liquefied petroleum gas (LPG) and, to a lesser extent, gasoline in the fiscal year 2010-2011 amounted to $9.6 billion (TERI, 2012b). With the elections due in 2014, and considerable political and social furore subsequent to the announcements, Prime Minister Manmohan Singh's government faces the challenge to introduce a mix of policies that cope with unwanted regressive side effects of the phase out of subsidies while further stimulating private-sector investments, innovation and industrialisation and improve the economy's competitiveness.

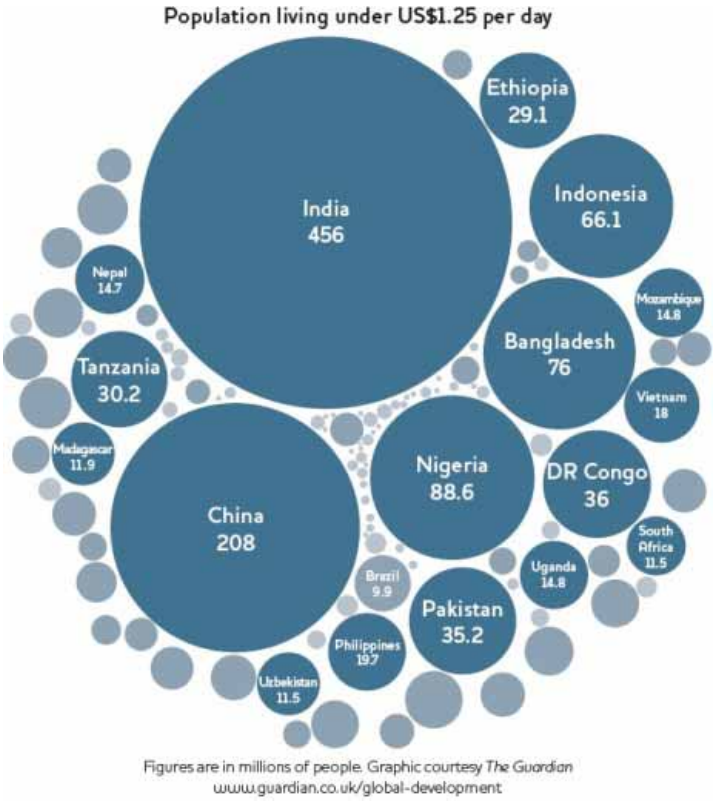
While the reforms might indicate the end of the policy paralysis and boost investor confidence, they may still be repealed because of concerns raised by the general public and the opposition. These concerns relate to the fear that social disparities might increase as a consequence of reforms, challenging the social inclusion agenda. The policy dilemma around conflicting policy objectives becomes visible with the recent development of the Trinamool Congress Party pulling out of the coalition government. If other parties do not back the Congress, the Congress will be in the minority. Meanwhile, the opposition – the Bharatiya Janata Party, the Communist Party and various regional parties – vowed to block the change. Until these economic reforms are undertaken, domestic and foreign investors will remain uncertain about India's economic future. The prospects for innovation and investment by the private sector,

including the country's 26.1 million[4] micro, small and medium enterprises (MSMEs), will remain low.

Social Inclusion

While India has emerged as one of the fastest-growing economies in the world in the post-reform era, the growth story is also of widening social inequality. India's economic growth has been unevenly distributed socially and spatially, with almost 30% of its population living on less than US$1.25 per day (WB, 2011). A large share of the population still lacks basic access to affordable and quality services in health care, education, housing, energy, water and sanitation. This underlines the rising importance of economic governance towards inclusive growth and a stronger role in rural areas for MSMEs, which employ an estimated 59.7 million persons[5] in the country already.

Figure 1: Population living on less than US$1.25 per day

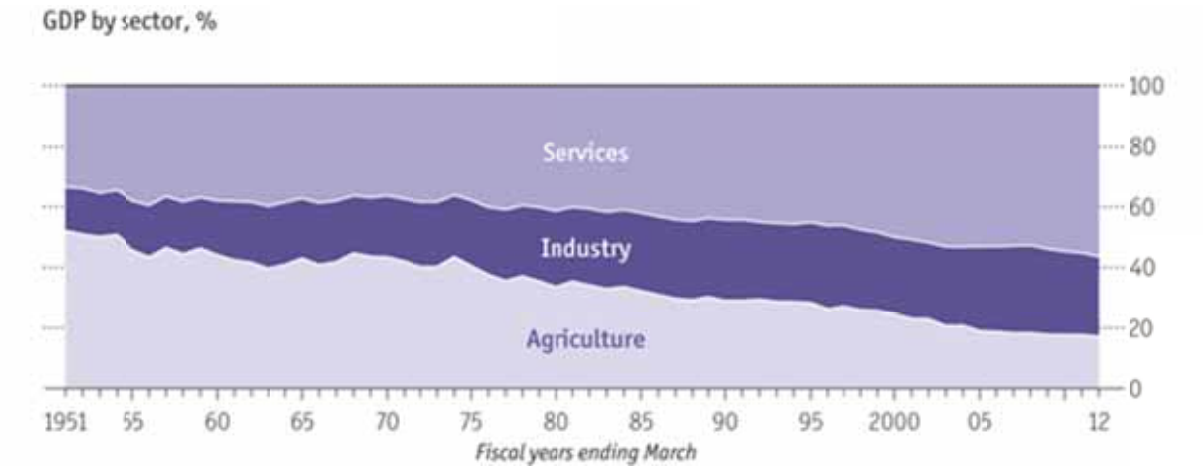


Source: The Guardian, 2010.

Reasons for the uneven distribution of income in India are the country's specific economic structure and a growth pattern that has led to a rapid rise in labour productivity rather than an expansion in employment (ILO, 2012). While India's exports were dominated by labour-intensive sectors such as textiles and agriculture in 1995, the share of the service sector increased from 30% of GDP in 1950 to almost 60% today, rising at an accelerating pace as the period progressed. Manufacturing represents just 15% of the economy, much the same as in the 1960s (see Figure 2), employing only 9% of the population (GOI 2011b). Unlike China, India is missing the opportunity of a thriving industrial and manufacturing sector that can drive exports and absorb the abundant labour force that is leaving the agricultural sector, which itself needs to become more efficient.

[4] Ministry of Micro, Medium and Small Scale Enterprises
[5] Ministry of Micro, Medium and Small Scale Enterprises

Figure 2: The sectoral shift of India's economy since 1950



Source: Economist, 2012.

Furthermore, the share of exports of agricultural and textile exports almost halved while exports of refined petroleum oils rose from 1.3% in 1995 to 16% in 2010 (see Figure 3) (MIT, 2009). Unfortunately, the extraction of natural resources is very capital-intensive and does provide jobs for just a few. Meanwhile, the share of people employed in the agricultural sector dropped only slightly from 62.3% in 1993-1994 to 56.1% in 2004-2005 (CRISIL, 2010).

While it is difficult to attribute this completely to the lack of opportunities to absorb the unskilled or low-skilled labourers in other avenues of economic activity, this persistent underperformance of the labour-intensive agricultural sector is contributing to the rising urban-rural divide. Most of the poor, primarily landless workers, live in rural areas and rely on farm work for their livelihood. While India's unemployment rate stands at 9.8% (Economist, 2012), the challenge remains to create not just more but decent employment, with incomes that reduce poverty. Many Indians are self-employed by necessity, not by choice. In order to absorb this significant part of the labour force and to counterbalance the detrimental impact of the current global economic crisis on employment, the need to introduce measures to create new domestic employment opportunities gains importance. For that reason, the Indian government now places importance on boosting manufacturing (GOI 2011b).

As India's large younger generation reaches working age, India stands a chance to realise its demographic dividend and achieve higher levels of economic growth. If working-age people can be employed productively, India's economic growth stands to accelerate significantly. Demand-side (industrial promotion) and supply-side (skill development and higher education) measures are hence necessary to turn this latent human resource into economic output. However, both measures require more investment by the private sector and government. If the current economic slowdown continues, the distribution of income might become even more unbalanced, with serious implications for a rising young population without decent jobs[6]. The violent conflict between management and workers in a Maruti Suzuki plant in Manesar, Haryana, in July 2012 led to the death of the human resource general manager and injuries to 96 employees. This example reflects a growing unrest and dissatisfaction among workers and labour unions and calls for inclusive economic development strategies and decent employment. Subsidised programs by budget-restricted governments may provide temporary job opportunities, but promoting private sector development and innovation, deepening and broadening of value chains as well as strengthening compliance to social and labour standards offer opportunities for sustainable job creation.

[6] ILO – Decent work goes beyond the mere creation of jobs to an understanding that work is a source of personal dignity, family stability, peace in the community, democracies that deliver for people, and economic growth that expands opportunities for productive jobs and enterprise development.

While different stakeholders debate whether India should focus on economic development of urban or rural areas to sustain growth, worsening economic conditions and social challenges are calling for the integrated development of both. 'India has chronically underinvested in cities, resulting in gridlock, slums, poor provision of public services and sustained under par urban economic growth' (MGI, 2010). India's urban population grew from 290 million in 2001 to 340 million in 2008 (MGI, 2010), and the country also saw an increase in the number of slums, with 17% of global slum dwellers residing in India (UN Habitat Report, 2006). The increasing number of slum dwellings from 27.9 million in 1981 to over 40 million in 2001 (WaterAid, undated) reflects both the limited capacity of local governments to accommodate swelling urban populations and the constrained absorption potential of the private sector. Fostering labour-intensive economic activities and reducing the informal economy could help to raise average incomes and reduce slum dwellings while improving the lives of urban poor.

While a shift towards a green growth paradigm might offer job creation in certain labour-intensive sectors such as construction and renewable energies, the extent of long-term job creation heavily depends on the level of private -sector engagement. Certainly, the effect of green growth policies on job markets is debatable and heavily depends on a country's resource endowment, institutions and industrial structure, as well as the specific policy design. However, the real strength of green jobs lies in the realisation of synergetic investments that have both positive environmental and labour market effects. Given the importance of environmental concerns, along with the relative labour intensity in at least some green investment, activities that promote the development of green sectors as well as skill development, vocational education and training are required (WB, 2012).

Environmental Protection

Indian policy-makers have recognised that economic development and natural-resource management are interdependent and that with economic growth, pressure on resource depletion will intensify (GOI, 2011). While all natural resources such as forests, soils, water and fisheries are increasingly put under stress, insufficient fresh water may become the most severe challenge over the next decade. Agriculture, industry, households and energy generation, among others, compete for and are dependent on this scarce resource. The over-exploitation of ground water is already critical in Delhi, Punjab, Haryana and Rajasthan (Kapoor, 2012). Water shortages have already been experienced in these states. The summer of 2012 saw wide protests in the National Capital Region over acute water-supply shortages followed by protests against power cuts that continued despite a hike in electricity tariffs (India Today, 2012). A study by the World Resource Institute (WRI) found that India faces most concern for water constraints, which also has direct bearing on the potential for energy generation. Concerns arising from water scarcity/water constraints are a pressing issue due to the direct bearing it has on energy generation. This concern is hardly a contentious issue with 73% of the capacity (62% of existing and 79% of new capacity) of the three largest power generation companies — NTPC, Tata Power, and Reliance Infrastructure (including Reliance Power) — located in water-scarce or stressed areas (WRI, 2010). With an expected increase in the demand for water, careful planning is needed for replenishment, recycling and a responsible utilisation of ground water. Environmental degradation – due to rising emissions by industries and individuals, and continuous exploitation of natural resources – is already deteriorating the livelihoods of the rural population and threatening the health of the urban population especially (UN). Economic expansion has led to land degradation and deteriorated food security, a freshwater shortage that exacerbates water stress, and steadily increasing emissions. The consequent loss of biodiversity, melting of glaciers, extreme weather events and flooding of low-lying areas threaten to cause severe social and economic disruptions (Sathaye et al, 2006).

India has some of the most fragile ecosystems in the world; they are extremely vulnerable to the impacts of environmental changes, including climate change. With only 2.4% of the world's land area, India accounts for 7-8% of the earth's plant and animal species. It is one of 17 mega diverse countries in the world, with ten different biogeographic zones, three global biodiversity hotspots and a high degree of endemism (Mittermeier et al, 1997). India ranks 28th of 193 countries rated as being exposed to 'extreme risk' by Maplecroft's Climate Change

Vulnerability Index (CCVI), which assesses the vulnerability of countries to adverse effects of climate change and compares it to adaptive capacities. Several Indian cities are rated 'extreme risk' or 'high risk', including Calcutta, Mumbai, Delhi and Chennai. The impacts could have far-reaching consequences, not only for local populations but also for business, the national economy, and the balance sheets of investors, particularly as the economic importance of these urban centres is set to increase dramatically (Maplecroft, 2012). While the Indian government has taken various measures to counter environmental degradation and to promote protection, their success is debated. For instance, the government has set up state and central pollution control boards, imposing fines and promoting cleaner technologies for prevention and abatement of industrial pollution. Despite these regulatory and legislative measures, reports of contaminated ground water and chemical-laden industrial waste being discharged into water bodies continue to make headlines.

As a country with most of its population living in rural areas, India is heavily dependent on natural capital and its sustainable utilisation for socioeconomic development and growth. According to studies by The Economics of Ecosystems and Biodiversity (TEEB), almost half of the GDP generated by India's poor is provided by ecosystems (TEEB for Local and Regional Policy Makers, 2010). Moreover, ecosystems and biodiversity are providing essential inputs to businesses and economies as a whole. Since the market for the valuation of natural resources and ecosystem services is non-existent, these resources are invariably over-exploited and degraded, treated as public goods, and subject to the 'tragedy of commons'. The development of a framework for the pricing of natural capital might be a solution. However, this also requires more research on how externalities and natural assets must be priced, and in turn how to report on the way companies use natural assets such as water and biodiversity.

While rapid industrialisation is responsible for the substantial rise in emission levels over the years, India's dependence on fossil fuels for energy generation has contributed significantly to air pollution, with 65% of the country's total power generation coming from non-renewable sources (Kapoor, 2012b). Furthermore, subsidies on various non-renewable resources promote their excessive use. With ongoing economic expansion, a constantly increasing population and millions without access to energy, finding alternative energy sources to secure supply is crucial. The expansion of renewable energy sources as well as an increase in energy efficiency is key to addressing energy scarcity, as well as addressing climate change by moving the economy onto a lower carbon path. Moreover, there is a strong need to effectively incentivise the private sector to acquire, adapt and further develop renewable energy and energy-efficiency technologies.

Despite regulatory measures to reduce environmental degradation from resource extraction, the impact of these measures has been minimal. Environmental degradation, especially by extractive industries, not only has impacts on the environment but also has implications for biodiversity and the communities located there. Greenpeace India is widely campaigning against the mining sector because of its impact on biodiversity. Specifically, the campaigners have concerns about the threat of coal mining to tiger habitats and the fragmentation of tiger reserves (Greenpeace, 2012). Furthermore, mining activities led to the displacement of at least 2.55 million people in India between 1950 and 1990 (IGNOU 2001 as taken from Downing, 2002). By contaminating land and soil, mining causes losses in productivity of rural areas and leads to water scarcity by lowering the water table, which also directly affects the socioeconomic conditions of the affected communities. Efforts to contain environment degradation are rendered ineffective due to corruption, illegal development activities and misuse of the law (Planning Commission, 2012). An Indian multinational company engaged in mining was charged with environmental damage and complicity in human rights violations in the form of abuse and forced eviction of tribal communities in its bauxite mine in Niyamgiri, Orissa. (Amnesty, 2010)

In sum, India is facing a multitude of challenges at the same time: It needs to grow, to address unemployment and poverty, and to handle the current economic and fiscal crisis as well as its environmental challenges. The growing population will continue to exert additional strain on non-renewable and agricultural resources, and in turn, the demand for food, water and energy will put pressure on scarce natural resources (UNCTAD, 2012), further pushing

prices upward. The effects of rising food prices are already apparent; poor households are feeling the strain. Against this background, moving India onto a more sustainable and inclusive growth path is vital.

Understanding the Drivers of Change in India

Both the Government and the private sector increasingly recognise the importance of aligning economic, social and environmental objectives. While it is still the Ministry of Environment and Forests (MoEF) that drives India's sustainability discourse, especially internationally, other ministries increasingly recognise their role in the sustainable and inclusive growth agenda. This section elucidates what stakeholders are shaping this agenda. It sketches how powers are allocated, exploring the dynamics that lead to prioritising development goals (economic growth, social inclusion, environmental protection) while relatively neglecting others. The authors acknowledge that the factors cited are limited. However, our aim is to focus on the drivers for change that are relevant for understanding the context of the case studies set out in chapter 5.

Policy Drivers

The complexity of the Indian political system poses challenges for policy coherence and coordination of policies that promote sustainable and inclusive growth. Politics in India follow the framework of a federal Westminster-style parliamentary democratic constitutional republic (Kothari, 2012). Federal and state elections take place in a multiparty system, making India the largest democracy in terms of citizenry. The central government exercises broad administrative powers; however, the power of policy implementation is increasingly shifting to the state governments, who have their own elected governments. This setting makes the implementation of national-level policies, including many of the guiding policy frameworks related to sustainable and inclusive growth, difficult due to the lack of capacity of urban local bodies, different political ideologies, lack of will, and difference in priorities of states.

While MoEF is leading international discussions and is responsible for conducting environmental impact assessments and granting environmental clearances to businesses, other governmental actors have also started to introduce innovative policy instruments to incentivise the private sector to adopt more sustainable practices. Figure 4 highlights some milestones that illustrate the shift towards a broader and a more integrated understanding by the government of the role of business in the sustainability agenda and sketches the complexity of the policy apparatus.

Environmental Impact Assessments have been an important instrument since the 1990s. However, some government actors aim to promote a more holistic understanding of businesses' environmental, social and economic responsibilities. Nevertheless, policy coherence on 'sustainable and inclusive growth' is lacking: Different governmental actors pursue disparate policy objectives on national, state, district and municipal levels, and sometimes efforts conflict with each other. Different ministries and agencies fulfil their own institutional logic and self-interest and often apply short-term strategies, making it difficult for a common agenda to evolve. These dynamics are especially important when trying to develop and implement extensive and overarching reforms.

A lack of policy coherence and coordination leads to uncertainty and confusion among private-sector players. While there are efforts by different government actors such as MoEF, the Ministry of Corporate Affairs (MCA) and regulators such as the Securities Exchange Board of India (SEBI), the capital market regulator, to bring the sustainability agenda forward, a lack of coherence and contradictory messages between and within ministries lead to irritation among businesses and investors. For example, the draft Companies Bill (2011) mandates businesses to spend 2% of three years' average profit in Corporate Social Responsibility (CSR) activities, which it conceptualises as community investment and philanthropic contributions. This stands

in sharp contrast to the National Voluntary Guidelines on the Environmental, Social and Economic Responsibilities of Businesses, released by MCA in 2011, which promotes the holistic conceptualisation of CSR in terms of the integration of environmental, social and governance aspects in businesses' core operations and practices. Private sector, investors and civil society alike hence lack trust in the seriousness of the agenda.

Figure 3: The environmental apparatus in India (authors' own graph)

Domestic Drivers

The domestic factors driving Indian actors towards increased political commitment to a more sustainable and inclusive growth agenda include, above all, energy security and social stability.

Against the background of the country's growth objectives, constrained domestic energy prices and high world energy prices, India's energy needs pose a challenge for future energy supply. The government is aware of that deficit and accordingly, the 11th Five-Year Plan targeted creation of 78.7 GW of additional on-grid generation capacity. However, current realisation may not exceed 50 GW, apparently largely on account of poor project implementation, inadequate domestic manufacturing capacity, shortage of power equipment, and slowdown due to lack of fuel, particularly coal. With more than 80,000 MW of new power capacity already under construction, the 12th plan is targeting 100,000 MW of new power capacity during the next plan period (GOI, 2011). While the targeted capacity is ambitious, failure to realise it will escalate the energy crisis in India, adversely affecting economic development.

It is projected that for a 9% growth rate, India requires energy supplies to grow at 6.5% to 7.0% per year (GOI, 2011). Import dependence on petroleum has always been high and is projected to be 80% in the 12th Five-Year Plan (2012-2017); the same holds true for coal. At the same time, India is suffering from severe power shortages of nearly 10% in average energy generation and almost 17% in terms of peak demand (TERI, 2009), negatively affecting the business sector especially. The recent blackout in Delhi and large parts of North India due to a grid failure, which left 300 million people without energy for hours, highlights the infrastructure woes of the country. In order to sustain adequate levels of growth and to improve social development, access to energy – in adequate quantity and stability – is a prerequisite.

India's energy mix comprises both non-renewable (coal, lignite, petroleum and natural gas) and renewable (wind, solar, small hydro, biomass, cogeneration bagasse, etc.) energy sources. Even though coal dominates the Indian energy mix, contributing over 50% of the total primary energy production (Coal India, 2012), and is expected do so in the future, the promotion of renewable energy in India is gaining importance. This can be seen with the announcement of the National Action Plan on Climate Change, which calls for strengthening the share of renewable contribution to energy generation from 2% to 5% with specific emphasis on significantly increasing solar (IECC, 2011). The necessity to move away from largely fossil-fuel-driven energy generation to clean and renewable energy results not only from environmental concerns but from increasing scarcity of fossil resources, a rising dependency on imports, and the need for additional and reliable power generation capacities. This is intensified by the fact that India's success in establishing new oil reserves and effectively exploiting its natural gas reserves has been limited.

Wind energy is seen as the renewable energy source with the most potential, followed by biomass and small hydropower. The wind energy sector expanded heavily in recent years, with an installed capacity of more than 14,158 GW in 2011, now ranking fifth in the world. With the current level of technology, the on-shore potential for utilisation of wind energy for electricity generation in India is estimated to be four times higher (INWEA, 2012). Nevertheless, it is predicted that the share of renewable energy in India's energy mix will be around 16% over the 2020-2030 period, with coal remaining the major source at about 48% in the next 20 years (BP, 2012). The discussion around green energy hence also needs to include a discussion around making thermal power generation cleaner.

India's energy policy provides a good illustration of the complexities of policy-making and the challenge to create policy coherence: While the Planning Commission provides an overarching framework through its Integrated Energy Policy, various ministries are responsible for different energy sources, e.g. petroleum, coal, power, water resources (in the case of hydroelectricity), atomic energy, and new and renewable energy. Several other ministries are also involved in

determining policies that affect energy demand (Transport, Urban Development, Industry, Steel, etc.) and the Finance Ministry determines tax rates for different fuels. Policies applicable to different energy sources hence need to be consistent with each other, and the overall framework for energy must be consistent with achieving the objective of inclusive growth (Planning Commission, undated). In many areas, policies relevant to energy are in the hands of state governments, e.g. urban transport, city planning, building codes, etc., and these policies also need to be made consistent with the overall energy policy at a national level.

'Land acquisition' has become a theme of escalating contention between rural and industrialised India. Widening economic disparities pose a risk to social stability, calling for serious efforts for an inclusive growth. With the increasing alternative economic uses of land – like agriculture, industry and infrastructure – farmers and traditional livelihoods are increasingly challenged. Land that is well connected to markets is scarce in India. In addition, communities are increasingly under pressure to give up their land for developmental activities like mining. Land acquisition by the state for developmental purposes is currently conducted under the Land Acquisition Act of 1894, a law of colonial origin that is often blamed for conflicts over land. Much debated in the discussion around the new bill is the question what is 'just' compensation and a fair price for land. The challenge that the government is facing is how to allocate a scarce resource such as land, which also has multiple uses, in an environmentally sustainable fashion.

International Drivers

While domestic drivers are most influential in shaping the new growth paradigm, India's integration into the world economy and international commitments and negotiations are playing a significant role in pushing India towards an alternative development path. India is a part of the G-20 and the BRICS and contributes to shaping the global governance agenda. Since India wants to be recognised as a regional power and global player, it is a signatory to many treaties and negotiations on climate change, such as the United Nations Framework Convention on Climate Change (UNFCCC). These commitments also affect the domestic policy agenda and environmental, as well as economic, reforms in the country. India's priorities are influenced by a set of interlinked factors, especially concerning energy and climate change. Although India's per-capita emissions of 1.5 metric tons are by far lower than the global average of 4.49 tons (World Bank, 2008), it must be taken into account that around 404 million people in India have no access to energy and hence the per capita emissions of those who do is much higher (IEA, 2010). While India's environmental performance may have international impacts, especially since its rapid economic expansion in the last decades, the country has to meet its growth objectives. MoEF acknowledges that 'the rapid pace of economic integration has led to interlinked world markets and economies, requiring a degree of synchronisation of national policies across a number of issues.' The failure to address adverse environmental spillovers of India's economic expansion poses a risk for its neighbours and the international community (Esty and Ivanova, 2004).

While most sustainability challenges are not new, globalisation has directly or indirectly exacerbated many challenges, for instance climate change and food prices, to a degree where they are now dealt with as matters of global and national security. It is estimated that the production of paddy will fall by 6.48% to 85.59 million tonne, while output of coarse cereals is estimated to fall by 18.38% to 26.33% (Business Standard, 2012). The shortfall from the supply side would push prices upward by encouraging speculative buying and hoarding, hitting hardest the poorer sections of the society. Furthermore, the current international crises, India's downturn, and stiff international competition reveal the need for India to reposition itself in regional and global markets and to develop dynamically its competitive advantage.

Private Sector Drivers

While the Indian government takes a leading role in setting the development path, the private sector has become a key actor in recent years due to its growing share in the economy, influencing the development agenda of the country. As a primary driver of economic growth and employment creation, the private sector plays a central role in reducing poverty. In recent years, India has witnessed many companies becoming innovators of products, processes and business models that integrate sustainability into their business DNA: While large corporations like ITC or TATA seem to be leading in this race, many MSMEs are also successfully developing solutions that address social or environmental challenges (GOI, 2011). For instance, Jain Irrigations has successfully brought irrigation systems to rural farmers, thereby raising their incomes through the efficient use of water, energy and fertilisers.

Efforts to promote innovative businesses with a sustainable outlook are also undertaken by the National Innovation Council (NInC), Centre of Excellence for Sustainable Development of the Confederation of Indian Industry (CII-ITC-CESD) and other initiatives, such as the recently launched Millennium Alliance by USAID and the Federation of Indian Chambers of Commerce and Industry (FICCI). They aim to strengthen such sustainable and inclusive innovations, e.g. through helping innovative businesses to access seed and venture capital. For small business, integration into international supply chains and factors such as standards and buyer requirements are key drivers for adopting sustainability practices. Some of the larger businesses, such as ITC and TATA Group, have adopted sustainable business models motivated by their own initiative, as a factor to gain competitive edge, spurring innovation and creating a market for products (CII, 2007). Economies of scale have also benefitted the larger businesses in terms of costs savings (on the risk management side) and exploring and investing in new markets (on the opportunity side).

Domestic Drivers

Growing environmental concerns and adoption of international best practices have led to an improved environmental governance apparatus in the country. Until now, India has heavily relied on regulatory instruments, such as inspections, clearance certificates and emission cuts, to ensure compliance. India has an elaborate legal framework with over 200 relating to environmental protection. While MoEF gives ‘green clearances’ to businesses, since 2010 a National Green Tribunal has been responsible for effective disposal of cases relating to environmental protection and conservation of forests and other natural resources, including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property. The media and civil society are also increasingly monitoring the environmental and social impacts of the private sector. Consumer awareness, however, is still in a nascent stage in India. Despite some degree of progress, monitoring of compliance remains a major challenge, especially with regard to the MSME sector, which is currently contributing about 70% of the industrial pollution (MoEF).

Some of India’s large businesses drive the green growth agenda of the country and practice sustainability practices beyond compliance. Businesses like ITC, TATA and Mahindra increasingly acknowledge the business case and integrate sustainability holistically in their business model and management. The Indian companies who report according to Global Reporting Initiative’s sustainability reporting framework show that businesses see a value of managing, monitoring and reporting on their sustainability performance. While improved brand reputation is cited as the most common reason for adoption of new sustainable models, stakeholder consultations also revealed numerous other reasons. Among the other benefits cited were increased competitive advantage, better innovation of products and services as well as business models and processes, and reduced costs. Besides internal drivers for adopting sustainable business practices and performance, companies are seeking to meet a variety of stakeholder demands for increased transparency and sustainability. A recent study provides evidence that consumers prefer ethically certified products over non-certified alternatives and are willing to pay a price premium for such products (Sequiera, et al., 2011).

International Drivers

Integration into the world economy has obliged export-oriented private sector companies to comply with international environmental and social standards and adopt more sustainable business practices. To access markets and capital, companies have to meet the listing requirements of international stock exchanges, and increasingly these exchanges are influencing sustainability practices of the companies. MSMEs with links to global value chains, for example in the textile sector, realise that international buyers increasingly look for sustainability performance and compliance to international social and environmental standards (e.g. ISO 14000, REACH). The influx of FDI, mostly by large multinational companies, often stimulates increased attention to environmental issues amongst domestic businesses, particularly where the latter undertake subcontracts that encourage or require them to comply with certain practices. As a recent trend, banks and investors look for non-financial performance, assessing risks related to the company's environmental, social and governance performance.

The establishment of subsidiaries by Indian companies in countries relatively more advanced in implementing environmental and social standards exposes them to better environmental and social governance practices. This exposure enables them to implement similar practices at home, which might also lead to an overall improvement in the environmental and social governance apparatus. Spillover effects of the adoption of such practices and environmentally friendly technologies may reduce adverse impacts on the environment and improve working conditions, potentially having a multiplier effect on socioeconomic conditions in general.

3.2 The current policy environment

This section presents an overview of the current high-level policy guidance provided by the central government. In a federal country like India, which is characterised by its diverse structure, central-level policy-making relies in large part on state and local administrative levels to develop and implement strategies. Accordingly, national policies require customised implementation strategies at regional and local levels. Therefore, practical implementation of national policies differs between different Indian states. To ensure that regulations lead to their desired outcome, specific road maps for implementation that are tailored to the conditions of individual states could be an answer, taking into account the specific political processes of each individual state (see Bennett 1991: 229). Hence, other aspects, such as policy conditions, public opinion, the role of experts, and resource constraints, also need to be analysed (Pande, 2001).

Umbrella Policies

Taking India to a green or sustainable and inclusive growth path requires integrated and coordinated action across different ministries and other key stakeholders like the private sector. Unlike other countries in Asia, such as Vietnam, which is currently developing a green growth strategy as a basis for restructuring its economy and growth model, India lacks a coherent and comprehensive policy framework, and efforts are often uncoordinated or taking place in political silos.

However, different framework policies exist, providing an orientation for sustainable and inclusive growth in India. This section introduces the umbrella policies governing the green and inclusive growth agenda in India. The authors recognise that the set of policies discussed below are limited, and the aim is not to analyse each one in depth but rather to understand the policy landscape in order to identify and select case studies that will be thoroughly studied subsequently.

The Constitution of India

The Indian Constitution includes environmental protection rights and duties. It specifies that the State shall endeavour to protect and improve the environment and to safeguard the natural resources of the country. According to the Constitution, it is the fundamental duty of every citizen of India to protect and improve the natural environment and to have compassion for living creatures. By raising environmental concerns to the constitutional level, India has provided its citizens with a powerful policy tool to protect the environment.

12th Five-Year Plan (2012-2017)

India's 12th Five-Year Plan, titled 'Faster, Sustainable and More Inclusive Growth', explicitly emphasises sustainable growth for the first time, reflecting a shift in the development priorities of the country. The Indian economy has been steered by five-year plans (FYP), which are developed, executed and monitored by the national Planning Commission, since 1951. While poverty reduction and growth have been on the agenda for a long time, environmental concerns and social inclusion featured as a priority only in the current plan.

Table 2: Key focus of India's five-year plans between 1951 and 2012

India's Five year plans:*

Plan	Timeline	Key feature
First	1951-56	Agriculture led
Second	1956-61	Socialistic Industrial Policy
Third	1961-66	Self reliance in agriculture and industry (Plan affected by wars with China and Pakistan in 1962 and 1965 respectively), price stablisation
Fourth	1969-74	Society oriented (education, employment and family planning)
Fifth	1974-79	Non-economic variables
Sixth	1980-85	Infrastructure (Six per cent per annum growth achieved)
Seventh	1985-89	Welfare sector, programmes such as Jawahar Rozgar Yojana
Eighth	1992-97	Dismantling license prerequisites and reducing trade barriers
Ninth	1997-2002	Agriculture and rural focus
Tenth	2002-07	Globally competitive growth
Eleventh	2007-12	Employment and social indicators
Twelfth	2012-17	Sustainable and inclusive growth

*India had three annual plans between 1966 and 1969

Source: Dogra, 2011 as cited from Planning Commission.

Compared to China, where the focus has started to move away from the quantitative rate of growth to the quality of growth, India's FYP is still focused on realising a high rate of growth only (9% or beyond to 9.5%) (Dogra, 2011). The approach paper to the 12th FYP sets a wide variety of targets to be achieved in the coming five years; some emphasise inclusion more than environment goals, while others focus on economic growth.

The main targets include

- Creating 100 million additional jobs in the manufacturing sector by 2025 in order to considerably absorb the additional 250 million to the working population;
- Reducing the inflation rate by bringing down its Wholesale Price Index (WPI) from the current 7.55% to 4.5-5%; and
- Achieving an average growth rate in the agricultural sector of 4%.

Specific issues identified towards environmental management are

- Increasing the share of new and renewable energy to 15% by 2020;
- Securing ecology of watersheds and catchments;
- Obtaining Cumulative Environmental Impact Assessments (CEIAs) for vulnerable regions;
- Carrying capacity studies in selected river basins;
- Maintaining acceptable water quality and quantity by controlling pollution of water resources;
- Restoration of wetlands and lakes; and
- Managing wastewater discharge from industrial and commercial establishments.

In order to develop a road map for a transition to a low-carbon economy, the Planning Commission set up an Expert Group on Low Carbon Strategies for Inclusive Growth. The recommendations provided to the Planning Commission in an interim report focus on power, transport, industry, buildings and forestry (GOI, 2011). To combat climate change and to reduce effectively India's emission intensity over the years, the 12th FYP stresses the need for action on the following:

- Research and Development (R&D). Increasing spending on R&D from the current 0.9% to 2% of GDP by the end of 2017, recognising the importance of research for breakthrough innovation in key sectors like energy, water management, farm production, medical research, and waste disposal;
- Promoting the development of clean energy sources. On the supply side, the focus is on developing hydropower as well as solar, wind and second-generation biofuels, as well as adopting supercritical technology in coal-based thermal power generation. On the demand side, accelerating the adoption of super-efficient appliances through a combination of market and regulatory approaches is emphasised;
- Expanding and improving efficiency of public transport systems and promoting fuel efficiency in vehicles through regulatory and market-based approaches. Improving efficiency of rail freight transport and completing a dedicated rail corridor;
- Developing financing mechanisms that are transparent and equitable to enable existing energy-intensive, small and medium plants in industries like iron, steel and cement to adopt green technology at an accelerated pace; and
- Developing agro-climatic zone-specific water harvesting and management technologies to enable rural communities to become resilient to the effects of climate change. Another measure is the development and genetic improvement of agricultural crops to develop a flexible portfolio of plant varieties that can thrive under extremes.

National Action Plan on Climate Change, 2008

In response to international trends and negotiations, in 2008 India launched the National Action Plan on Climate Change (NAPCC), its plan on mitigation and adaptation. The plan includes India's voluntary commitment to reduce by 20-25% the emissions intensity of its GDP by 2020, which also will help in achieving its energy goals (CDKN, 2012). Together with the 12th FYP, the NAPCC creates the broader framework for sustainability-oriented policy measures. The NAPCC outlines the government's overall strategy for confronting the challenges posed by climate change. Within the NAPCC, the government identifies eight targets called the National Missions, which form the core programme to 'achieve national

growth objectives through a qualitative change in direction that enhances ecological sustainability'. The eight National Missions are

- National Solar Mission;
- National Mission for Enhanced Energy Efficiency;
- National Mission for Sustainable Habitat;
- National Water Mission;
- National Mission for Sustainable Himalayan Ecosystem;
- National Green India Mission;
- National Mission for Sustainable Agriculture; and
- National Mission for Strategic Knowledge for Climate Change.

The implementation of the National Missions is a cross-cutting task that requires several ministries to work in coordination. This poses a real challenge given the lack of effective coordination between ministries on climate change issues so far. In fact, the governance structure of some Missions already mirrors this need for a cross-sectoral approach. For example, the National Solar Mission is steered by an inter-ministerial steering group, chaired by the Minister for New and Renewable Energy and composed of representatives from all relevant ministries and other stakeholders.

Under the NAPCC each state is also required to draft and submit its own State Action Plan on Climate Change (SAPCC). This provides an opportunity for every state to identify pertinent issues with respect to climate change and subsequently act on them. In this context, Himachal Pradesh became the first Indian state to embark on a road to becoming carbon neutral by 2020 after negotiating a large (US$450 million) loan on sustainable environmental growth and climate change with the World Bank.

Integrated Energy Policy (IEP), 2006

The Integrated Energy Policy (IEP) developed by the Planning Commission and adopted by the Indian government in 2006 draws up an energy policy for India with a view to reliably meeting the demand for energy services of all sectors at competitive prices and hence lays out India's energy strategy for the next 25 years. The IEP assumes that a GDP growth rate of 8-10% is necessary to alleviate poverty, involving a significant increase in the demand for energy from all sectors. It identifies that coal shall remain India's most important energy source until 2031-2032 and possibly beyond. In this context it emphasises setting up clean coal combustion technologies and pursuing new coal extraction technologies given the increasingly high demand for coal. However, it stresses that the country would need a paradigm shift for the energy sector as a whole, in view of the social, economic and environmental impacts of fossil fuels and their limited availability. Therefore, the approach of the Commission is directed to realising a cost-effective energy system and meeting the increasing energy demand through safe, clean and convenient forms of energy at the least cost in a technically efficient, economically viable and environmentally sustainable manner. The IEP gives recommendations with a focus on efficiency improvement, Demand Side Management (DSM), correct pricing of energy, R&D on alternative energy forms, equity in energy availability to the poor, and Energy Service Companies (ESCO). It presents four strategies as responses to India's energy-related challenges: (1) energy diversification and efficiency; (2) catalysing investment in energy diversification; (3) energy by a combination of market competitiveness, regulatory intervention, energy pricing changes and effective subsidies, strengthening diplomacy; and (4) demanding accountability for environmental externalities. In sum, the IEP provides a comprehensive set of energy policy recommendations for the government to achieve economic growth and to address adverse environmental impacts and security concerns.

In the context of securing energy supply, the IEP recommends increased use of traditional and alternative sources, such as oil, liquid natural gas, nuclear and renewable energy. The

emphasis is still on coal use, which the IEP indicates may provide most of India's energy needs even beyond 2030. In addition to deepening traditional energy production, the IEP underlines the increased importance of renewable energy and energy efficiency. While it suggests the utilisation of time-bound subsidies to spur investment in renewable energy, policies to minimise energy intensity are further stressed. The IEP also proposes additional measures, such as energy-efficiency labelling, public transport development, production of fuel-efficient vehicles, and increased R&D in technological innovation by funding educational institutions (GOI 2006).

The government has been partially successful in achieving some of the IEP goals. Substantial efforts were undertaken to increase the alternative and renewable energy generation capacity. Additionally, the National Electricity Policy, 2005, and the Tariff Policy, 2006, promote renewable energy investment by pricing it competitively with conventional energy. The IEP also led to further policies that resulted in the introduction of labelling requirements and building codes in an effort to reduce energy intensity and the energy-efficiency trading scheme 'Perform, Achieve, Trade (PAT)' further elaborated on below.

National Environment Policy (NEP), 2006

The National Environment Policy (NEP), 2006, creates an integrated approach for environmental conservation, livelihood protection and the integration of environmental concerns into economic and social development. Building on earlier policies, the NEP shows the government's commitment to improving environmental conditions while promoting economic prosperity nationwide. Its key environmental objectives include conservation of critical environmental resources, intra-generational equity, livelihood security for the poor, integration of environment in economic and social development, efficiency in environment resource use, environmental governance, and enhancement of resources for environmental conservation. The MoEF is responsible for implementing the NEP, which promotes mainstreaming of environmental concerns into all development activities, advocating important environmental principles and identifying regulatory and substantive reforms. With respect to regulatory reforms, the NEP recommends revisiting the policy and legislative framework, including application of a mix of civil and criminal sanctions, adoption of innovative economic instruments, and public-private partnerships in strengthening environmental compliance and enforcement. While the NEP acts as a key policy document that lays down the principles for sustainable development, it does not give orientation for an economic restructuring and integrating of environmental concerns into socioeconomic policy-making, but has a focus on environmental conservation (Singh, 2009).

National Manufacturing Policy (NMP), 2011

While MoEF is seen as the primary authority for sustainability concerns, sustainability measures are slowly being integrated in policies of other Ministries as well. The National Manufacturing Policy (NMP) announced by the Ministry of Commerce and Industry (MoCI) in 2011 targets a 25% share of manufacturing in GDP until 2025 (MoCI, 2011). The emphasis is on ecological sustainable manufacturing, ensuring environmental sustainability through the utilisation of green technologies, improving energy efficiency, improving utilisation of natural resources and restorating of degraded ecosystems. The policy promotes the integration of sustainable production into business practices for India's 27 million MSMEs, which are extremely important for both the Indian economy and society. However, it remains silent on how MSMEs are supported in making this transition. Limited access to capital and technology, underdeveloped infrastructure, inadequate R&D opportunities and the lack of awareness of technological alternatives constrain MSMEs to acquire environment-friendly technologies. To enable a sustainable transformation of the sector, incentives and support mechanisms to upgrade technologies will be needed. Although it is still too early to analyse the success of implementation and impacts, embedding ecological concerns in the NMP of 2011 reflects the rising importance of sustainability in economic policies.

Regulatory approaches

Regulatory approaches require government agencies to restrict or direct the activities of regulated parties using terms and conditions within statutory and regulatory instruments, operating permits, licences, approvals or codes of practice. A regulatory approach to environmental management is more prescriptive in nature, e.g. capping pollution levels or mandating the use of a type of equipment to meet certain requirements. Such measures include technology standards or performance-based standards. These may be specified for a whole sector or for an industrial process that is used across several sectors. While the effectiveness of such a regulatory or 'command and control' approach is strong in theory, much depends on its implementation and the strength of the regulatory body and its control mechanisms and institutions.

Environmental Impact Assessments (EIAs)

A key instrument set up by the Indian government to counter environmental degradation and adverse impacts of development on society is the Environmental Impact Assessment (EIA). The purpose of EIAs is to identify, examine, assess and evaluate the likely and probable impacts of proposed projects on the environment and, thereby, to work out action plans to minimise adverse impacts. If the adverse effects of an investment project outweigh the proposed benefits, clearances should not be granted, and the project should be relocated or terminated. EIAs were introduced in India based on the Environmental Protection Act, 1986. This made mandatory EIAs and environmental clearance from the central government for a list of projects in 29 categories. By integrating environmental concerns in developmental activities at the time of initiating and preparing the feasibility report, an EIA aims to identify any adverse environmental impacts of a project and the appropriate countermeasures right from the start. The EIA also considers implications of the investment for local communities potentially or actually impacted. By contaminating land and soil, investments might cause loss in productivity, leading to water scarcity by lowering the water table, which also directly affects the socio-economic conditions of the impacted communities.

Despite a sound legislative, administrative and procedural set-up, EIAs have not yet evolved satisfactorily in India, since they are often used as a project-justification tool rather than a project-planning tool to achieve sustainable development. Reports of scams and corruption, illegal development activities and misuse of the law have rendered efforts to contain environment degradation ineffective. For instance, despite imposing EIAs and mandating businesses to obtain clearances, the mining industry in the country has continued to displace communities and threaten livelihoods, biodiversity and ecological sustainability. An appraisal of the EIA system against systematic evaluation criteria revealed inadequate capacity of EIA approval authorities, deficiencies in screening and scoping of clearances, a poor quality of EIA reports, inadequate public participation and weak monitoring mechanisms. While these shortcomings are challenging, MoEF is continuously working on removing the existing constraints (Panigrahi and Amirapu, 2012).

Star rating and labels

The Bureau of Energy Efficiency (BEE) was established under the Energy Conservation Act, 2001, with one of its key functions to develop minimum energy performance standards and labelling systems for equipment, appliances and buildings. The star-based rating system, which focuses on energy efficiency, awards one star for the least energy efficient and five stars for the most energy efficient. Star Labels provide standardised energy-efficiency ratings for different electrical appliances and indicate energy consumption under standard test conditions. This initiative has played an instrumental role in providing information on energy performance, enabling consumers to make informed decisions when purchasing appliances with a focus on simultaneously saving energy and costs. The star-labelling programme offers an interesting case for learning, when compared against the performance of other labels, such as the 'Ecomark', which was launched in 1991 by MoEF, and helps in understanding how incentive

mechanisms for such labels should be structured to achieve maximum impact. Another area for research would be to look at the potential for labels to spur innovation by making businesses compete for better but also affordable technologies.

Guidelines on Sustainable Development for Central Public Sector Enterprises (CPSEs), 2012

The Ministry of Heavy Industries and Public Enterprises recently introduced guidelines that oblige Central Public Sector Enterprises (CPSEs) to contribute to sustainable development. The guidelines specify the mandate and scope of activities to be performed by CPSEs, obliging CPSEs with a net profit of less than US$18 million after tax to invest at least 0.5% of that profit in activities and projects to improve sustainability, and CPSEs with profits exceeding $18 million after tax to invest US$90,000 plus 0.1% of those profits (GOI, 2012). A list of suggested activities and projects to be performed by the CPSEs includes measures on emission reduction, low-carbon strategy development and implementation, greening the supply chain, and sustainable development training for employees (GOI, 2012). The compulsory reporting could have a catalysing role in improving environmental performance of some of the most polluting industries, such as coal and steel.

E- Waste (Management and Handling) Rules

The E-Waste (Management and Handling) Rules provide an example of the government's attempts to strengthen market development of green services such as recycling. Rapid product innovations and replacements combined with the rise in digital technology have resulted in growing e-waste streams. The framework brings focus on the fulfilment of extended producer responsibility and the need for environmentally sound processes through authorised recyclers. Waste management is a sector in which more private sector engagement is required to solve India's challenges; however, functioning markets are needed. As per the rules, the e-waste generated by any individual, institution or bulk consumer needs to be disposed through organised recyclers approved by the Central/State Pollution Control Board. These rules apply to every producer, consumer and bulk consumer involved in the manufacture, sale, purchase or processing of electronic equipment or components. Producers and manufacturers of electrical and electronic equipment will be responsible for recycling of e-waste arising from their products. Currently, recycling is largely done in a rather unorganised manner. If implemented correctly, new formal employment opportunities could be created leading to green jobs in the formal recycling sector. Producers have to make consumers aware of the hazardous components present in the product and provide instructions for handling the equipment after its use along with the do's and don'ts. As many different interests are involved in making the implementation of this policy work, a political economy analysis would result in a better understanding of incentive mechanisms, from where recommendations for implementation could be developed.

Market-based approaches

Market-oriented, or market-based, approaches create financial incentives for the private sector to incorporate environmental concerns and pollution abatement into production or consumption decisions and find innovative solutions to continuously reduce abatement costs. They can differ from more traditional regulatory methods in terms of economic efficiency (or cost-effectiveness) and the distribution of benefits and costs. They include taxes, subsidies and cap-and-trade systems. Economists generally favour market-based policies over more traditional regulatory methods because they tend to be less costly, place a lower information burden on the regulator, and provide incentives for innovations. However, the role of market-based instruments is still limited in India. There have been certain experiments but the scope and potential impact of these instruments remains unexplored.

Environmental Fiscal Reform

Environmental fiscal reform (EFR) creates price signals for producers and consumers, which encourage them to reduce pollution as well as energy and resource use. It encompasses the phasing out of environmentally harmful subsidies as well as the introduction of environmental taxes, charges and fees, which ensure that polluters pay for adverse environmental effects, incentivising a shift to more environmentally friendly behaviour. EFR can reduce abatement expenditure of negative environmental impacts, generate revenues, spur innovation and improve competitiveness and technological upgrading of businesses.

Although the NEP recognises the importance of economic instruments in achieving environmental goals, and the current 13th Finance Commission is emphasising the importance of incentivising green fiscal policies (FC, 2009), the use of fiscal instruments to promote environmental objectives in India has remained limited. A case study could undertake a broader political economy analysis of EFR, focusing on selected examples of EFR implementation in the Indian context. At the same time it could study how EFR may play a decisive role in improved implementation of certain legislations, for instance solid waste management and enhancement of resource efficiency.

Fossil fuel subsidies

The government of India recently began rolling back fossil fuel subsidies with a view to containing India's fiscal deficit. The government spent over US$9 billion in 2010-2011 on subsidising fuel products: diesel, kerosene, LPG and, to a lesser extent, gasoline. Together with food and fertiliser subsidies, the government's total subsidy expenditure in 2011-2012 represented an increase of nearly 27% and significantly contributed to the deterioration of India's fiscal balance (IISD 2012). The government has announced its goal of reducing total subsidy expenditure to 2% of GDP in 2012-2013 and further reducing it to 1.75% in following years. While the key factor behind these efforts is lack of funds, this cut in subsidies will have positive effects for the environment and the dependency of India's economy on fossil fuels. Price increases are also expected to impact production costs and may spur energy efficiency in enterprises and incentivise adoption of alternative sources of energy. A concern of the current ad hoc reduction, however, is the lack of a structured approach to the phasing out of fossil fuels and the implications this may have for the future. The impact on the poor and MSMEs, in particular, as well as possible measures to reduce unwanted adverse social and economic effects should be analysed.

Trading schemes

Trading schemes have been launched recently in India and are meant to play an important role in achieving reduced emissions and low-carbon development in the most energy intensive sectors in India. The rationale behind emission-trading schemes is that they cap emissions at a given rate and allow emitters to trade emission rights among themselves in a market, leading to an efficient allocation of emissions. With similar logic, performance-related trading schemes set benchmarks – for energy savings, for example – and require underperformers to buy certificates (or pay fines) while producers that exceed the benchmark receive tradable certificates they can sell to underperformers. Being fairly new in India, little is known about the impact of these programmes. However, they do have the potential to contribute significantly to the concept of green growth.

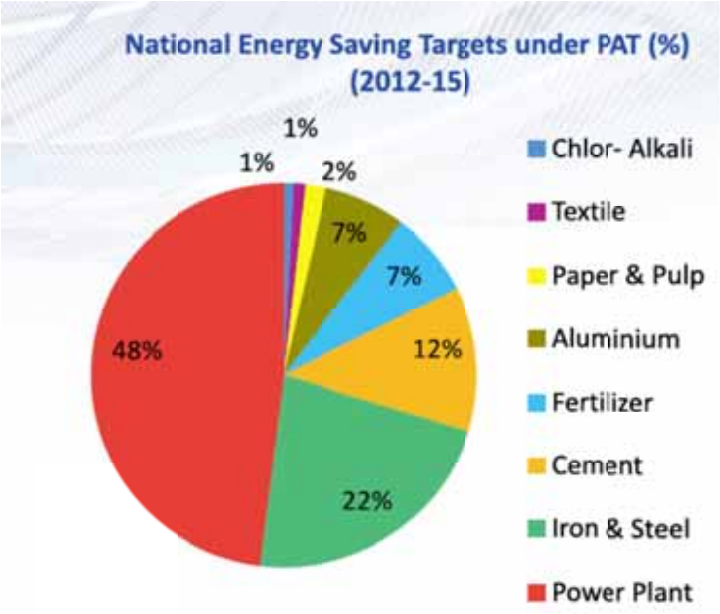
Perform Achieve and Trade Scheme (PAT), 2012

The PAT is a performance-related trading scheme introduced by BEE under the Ministry of Power in 2012 to enhance energy efficiency in energy-intensive large industries. In March 2007 BEE identified as Designated Consumers, for this purpose, industrial units and other establishments consuming energy more than the threshold in nine sectors, namely Thermal Power Plants, Fertiliser, Cement, Pulp and Paper, Textiles, Chloride-Alkali, Iron and Steel, Aluminium, and Railways. These Designated Consumers account for 25% of the GDP and about

45% of the commercial energy use in India. The 500 companies identified as top consumers of power account for nearly 65% of the power consumed in the manufacturing sector.

Under this scheme, industries failing to achieve the defined energy-efficiency targets set for 2014-2015 are required to pay more than US$185 per tonne of oil-equivalent beyond the target. Companies that surpass the energy-efficiency targets receive energy saving certificates that can be sold through a market mechanism to companies that fail to meet the target. The scheme is expected to enable the Indian industry to progressively reduce its energy intensity and strengthen its bottom line. Beyond improving energy efficiency in these target sectors, PAT is also expected to reduce emissions and related adverse environmental impacts significantly as well as reduce the stress on India's overstrained energy system. While the scheme imposes costs – for technological upgrades or fines – the competitiveness of these industries should rise in the medium term. Furthermore, the demand for energy-saving technologies is expected to rise, offering an opportunity for service and technology providers within India. These various environmental and economic effects should be analysed further in depth.

Figure 4: National energy saving targets under the PAT scheme (2012-2015)



Source: PAT Scheme Manual, Bureau of Energy Efficiency, Ministry of Power.

Renewable Energy Certificates (RECs), 2010

The Central Electricity Regulatory Commission (CERC) introduced Renewable Energy Certificates (RECs) in 2010 to promote renewable energy generation and overcome geographical constraints. Each state in India has a Renewable Purchase Obligation (RPO) decided by the State Electricity Regulator (SERC), which defines a fixed share of electricity from renewable energies in their energy mix. Some states in India, like Tamil Nadu and Gujarat, are rich in renewable energy capacity, while others, like Bihar, Delhi and Maharashtra, are deficient. Under the (voluntary) REC scheme, renewable energy generators are granted certificates per MwH that they contribute to the grid. These RECs can be traded on exchanges and sold to entities that need the certificates to meet their renewable energy targets. Accordingly, this mechanism promotes renewable energy generation by providing an additional financing mechanism that overcomes geographical constraints.

While they are contributing to the expansion of renewable energies and accordingly reducing the environmental stress of energy generation, renewable energy companies and utilities are expected to benefit most from this policy in economic terms. This could add a significant rise in demand for service and technology providers of renewable energies. The overall environmental and economic benefits as well as the efficiency and effectiveness of the mechanism should be further analysed in depth.

Comprehensive fiscal policies for targeted industrial development – wind energy

In the face of the increasing demand for energy and the need to provide alternative and cleaner energy sources, the government of India has taken various steps to promote wind energy in the country by setting up an incentive structure to encourage private sector participation in clean energy technology. Wind energy is the fastest growing renewable energy sector in the country. The installed capacity for wind energy has grown at an annual rate of 19% to reach 14 GW in 2011 (EY, 2011). It accounts for nearly 70% of the installed capacity in the renewable energy sector in the country (Gyan Analaytics, 2012). Estimated future job creation ranges from 28,000 jobs to over 84,000 by 2020 and 113,000 by 2030 (GWEC, 2011). This increase can be attributed to various initiatives taken by the government of India.

Table 3: Growth of installed wind capacity in India

ANNEX 3: **AVERAGE SIZE OF WTG (KW) INSTALLED EACH YEAR**

	YEAR					
COUNTRY	2004	2005	2006	2007	2008	2009
China	771	897	931	1,079	1,220	1,360
Denmark	2,225	1,381	1,875	850	2,277	2,368
Germany	1,715	1,634	1,848	1,879	1,916	1,977
India	767	780	926	986	999	1,117
Spain	1,123	1,105	1,469	1,648	1,837	1,897
Sweden	1,336	1,126	1,138	1,670	1,738	1,974
UK	1,695	2,172	1,953	2,049	2,256	2,251
USA	1,309	1,466	1,667	1,669	1,677	1,731

Source: BTM Consult ApS, March 2010

Source: Lowres, 2011.

Accelerated Depreciation is considered one the main drivers for wind power projects in the past. It provides tax benefits for wind projects, allowing deductions of up to 80% of the value of wind power equipment during the first year of project operation. Investors are also provided tax benefits for up to 10 years. However, wind energy generators receiving accelerated depreciation are not eligible to receive Generation Based Incentives.

Generation Based Incentives (GBIs) for wind projects provide grid-connected wind energy projects up to 4000 MW an additional 0.5 Indian rupees (INWEA, 2012) per unit above the wholesale price. Companies are not allowed to use GBIs in parallel with existing fiscal incentives, including accelerated depreciation. GBI and accelerated depreciation benefits together are cited as the reason for the rapid growth of wind energy in India. After providing incentives amounting to approximately US$6.6 billion, the government of India rolled back the GBI in 2012 (ET, 2012). The industry is now lobbying to reintroduce the GBI, citing the recent dip in the industry as a consequence of the rollback.

Indirect Tax Benefits include concessions on excise duty and reductions in customs duty for wind power equipment. Indirect tax benefits for manufacturers of specific energy parts vary from 5-25% depending upon the component.

These combined measures represent a success story, contributing to the rapid extension of wind energy generation capacity in India, with more than 14,000 MW of total installed capacity, the fifth-highest capacity in global terms. An analysis of the economic sustainability and viability of these measures, their effects on MSMEs and job creation, as well as their contribution to a cleaner energy mix in India, could provide essential lessons for India itself as well as other countries facing similar economic, environmental and social challenges.

‘Green finance’ – financing sustainable and inclusive growth

India has implemented a number of initiatives that attempt to address sustainability concerns through market mechanisms. Fiscal instruments under the National Mission on Enhanced Energy Efficiency include tax exemptions for the profits made from energy-efficiency projects by ESCOs and Venture Capital funds, as well as a reduced VAT for energy-efficient equipment. A Partial Risk Guarantee Fund, a risk sharing mechanism, has been set up to provide commercial banks with partial coverage of risk exposure against loans made for energy-efficiency projects. The fund charges a small fee on all projects seeing the risk guarantee. The Ministry of New and Renewable Energy, which is responsible for these instruments, aims to increase the availability and reduce the costs of investment capital for energy-efficiency investments; however, there are no quantitative targets. In addition, to accelerate investments in energy efficiency and to support the PAT scheme, India’s Renewable Energy Development Agency (IREDA) has financing schemes for nine areas.[7] IREDA financial services include direct project financing, equipment financing, business development financing, loans for manufacturing facilities of energy-efficient equipment, and loans to banks and financing institutions for on-lending. These financial services are partly funded by the state budget. No information on impacts, costs and benefits is available on these instruments.

Voluntary and information-based initiatives

Voluntary and information-based initiatives are neither explicitly regulatory nor market-oriented and are increasingly used in practice. Often, these approaches combine elements of regulatory and market-based incentive policies. Examples of such measures include requirements for disclosure of environmental, social and governance aspects and performance. Disclosure requirements aim to minimise inefficiencies in regulation associated with asymmetric information, improving market transparency. Collecting environmental performance information and making it publicly available allows investors, government agencies and consumers to be better informed about the environmental and social consequences of their production and consumption decisions. Such instruments may encourage more environmentally and socially benign business practices. Without monitoring, however, information disclosure might not result in an efficient outcome.

National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business (NVGs)

The NVGs released by the Ministry of Corporate Affairs in 2011 promote responsible behaviour as a core business strategy beyond philanthropic activities and call on companies to integrate environmental, social and governance concerns into their core business practices. NVGs provide businesses a framework that enables them to move towards responsible decision-making and urges them to adopt the ‘triple bottom line’ approach.

The national voluntary guidelines consist of nine core principles, namely

- *Principle 1:* Businesses should conduct and govern themselves with Ethics, Transparency and Accountability;
- *Principle 2:* Businesses should provide goods and services that are safe and contribute to sustainability throughout their life cycle;
- *Principle 3:* Businesses should promote the well-being of all employees;

[7] The nine areas covered are: Small hydro power, medium and large hydro projects above 25MW, wind energy, bio-energy, solar energy, energy efficiency and energy conservation, biofuel/alternative fuel, new emerging technologies, and development activities/new initiatives.

- *Principle 4:* Businesses should respect the interests of, and be responsive towards all stakeholders, especially those who are disadvantaged, vulnerable and marginalised;
- *Principle 5:* Businesses should respect and promote human rights;
- *Principle 6:* Business should respect, protect, and make efforts to restore the environment;
- *Principle 7:* Businesses, when engaged in influencing public and regulatory policy, should do so in a responsible manner;
- *Principle 8:* Businesses should support inclusive growth and equitable development; and
- *Principle 9:* Businesses should engage with and provide value to their customers and consumers in a responsible manner.

One objective of the guidelines is to encourage the adoption of sustainability reporting and mainstream disclosure of environmental, social and governance policies, practice and performance of companies. The NVGs argue for a business case for the adoption of sustainable business practices. They put forward the view that this leads to enhanced revenue growth and market access, cost savings, increased access to capital, better risk management and improved brand value and reputation (MIT Sloan, 2009).

These guidelines were developed in a multi-stakeholder process and are supported by a number of Indian stakeholders, contributing to a consensus among public and private entities with regard to sustainable growth of the country. Since the release of the guidelines in July 2011, a number of other ministries and public bodies have created further policy instruments on the basis of the NVGs, like the Securities Exchange Board of India (SEBI) mandate mentioned below. While sustainability-oriented investors have welcomed this development, it remains to be seen whether a significant share of companies will voluntarily adopt and report according to the guidelines.

Environmental, Social and Governance (ESG) reporting, 2011

In 2011, the Indian capital market regulator, the Securities Exchange Board of India (SEBI), announced its intention to mandate the top 100 listed companies by market capitalisation on the Bombay Stock Exchange (BSE) to disclose information on measures undertaken to cover the key principles of the NVGs as part of their annual reports. More recently, in August 2012, SEBI published a circular formally setting out this mandate and requiring the inclusion of Business Responsibility Reports ('BR reports') as part of the Annual Reports for the top 100 listed entities (SEBI, 2012). This is to make sustainability performance information available for investors to refer to in order to support their investment decision-making process (GIZ, 2012). With this development, financial markets and investors become important actors to monitor businesses' sustainability performance.

Companies Bill, 2011

The MCA recently proposed the Company's Bill 2011, bringing the traditional understanding of CSR and philanthropy into the broader policy framework. While not mandating specific spending on CSR, it encourages companies with an investment of over $92 million or turnover of over $184 million of net profits to spend at least 2% of annual net profit on CSR activities (GOI, 2011). The CSR Policy under the Company's Bill indicates the scope of activities to be undertaken; it includes those with a focus on ensuring environment sustainability and social business, while also stressing gender quality, employment-enhancing vocational skills, etc. While the bill does not penalise non-compliance, it does mandate companies to disclose reasons in cases of non-compliance.

GREENEX

The Bombay Stock exchange launched the GREENEX index in 2012 that benchmarks the carbon footprint of companies. It identifies the top 20 companies based on estimated greenhouse gas emissions; free-float market capitalisation and turnover are included. The listed companies are relatively energy efficient and are meant to be further encouraged by the GREENEX to work towards improving their environmental sustainability. The index is targeted at retail as well as institutional investors, such as asset managers and pension funds, looking for investments in companies with strong long-term prospects and a low carbon footprint. GREENEX is expected to enable investors to take more informed investment decisions on companies according to their economic performance as well as carbon intensity. This responds to an increasing shift of investors' interests away from just the fiscal aspect of quantitative growth and towards more (environmentally and economic) sustainable business models. Accordingly, the BSE GREENEX aims to create a market-based response mechanism for businesses and investors to use quantitative and objective performance based signals, to assess 'carbon performance'. The index is expected to promote responsible business practices among other companies that pursue a listing in the GREENEX. This might in turn lead to a broader effect of the GREENEX, also within value chains of listed companies. The impact of such initiatives on investor decisions, their influence on consumer behaviour, and their effect on business's long-term strategic orientation provide a promising case for further in-depth research and lessons learnt.

Non-government initiatives

These initiatives are directed at specific sectors, industries and target groups to achieve environmental, energy-efficiency and green growth objectives in general through (1) requiring the private sector to set specific environmental or social goals, (2) raising private sector awareness and encouraging process improvements, (3) publicly disclosing private sector participation, and (4) labelling environmentally and socially responsible products. These methods are not mutually exclusive.

ITC Limited

As one of the most cited examples of a business that incorporates sustainability into its core business, a review of ITC (formerly known as the Imperial Tobacco Company) offers insight into how a business model can be socially inclusive as well as environmentally responsible while generating significant inputs and revenue for the company. For instance, ITC's Social and Farm Forestry Programme organises wasteland owners into forest user groups who are trained in silviculture, land development and plantation maintenance. Extension services support them with a package of loans and supplies of high-yielding, disease-resistant clonal saplings developed at ITC's R&D Laboratory at Bhadrachalam (ITC, 2012). The programme sets up a village development fund from the loans that are repaid from revenues and utilises the same to develop infrastructure, such as watersheds. It has provided 40 million person-days of employment, particularly among tribal and marginal farmers. Effectively feeding a social and environmental dimension to its business case, ITC has planted 365 million saplings to provide pulpwood for ITC's paper mills (ITC, 2012). While ITC is facing a lot of criticism, the initiative might be a good example of a company combining its need to improve and diversify its supply structure with environmental conservation and livelihood creation.

Green building movement

The concept of 'green buildings' is an approach to improve energy- and resource-efficiency in buildings, combining an array of practices and techniques to save water, energy and materials in the construction and operation of buildings. With an ever-increasing demand for commercial and residential space, environmental concerns in the building sector have given rise to India's

green building movement. Selected private sector actors in India are interested in pushing this agenda forward even without government intervention. The objective is to create a market to reduce the operating cost of buildings as well as the adverse impact of buildings on environment and health. Internationally, voluntary building-rating systems have been instrumental in raising awareness and popularising green buildings.

India currently has two major rating systems for green buildings, largely driven by the private sector. The Leadership in Energy and Environment Development (LEED) India, run by the Indian Green Building Council, mainly focuses on energy-efficiency measures in air-conditioned (AC) buildings. The Green Rating for Integrated Habitat Assessment (GRIHA), a system developed by The Energy and Resources Institute (TERI) and the Ministry of New and Renewable Energy, attempts to account for India's agro-climatic conditions and in particular the predominance of non-AC buildings. Accordingly, it is a 'green building design evaluation system', meant to suit all kinds of buildings in different climatic zones of the country. The green building movement in India began with a modest 6,000m^2 of green buildings in 2003, and today stands at more than 300,000,000m^2 with 1,400 registered green buildings projects, making India second in green building after the US (IGBC). Currently, the green building market is growing at a rate of 30-35% per year (CII-GBC, 2011).

The green building impetus has also resulted in significant cost reductions: whereas in 2004-2005 a 'Platinum' rated building used to cost 15% more to build than a regular commercial building, this premium fell to only 5% in 2011. Considering the savings in operating green buildings, the break-even point of investing in green buildings may be reached much earlier now.

Table 4: The Indian green building rating systems

LEED India Certification Levels		TERI-GRIHA Certification Levels	
Certification Levels	**Points required**	**Rating**	**Points required**
LEED Certified	26-32	One Star	50-60
LEED Silver	33-38	Two Stars	61-70
LEED Gold	39-51	Three Stars	72-80
LEED Platinum	52-69	Four Stars	81-90
		Five Stars	91-100

Source: Indian Green Building Council/The Energy Research Institute.

Since the construction sector is very important for MSMEs, it would be interesting to analyse the impacts of the green building movement on innovation and employment especially in MSMEs.

Selco Incubation Centre for South Asia

Social enterprises increasingly contribute to sustainable and inclusive solutions, for example in the field of renewable energy. Under the framework of Indo-German bilateral cooperation, the Indo-German Energy Programme (IGEN) is helping the Small Scale Sustainable Infrastructure Development Fund (S3IDF) set up an incubation centre to support social enterprises that deliver clean energy services to the poor. The centre supports replication of successful rural energy enterprises' business models in different underdeveloped states of India by providing business development services and facilitating peer-to-peer learning. The Bangalore-based solar lighting company SELCO represents the first model to be replicated in selected states of India. While it is difficult to quantify the total investment amount and turn over expected, the incubation centre expects participating entrepreneurs to receive seed funding, mostly grants, with the potential to generate revenue within only six months of investment. Selco Incubation

Centre estimates that two to three entrepreneurs would be ready for scaling up their business model by the end of two years.

Incubators support market development by helping entrepreneurs to engage in new markets successfully and to explore niches, finally incentivising other players also to enter the market. Accordingly, the intention is to shift away from a grant-based approach to a commercial approach, creating a market for the development and supply of clean energy solutions in various parts of the country. Apart from replacing fossil fuels through clean energy technologies in rural areas, the project has the potential to create employment opportunities in new markets for the economic 'bottom of the pyramid'. The programme expects medium enterprises to reach an average of 500 households per enterprise in the second year and 5,000 households per enterprise after five years. Similar models could be replicated in other green sectors. This pilot project could provide lessons learnt on setting up a decentralised structure to provide clean technologies as well as on business models that address the 'triple bottom line'.

Promoting energy-efficient technologies in small scale industries

Due to the importance of MSMEs for India's economy, initiatives on sustainable and inclusive economic development need to address and be appropriately designed for smaller industries, too. The following case could potentially generate significant learning as to how environmental concerns (energy and resource efficiency) could be incorporated into MSMEs without putting a financial burden on entrepreneurs. Under the framework of Indo-German bilateral cooperation, the Indian Institute of Corporate Affairs (IICA) and GIZ, funded by the Federal Ministry for Economic Cooperation and Development (BMZ) along with the Foundation for MSME Clusters (FMC), launched a pilot to embed and integrate best practices for 'Responsible Competitiveness and Inclusiveness' in MSMEs in 2010. Using energy efficiency as an entry point, the project focuses on strengthening cluster development and facilitating the adoption of energy-saving measures in foundry units across three foundry clusters in North India. These foundry clusters are usually very energy intensive and rely on inefficient production processes that have both negative environmental impact (pollution, air, water, land and noise) and social consequences for the MSMEs.

The project helped to introduce better technologies, leading to energy savings and carbon emission reduction in the three clusters. Cluster associations were supported with capacity building and started to play a significantly increasing role in (1) undertaking socially, environmentally and economically relevant cluster initiatives, (2) linking regional and national level initiatives to promote collective development goals, and (3) creating an enabling environment. The intervention reported an impact on workers' health and safety, with a reduced number of accidents, and increased revenue due to the enterprises' use of better technology, which led to a substantial reduction in the required quantity of coke. Beyond reducing the carbon footprint of the cluster, the estimated coke savings stand at 2,900 tonnes per annum. The carbon saved from energy-efficient practices can potentially be sold in the form of Certified Emission Reductions through CDM.

The success of the intervention is reflected in the scaling up of the project with funding by the European Union. It is expected that this upscaling will further reduce the carbon footprint significantly, improve competitiveness and provide demonstration for further upscaling among similar clusters in India and other developing countries.

Subsidised government programs

Besides the overarching and more specific policies mentioned above, the government of India also provides sector-, industry- and target group-specific incentives, subsidies and guidelines. Among these, the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) is probably the most renowned with also a lot of attention from the international sustainability discourse.

Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA), 2005

MNREGA is a job guarantee scheme that provides a legal guarantee of employment for up to 100 days per year to adult members of rural households willing to perform manual and unskilled public work at the statutory minimum wage of now approx. US$2.47. The objective is to promote job creation and skill development, to improve purchasing power of poor households in rural areas, particularly of women and minorities, and to contribute to environmental protection at the same time. Permissible activities focus on environmental preservation, predominantly water and soil conservation, afforestation and land development works. MNREGA is regarded as a best practice of 'Green Economic Policies' by the United Nations Environment Programme (UNEP) (Sukhdev, Stone, & Nuttall, 2010). Nevertheless, the scheme is debated controversially. While positive assessments claim environmental effects of the scheme in Karnataka and the generation of more than 3.5 billion days of work reaching on average 30 million families per year, the scheme is often criticised for bad implementation, corruption and ineffectiveness. The overall effect of MNREGA on poverty, job creation, skill development, wages and rural development as well as environmental protection could offer interesting lessons for such programs. Especially the long-term effectiveness of such a purely governmental approach should be assessed as well as how MNREGA could be enhanced by involving the private sector to deliver better quality, offer long-term employment opportunities and promote market-oriented skill development.

3.3 Proposed case studies for further analysis

Based on the policy mapping of the previous section, this section suggests case studies that could be of interest for a more detailed analysis of policies and instruments and testing of the 'triple win' hypothesis, i.e. economic growth, social inclusion/poverty reduction, and improvements in environmental sustainability. The policy mapping has shown that there are only a few policies that aim to meet growth and inclusion objectives at the same time. In addition, while the 12th Five-Year Plan, titled 'Faster, Sustainable and More inclusive Growth', serves as a framework for policy-making, no green growth strategy exists and hence policy coordination is low. The current kaleidoscope of initiatives is initiated by government actors that tend to operate in silos. Hence, there is no single policy that aims to restructure the current growth trajectory but rather a number of initiatives of which some focus more on environmental aspects while others emphasise either the need for increasing inclusiveness or economic performance in the country.

Few policies exist that explicitly aim to address economic, social and environmental aspects simultaneously. However, one example of a policy that does do this is the new NMP, which aims to boost the manufacturing sector while at the same time promoting sustainable production and inclusion of MSMEs. The next year will show how this policy is being implemented and what lessons can be drawn.

However, a number of policies or initiatives might still have the potential to deliver, or indeed may already demonstrate, these 'triple wins'. While most of the policies are aimed specifically at achieving just one or two of the three objectives of interest, we made an initial assessment of their potential to impact on all three of the objectives, when we were selecting the case studies for inclusion. We also selected case studies based on the extent to which it seemed there were particularly useful lessons to be learnt from the policy process or implementation mechanism. We also assessed the relevance of the case studies to other countries, particularly other emerging economies like China, in order to facilitate the comparison of different countries' approaches to similar problems, and to maximise the potential for wider lesson learning and knowledge exchange. Finally, we sought to identify case studies which had an interesting angle on the role of the private sector in achieving these triple goals.

Accordingly, the following list of policies and initiatives constitutes the proposed focus for the main research phase that is planned as the next step in this programme. The selection of the cases has been made on the basis of desk research and consultations with a view to generating valuable lessons to inform policy. The main research phase will entail in-depth

analysis of a selection of these case studies, to assess their impact to date or to set up a baseline and monitoring framework that will enable us to undertake impact assessment and lesson learning in real time, as the policies or initiatives are introduced and implemented. This will also enable the research to feed into policy development and adjustment, thus generating real practical value for policy-makers in the countries of focus, as well as lessons of relevance for policy-makers in other countries.

The two overarching questions for further research are

- What policy interventions have succeeded in incentivising or supporting business to undertake investment and innovation in green technologies and industries and greener business models?
- What impact has this had on incomes, poverty, jobs and the environment/carbon emissions?

Identified Case Studies	Overview
Generation Based Incentives for Wind Energy:	To encourage investment in wind power generation, the Ministry of New and Renewable Energy (MNRE) introduced financial incentives for all new projects commissioned since December 2009, including generation-based incentives, accelerated depreciation and indirect tax benefits. Wind energy is regarded as an opportunity to provide cheap, non-polluting energy solutions in rural areas where grid-connected solutions are not feasible.
Renewable Energy Certificates:	To further promote renewable energy generation, MNRE has been issuing Renewable Energy Certificates (RECs) since 2011. The projects eligible under this scheme are technologies in the field of wind, solar photovoltaic (PV), solar thermal, biomass and hydro power. RECs are to be issued for 1 MWh of electricity injected into the grid from renewable energy sources. These certificates, which remain valid for a year, can then be traded, on Central Electricity Regulatory Commission (CERC) approved power exchanges, to obligated entities or voluntary buyers to fulfil their Renewable Purchase Obligation/Social Responsibility[8](Soonee, et al., undated).
The Perform Achieve and Trade (PAT)	The Energy Efficiency Trading Scheme was introduced by the Bureau of Energy Efficiency under the Ministry of Power (MoP) in 2011 with the aim to reduce energy consumption in industries across India. The scheme currently affects designated consumers (DCs) in the following nine sectors: Power (Thermal), iron and steel, cement, fertilisers, railways, textile, aluminium, pulp and paper, and chloral and alkali. The scheme is a market-based mechanism to enhance cost effectiveness of improvements in energy efficiency of DCs, through certification of energy savings that could be traded. (Dube, et al., 2011).
The E-waste (Management	The rules were introduced in 2011 by the Ministry of Environment and Forests (MoEF), recognising the

[8] https://www.recregistryindia.in/pdf/REC_india.pdf

and Handling) Rules	necessity of proper recycling of electronic waste and attributing the responsibility to the producers. According to recent data by the Manufacturers' Association for Information Technology (MAIT), India generates about 380,000 tonnes of e-waste per annum, of which only 5% is recycled by formal recyclers; the remaining 95% is recycled in the informal sector.[9] The Ministry expects that the rules that came into effect in May 2012 will encourage companies to spearhead recycling initiatives and to promote sustainable consumption.
Innovation Cluster Initiative in the Foundry Sector	The Department of Science and Technology (DST) supported technology innovation in select foundry clusters (Faridabad, Samalakha and Kaithal) through its Innovation Cluster initiative in 2010. Since the foundry sector is one of the highest emitters of carbon, the initiative is targeting a sector with major environmental impact by MSMEs. This pilot initiative contributed to technological upgrading and better operational practices in at least 100 cupola-based foundries. Cluster-based associations have been involved to sustain initiatives in the areas of technology upgrading, product development, waste management and recycling, market development initiatives, and leveraging development initiatives with international partners. Measures to improve energy efficiency through better practices and technologies have led to annual savings of 4,300 tons of coal in these units and annual savings estimated at Rs. 5 crores (approx. €700,000).
Star Rating and Labelling Program	The Bureau of Energy Efficiency (BEE) launched the star labelling programme in 2006 as an energy-efficiency rating scheme for electrical appliances and buildings. Labels have been created to standardise the energy-efficiency rating of various electrical appliances and indicate energy consumption under standard conditions. The star-based rating scale ranges from one star for the least energy efficient to five stars for the most energy efficient. The focus is also to encourage informed consumer decisions based on energy efficiency during electrical appliances purchases. The programme has seen considerable success and enabled the creation of a market for energy-efficient equipment.
Selco Incubation Center for South Asia	Under the framework of Indo-German bilateral cooperation, the Indo-German Energy Programme (IGEN) as part of its Renewable Energy Component (IGEN-RE) is supporting the Small Scale Sustainable Infrastructure Fund (S3IDF) to set up an incubation centre to help social enterprises deliver clean energy services to the poor. The centre will make use of the expertise of successful rural energy enterprises. In turn it will support replication of these existing business models in underdeveloped Indian states by providing business development services and facilitating peer-to-peer learning. Entrepreneurs will

[9] http://bcas.du.ac.in/Conference_proceedings.pdf

	work towards creating a market mechanism for the development and supply of clean energy solutions in the country. The programme is geared towards supporting social entrepreneurs promoting clean energy solutions.
Mahatma Gandhi National Rural Employment Guarantee Act (NREGA)	The MNREGA was launched in 2005 with the objective to enhance livelihood security of households in rural areas of the country by providing at least 100 days of guaranteed wage employment in each financial year to every household whose adult members volunteer to do unskilled manual work. The target group for the act is the Below Poverty Line population. MNREGA also aims to provide employment particularly for marginalised groups encompassing women and Scheduled Caste/Scheduled Tribes (SC/ST) groups. The works permitted under the act focus on contributing to environmental preservation. Works financed by the scheme seek and have to fall under either one of the work schedules or any other work, which may be notified by Central Government in consultation with the State Government. A positive assessment of the environmental effects of the scheme has been made in Karnataka and is currently being rolled out to other states. In the first two-and-a-half years of operation, NREGA generated more than 3.5 billion days of work reaching on average 30 million families per year.
Green Building Movement	With an ever-increasing demand for commercial and residential space, environmental concerns in the building sector have given rise to the green building movement in the country. Green buildings are considered to be resource efficient as they use less water, optimise energy use, conserve natural resources, generate less waste and provide healthier spaces for occupants, as compared to a conventional building. The green building movement in India has witnessed increasing numbers in built space that confirm to two different certification types. 249 buildings have been -certified in line with an international green building called Leadership in Energy and Environmental Design (LEED), which is an internationally accepted benchmark for the design of such buildings. Complementing these efforts Green Rating for Integrated Habitat Assessment (GRIHA) has been developed as the National Rating System of India, conceived by TERI and developed jointly with the Ministry of New and Renewable Energy. It is a green building ‘design evaluation system’, suitable for all kinds of buildings in different climatic zones of the country.
BSE-GREENEX	The Bombay Stock Exchange (BSE) launched the GREENEX index in 2012 to benchmark the carbon footprints of listed companies against each other. The top 20 companies based on estimated greenhouse-gas numbers, free-float market capitalisation and turnover are included. The aim is to create a market-based response mechanism for businesses and investors to use quantitative and objective performance-based signals to assess ‘carbon

	performance'.
Environmental Fiscal Reforms (EFR)	The government has implemented a programme on fiscal reforms to free up economic resources and/or generate revenues while helping to reach environmental goals. Using a number of fiscal instruments like cutting subsidies, levying taxes and duties, providing economic incentives to correct market failure in the management of natural resources and the control of pollution, EFR can reduce abatement expenditure of negative environmental impacts. EFR can address key concerns arising out of environment degradation that may threaten economic and health conditions of the poor, particularly in developing and least developed countries, improving resource efficiency of key economic activities, including sustainable use of natural resources. In this context a focus on effective phasing out of fossil fuel subsidies gains importance.
Private sector engagement	A selection of Indian conglomerates have adopted new business models designed to demonstrate and develop their competiveness and sustainable business practices in order to better meet the challenges of the 21st century. One such example is ITC, an Indian conglomerate; it has established a Social and Farm Forestry Programme, which covers a total area of 90,681 hectares. The programme claims to have provided 40 million person-days of employment among the disadvantaged, particularly tribal and marginal farmers. Effectively feeding a social and environmental dimension to its business case, ITC has planted 365 million saplings to provide pulpwood for ITC's paper mills.

4 Green growth in China

4.1 Growth, poverty reduction and environmental protection in China

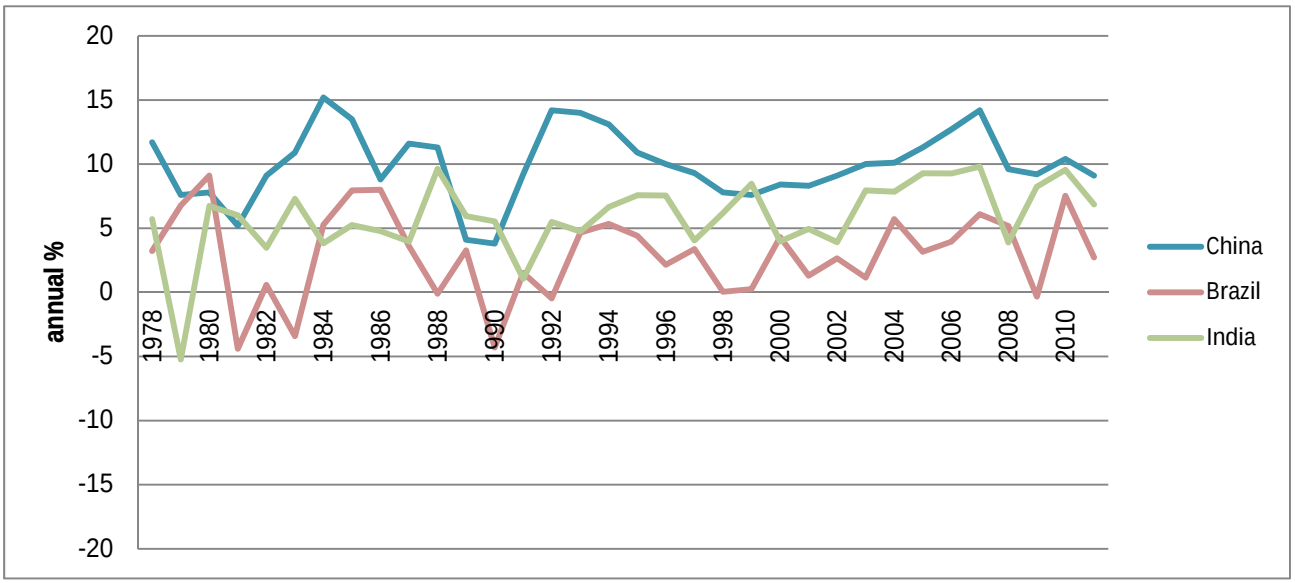
The current status of economic development, environmental protection and poverty reduction in China

Economic development

The basic shape of China's recent economic development is now well documented. In the more than 30 years since the beginning of its reform and opening-up period in 1978, the country has achieved economic growth and transformation on an unprecedented scale, combining high rates of growth and rapid, if incomplete, industrialisation.

In 1978, China's GDP was just US$157.72 billion, a figure that reached US$3.54 trillion in 2011 (constant 2000 US$) (WDI, 2012). A simple average of growth rates during that period gives a rate of 9.69%, substantially higher than both the global growth rate and the rates of other major developing countries (Figure 6) (WDI, 2012). In 2010, China overtook Japan to become the second largest economy in the world.

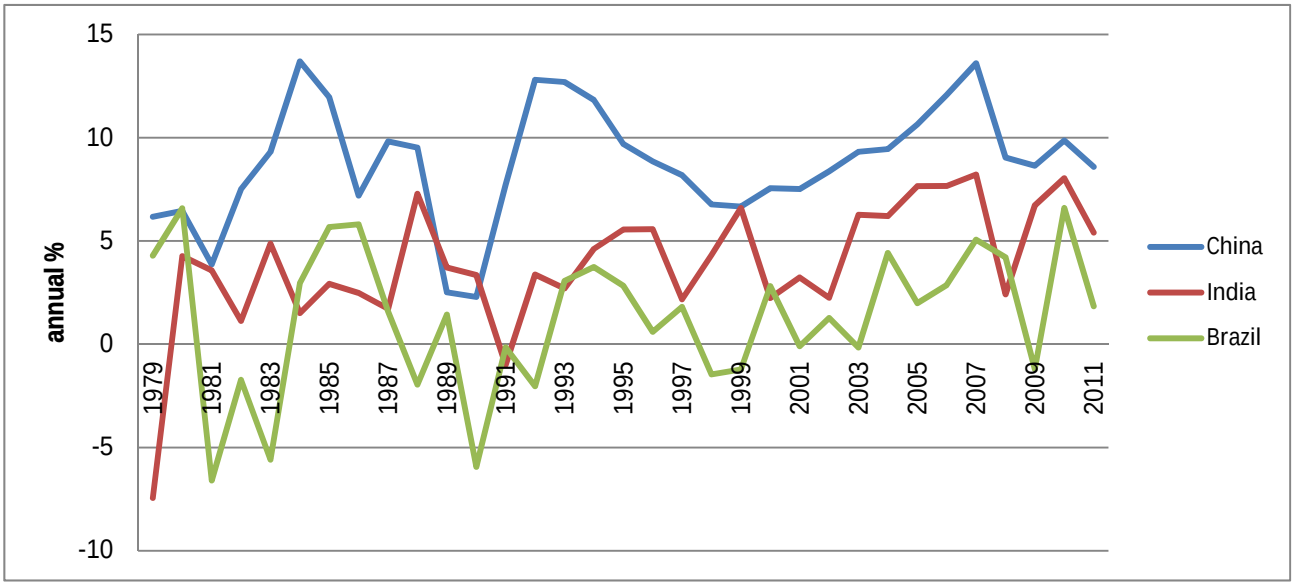
Figure 5: Selected countries' GDP growth rate, 1978-2011



Source: WDI (2012).

Per capita growth rates has been similarly impressive (Figure 7), with per capita GDP increasing from US$164.95 in 1978, and then jumping to US$2,634.71 by 2011 (constant 2000 US$), a simple average growth rate of 8.8% per year (WDI, 2012). In 2011, China's per capita GDP stood at US$5,429.61 (current US$), placing the country in the World Bank's middle-income country classification (WDI, 2012).

Figure 6: Selected countries' GDP per capita growth rate, 1979-2011



Source: WDI (2012).

However, despite rapid growth, China remains at the primary stage of a socialist market economy, featuring reliance on high-volume, low-value-added manufacturing; relatively low levels of scientific and technological innovation; and an environment heavily contaminated by high-polluting and resource-intensive businesses. Against the backdrop of ongoing industrialisation and urbanisation, many of the environmental and social problems that emerged only slowly in today's developed countries have manifested themselves in China in a scope and concentrated timeframe that are also historically unprecedented.

The question of how to balance economic growth and environmental protection, and in doing so to maximise the benefits of the poor in the growth process, is among the most significant challenges currently faced by the country. Its attempts to overcome this challenge are further complicated by contextual features including the ongoing impacts of economic crisis, increasing employment pressures, widening urban-rural gaps, global climate change concerns and other uncertainties.

The unsustainable nature of the current model of economic development has become increasingly apparent, and since the inception of the 11th Five-Year Plan period (2006-2010), the Chinese government has been advocating approaches to economic development that prioritise economic restructuring and transformation.

Environmental protection

During the 11th Five-Year Plan period, the country made a number of notable achievements in terms of environmental protection. In 2008, China's Ministry of Environmental Protection (MEP) was established, marking a change from an approach to environmental protection that depended largely on scattered administrative measures put in place within and across various government ministries, to a more comprehensive approach. This move also appears to reflect an increased level of attention at the highest levels of government to environmental concerns.

Over the same period, government financial inputs into environmental protection increased significantly. In 2009, the State invested 452.5 billion RMB in environmental control and improvement, up 89.5% from 2005; the ratio of investments to GDP increased from 1.30% in 2005 to 1.33% in 2009 (MEP, 2011a). In the same year, a total of 251.2 billion RMB was spent on urban environmental infrastructure, an increase of 94.8% compared to 2005 (MEP, 2011a). Standardisation of environmental monitoring stations in more than half of the nation's counties and districts was completed, and investments in additional environmental monitoring, including an automatic network monitoring pollution sources, were initiated. Environmental issues were

also incorporated into development objectives, with the reduction in total emissions of major pollutants included as a binding target for economic and social development.

Despite these recent actions, environmental deterioration has not been fundamentally contained. The MEP's 12th Five-Year Plan suggests environmental protection legislation remains deficient, inputs insufficient, enforcement power weak, and supervision capacity relatively backward (MEP, 2011b). The nation continues to face a wide variety of environmental challenges. A brief summary of key issues noted in the literature include[10]

- High levels of pollution in key watersheds and bodies of water;
- Severe atmospheric pollution of some regions and cities, with emissions of major pollutants in many regions continuing to exceed environmental capacity;
- Problems related to heavy metal, chemicals and persistent organic pollutants ;
- Oil and underground water contamination;
- Serious ecological damage in some regions, resulting in degraded ecosystem function and vulnerable ecological environment;
- Global environmental pressures such as biodiversity protection.

In short, pressures on the environment, including a growing population, advancing industrialisation and urbanisation, suggest increasing energy consumption and generation of pollutants have both become important factors threatening human health, public security and social stability, and have the potential to act as environmental constraints on economic growth (MEP, 2011b).

Poverty Reduction

Since the inception of the reform era, economic growth has lifted many Chinese people out of poverty. According to the official poverty line, the number of Chinese poor was reduced to just 26.88 million in 2010 from 250 million in 1978 (Information Office of the State Council, 2011), making China the first country to reach the UN Millennium Development Goal of halving its poverty rate.[11] Progress was particularly impressive in rural areas, where the ratio of the rural poor to the total rural population was reduced from 30.7% to 2.8% (Information Office of the State Council, 2011). In 2011, in light of development needs, the Chinese government raised the poverty line in terms of average annual per capita net income from 1,196 RMB in 2009 to 2,300 RMB in 2011 (constant prices in 2010), thus expanding coverage of poverty-relief programmes based on the official poverty line to 122 million recipients (NDRC, 2012).

Alongside increases in income, the national social security system targeting poor populations has also been improving. Systems for pension support, health care, unemployment insurance and protection from the impact of work-related injuries as well as maternity coverage have developed and expanded to provide coverage for most of the urban population. In rural areas, pilot projects of the new rural social pension insurance scheme were launched in 2009 and have expanded the original financing channels of rural pension insurance. The new schemes have gained more fiscal support from the central and local governments, enabling a greater proportion of the target population (poor elderly people living in rural areas) to share in the benefits of national economic growth.

Pilot projects of the 'new rural cooperative health care' system were initiated in 2003 and have expanded to provide coverage for the vast majority of rural residents nationwide. Up to the

[10] A full review of the current state of the environment in China is well beyond the scope of this review. For more information, see World Bank, 2011.

[11] While less austere international poverty lines unsurprisingly indicate a larger number of poor, they indicate a no less impressive reduction over time.

end of 2010, 93.3% rural households in key counties of the national development-oriented poverty alleviation plan have participated in such projects (NBS, 2011a). Primary health-care coverage has been achieved in rural areas through the formation of a three-tier health-care service network involving county-level health-care facilities, township hospitals and village clinics. As an effective supplement to public health care, numerous public-benefit and international organisations have made significant contributions to the reduction of endemic disease, maternal mortality and the mortality rates for infants and children under five in impoverished areas.

With respect to the focus of this paper, it is worth noting that despite the Government's remarkable achievements in providing basic health-care services and medical care for the poor in recent years, there remain serious concerns regarding environmentally related health problems in poverty-stricken areas. Notable concerns include the impact of air and water pollution (including, for example, heavy-metal contamination of agriculture), which has the potential to cause great damage to the health and property of poor people, especially members of already vulnerable groups like the elderly, women and children.

The geopolitical characteristics of poverty are increasingly clear. After 16 years of large-scale and organized development-oriented poverty alleviation, China's poor populations are mostly concentrated in central and western regions, living in rocky and extremely cold mountainous areas; deserts, both arid and semi-arid; and areas with other adverse natural conditions and a fragile ecological environment. In 2011 the State identified 14 destitute areas that lie in contiguous stretches, areas that can be divided into three categories according to their potential for ecosystem services and the status of the local ecosystem: First, remote and isolated poor areas with rich ecological services, such as regions inhabited by minorities in Sichuan and Yunnan; second, areas with rich ecological services but a fragile ecology, such as central Inner Mongolia; third, areas with inadequate ecological services and a gravely degraded ecosystem, such as Loess Plateau (Jin, 2011).

The developmental stages of green growth in China

In this section, we put the development of thinking about green growth in China in historical perspective and shed some light on the interaction between three areas of consideration.

Phase 1 (1978-1992): Economic revival, poverty reduction, and environmental deterioration

In 1978, as China began its reform and opening up, the household contract responsibility system replaced the collective management system of the people's commune period in rural areas. As a result, ordinary rural households could use means of production (e.g. land) that could previously only be used collectively, and could make their own decisions on planting and management. This significant change in production and allocation practices is credited with motivating farmers' enthusiasm for production and improved unit output of land. Subsequent reforms, including changes in farm produce pricing, the marketisation of township enterprises, and the introduction of rural finance and labour markets, further empowered farmers. Factors of agricultural production flowed increasingly freely, and rural China was rejuvenated.

In this period, the incomes of rural residents increased sharply. The per capita net income of farmers increased from 160.2 RMB in 1979 to 784 RMB in 1992, an increase of nearly five times (NBS, 2002a). Agricultural production structures were enhanced, and diverse market-oriented planting models replaced the simple model of planting grains that had prevailed prior to reform. Reform was not limited to traditional agriculture, with forestry, animal husbandry and fisheries all enjoying development, though to different degrees and with variations in the institutional arrangements created in these sectors during reform.

Infrastructure and basic services (e.g. health and education) in rural areas also improved. Moreover, the Chinese government established the ad hoc State Council Leading Group Office of Economic Development for Poor Areas, in 1986 (renamed the State Council Leading Group Office of Poverty Alleviation and Development, in 1993), which was responsible for organising, leading and coordinating development-oriented poverty alleviation in poor areas. Since 1986, poor populations have dropped sharply, and poverty headcount was cut from 30.7% in 1978 to 8.8% in 1992 (NBS, 2004).

However, alongside the improvements in material well-being and social development associated with the diversification of management models described above, the prevalence and severity of environmental problems in rural areas began to increase. In the 1980s, township enterprises were expanding rapidly, injecting vitality into rural economic development; however, most were backward in craftsmanship, extensive in management, and short of pollution-treatment equipment (especially water and air pollution), and they wreaked havoc on the rural environment. The vast majority of township enterprises were scattered across rural China, and many were pollution-intensive enterprises (for example, those in paper manufacturing, cement, textile, and food-processing industries) that were either started in or shifted to rural areas.

In urban areas, market reforms also incentivised economic development. Under Deng Xiaoping's ideological guidance of 'allowing some people to get rich first' and 'fording the river by feeling for the stones', reform first started in south-east coastal areas. The establishment of special economic zones like Shenzhen and Zhuhai contributed to increases in foreign direct investment, attracting more and more rural surplus labour to eastern coastal areas, supplementing the demand for labour force in the process of industrialisation and urbanisation.

Gradually, the manufacturing and processing industry became the dominant part of the national economic development pattern. As the reform and opening-up process deepened, the Pearl River Delta growth pole expanded to the Yangtze River Delta, radiating influence on the whole country, not least through demands for labour in the east and the resulting remittance flows back to the centre and west of the country. While bringing about economic benefits, the economic growth pattern also caused damage to the environment. Air, water and soil pollution worsened, with 78% of river stretches passing cities deemed unsuitable as a source of drinking water and 50% of urban underground water contaminated (China Environment Net, 2008).

In response, the early years of the reform period saw an increase in the drafting of environmental protection legislation that would provide the basis for a system of environmental laws and standards better adapted to a market economy. In 1979, The Environmental Protection Law of the People's Republic of China (for Trial Implementation) was promulgated, which put environmental protection onto the legislative track and expedited development of environmental protection. In 1986, Management Regulations of Environmental Protection for Construction Projects was enacted, which further specified pollution treatment for the projects under way. The establishment of the National People's Congress Environmental and Resources Protection Committee lent further momentum to the legislative process, accelerating the development of environmental protection legislation in the 1990s. In 1994, the Guideline for Environmental Impact Assessment was issued, which clarified environmental assessment standards for project construction.

In summary, the decade and a half following the inception of large-scale reforms in 1978 brought about tremendous economic and social change in both rural and urban areas. These reforms promoted economic development and reduced the size of poor rural populations, but tended to promote forms of industrial development associated with environmental deterioration, thus dealing a huge blow to water, land and other natural resources. Except for the development of basic environmental protection legislation in this period, environmental protection and resource management did not keep up with economic progress sufficiently to bring about green growth.

Phase 2 (1992-2000): Industrialised economic development and environmental degradation accelerate; poverty-environment linkages are acknowledged

In 1992, with the 14th Party Congress as the turning point, the emphasis of economic system reform was shifted to the establishment of a 'socialist market economy', signalling the gradual adoption of markets as the organising principle for much of the country's economic activity. As a part of this shift, the State introduced a series of policies fostering and supporting the non-public economy, which brought about a surge in the opening of individual private enterprises, boosting the non-public economy and contributing to further increases in national income. Measured according to Basic Criteria of National People's Moderate Prosperity Living Standards, in 2000, 95.6% of people nationwide were moderately well off, and the living standards of urban and rural residents met the basic criteria of moderate prosperity.

The processes of industrialisation and urbanisation that underpinned this improvement in well-being brought with them significant changes in the use of land and other natural resources. Large quantities of farmland were converted to non-arable land, which, in conjunction with the impacts of environmental pollution and ecological degradation, resulted in continued reductions in the quantity of available farmland resources in rural China. With the development of industry, the demand for energy rose at an accelerated pace. As is the case today, coal constituted the majority of China's energy mix, and while use of coal resources increased from 13.93 million tons of coal exploited in 1979 to just 20.65 million tons in 1992, by 1996 nearly 1 billion tons of coal were being exploited annually (NBS, 2002b; Shanxi Coal, 2002). In Shanxi province alone, 6,250 township coal mines were reported to the State in 1998, 56.3% of which were productive mines (Zhang, 2000). This figure excludes an unknown (though thought to be large) number of illegal small-scale mines, which have tended to use traditional exploitation and processing approaches that damaged surface water, soil and air. Such mines are often important sources of employment and income for nearby impoverished households, but they carry significant livelihood risks due to poor production conditions and frequent accidents.

After 1990, controls on food prices were further loosened, leading to additional increases in farmers' incomes. The per capita net income of rural households jumped from 708.6 RMB in 1991 to 2253.4 RMB in 2000, an average annual increase of 4.8% in real terms (NBS, 2008). Per capita living expenses increased over the same period, from 619.79 RMB in 1991 to 1670.13 RMB in 2000, eroding some of the poverty reduction effect of income gains; however the Engel coefficient (a measure of the proportion of income spent on food) fell from 57.6% in 1992 to 49.1% in 2000 (NBS, 2008).

During this phase of China's reform-era development, the country's poverty reduction efforts began to take new forms. In 1994, on account of changes in the distribution of the poor population, the Seven-Year Program to Help 80 Million People Out of Poverty specified that the State would amass human, material and financial resources, mobilise all sectors of the society, and try to ensure food and clothing availability for all poor rural residents within seven years. This programme was the first development-oriented plan of action to aid the poor with clear objectives, targets, measures and a deadline. By the end of 2000, its objectives had largely been fulfilled, with poor populations reduced to 94.22 million and poverty headcount to 10.2% (Information Office of the State Council, 2011). By the turn of the millennium, the spatial characteristics of the growth process and the policy responses to poverty had resulted in a context in which remaining poor populations were largely concentrated in areas with adverse natural conditions, fragile ecology and weak infrastructure.

The outstanding features of this period with respect to the environment and sustainable development were the continued aggravation of ecological problems associated with the prevailing model of economic development and the expansion of public sector approaches to environmental protection. By the 1990s, policy-makers at the national level had realized the urgency of environmental protection and were increasingly making links between environmental concerns and national development, explicitly pointing out the need for a 'sustainable development path'. The State promulgated key documents, including the *Ten Key Responses to Environment and Development of China* and *China's Agenda 21: White Paper on China's Population, Environment and Development in the 21st Century,* along with other more specific implementation rules, in an attempt to put forward overall sustainable development strategies suited to the realities of population, environment and development. These strategies highlighted areas such as pollution treatment and ecological protection, and they envisioned the gradual enhancement of enforcement. Large-scale clean-up initiatives (e.g. of major river basins) were carried out in conjunction with pollution abatement measures that included shutting down, suspending, and rectifying pollution-intensive enterprises, though pollution treatment was relatively more effective in urban areas than in rural areas. Through projects aimed at controlling desertification and returning cultivated land to forests, ecological degradation was preliminarily contained. In rural areas, integrated management of small watersheds helped to ease problems of soil erosion.

In summary, the period from 1992 to 2000 saw the Chinese economy further develop with industrialisation and urbanisation, leading to increased productive capacity and incomes. Poverty continued to decrease, partly because of targeted interventions that improved well-

being among the rural poor, though the benefits of growth were distributed unevenly across social and spatial groups. Environmental pollution and ecological damage intensified as demands on natural resources increased, though early efforts to control worsening environmental pollution did see some success, with emissions of some major pollutants decreasing in key areas.

Phase 3 (2000-Present): Integrating economic development, environmental protection and poverty reduction

Since 2000, China has made enormous achievements in environmental protection. At the end of 2001, China entered the World Trade Organisation, which provided a new driving force for economic development. Average annual GDP growth rates hit 10% between 2001 and 2008. Despite the slowdown caused by the global financial crisis in 2008, the growth rate remained around 9-10%, though that figure fell to under 8% in the first two quarters of 2012 as the continued weakness of European markets for Chinese exports affected growth figures (New York Times, 2012). Optimism regarding levels of growth since 2000 has been tempered somewhat by concerns regarding the distribution of that growth.[12]

In this period, the phenomena of uncoordinated regional development, urban-rural income inequality and widening income gaps caused by unequal economic growth have become more evident (NBS, 2011b). While official data on China's Gini coefficient are scarce, media reports suggest the figure crossed the 0.40 international warning line sometime around 2000, with estimates for current coefficients ranging from 0.438 to as high as 0.46 or 0.47 (Wall Street Journal, 2012; Bloomberg, 2012; China Daily, 2010), indicating a relatively large income gap. Reports suggest that while 2011 and 2010 both saw slight decreases in the income ratio between urban and rural residents relative to the previous year, the 2011 figure (the latest available) remains fairly high at 3.13:1 (NBS, 2012). Currently, there is no authoritative data on the income ratio between city dwellers and residents of designated poor areas. In a bid to ease the widening income gap, the State has introduced a series of policies to balance regional development, including the Western Development Strategy, the Rise of Central China Plan, and the Rejuvenation Strategy for Northeast China's Rust-belt Industrial Bases.

In order to better coordinate urban and rural development and increase farmers' income, the Government has placed three rural issues, the *san nong* – agriculture (*nongye*), the countryside (*nongcun*) and farmers (*nongmin*) – high on its agenda. Since 2004, the Government's 'No.1 document' has highlighted this set of issues, and numerous preferential policies for farmers have been adopted. The Government has cancelled taxes on animal husbandry, hog slaughtering, agricultural specialties and forestry. Direct subsidies have been provided to grain growers, along with improved crop strains, agricultural machinery and tools, and other means of agricultural production. As described above, a more effective rural social security network has been gradually established and improved. Infrastructure construction supporting expanded access to clean drinking water, electricity, roads and methane as well as the renovation of dilapidated rural houses has been carried out by the State. While much of the social spending remains the responsibility of local government (see Section 3), fiscal spending by the Central Government on rural-related issues increased from 214.42 billion RMB in 2003 to 857.97 billion RMB in 2010, an average annual increase of 21.9% (Government of Guiyang, 2010).

Since reform and opening up, rural labour has flowed increasingly freely to urban areas, with the number of rural migrant workers increasing from just 2 million in 1983 (Government of Guiyang, 2010) to 252.78 million in 2011 (China Development Gateway, 2012), an increase of over 126 times. This phenomenon has been credited with making a critical contribution to total factor productivity growth in the reform era. Yet, in the period since 2000, as the number of internal migrants has continued to expand, policy challenges related to rural migrant workers have become more acute. In addition to concerns regarding the rights and interests of rural migrant workers themselves, problems caused by those left behind in rural areas are increasingly viewed as serious social concerns (Gong et al. 2008). Women, the elderly and

[12] Here we provide only a selection of descriptive statistics indicating distributional concerns. For further detail and policy implications, see among others Lin, 2008.

children have become key players in rural China, with important implications both for their well-being and for rural agricultural production as some advanced technologies have proven difficult to popularize, leading to some farmland being left uncultivated.

As issues of agriculture, countryside and farmers became the priority of national governance, China's poverty alleviation also reached a new stage. Since the beginning of 2000, the State has issued The Outline for Development-oriented Poverty Reduction for China's Rural Areas (2000-2010) and The Outline for Development-oriented Poverty Reduction for China's Rural Areas (2011-2020), and designated 14 poverty-stricken areas that lie in contiguous stretches as the key battleground for development-oriented poverty reduction during 2010-2020. Since 2000, through special poverty reduction programs, poverty reduction by industries, east-west coordination and targeted assistance programmes, the government has strengthened infrastructure in rural areas, developed industrialized management, guided non-farm employment, gradually enhanced farmers' ability to withstand shocks, and reduced their disorderly and extensive utilisation of natural resources. In the meantime, projects such as Build a New Socialist Countryside, Welfare-to-Work, Grain for Green, Ecological Compensation, and Renewables Popularization have been launched by other agricultural-related government agencies and have also contributed to the improvement of ecosystems and the environment in rural areas.

The State has also relocated impoverished populations from areas with harsh living conditions and natural-resource-poor areas. Some impoverished areas have combined such poverty-relief relocation with the construction of county seats, central towns and industrial parks; the conversion of cultivated land back to forests and grasslands; and migration for ecological purposes and disaster prevention, in an effort to improve public services while promoting the employment of impoverished farmers in urban areas and sectors outside agriculture. Even so, development-oriented poverty reduction in the past still focused on economic development while neglecting ecological protection, pollution treatment and the negative impact of climate change on poverty relief. Therefore, The Outline for Development-oriented Poverty Reduction for China's Rural Areas (2011-2020) underlined the need for ecological protection in poverty-stricken areas to be intensified, environmental pollution controls in rural areas improved, ecological compensation mechanisms favouring poor areas to be established, and biodiversity protection in poor areas emphasized.

After meeting the majority of emission-reduction targets under the 11th Five-Year Plan in 2010, the State made transformation of the economic development model, scientific progress and social harmony the main objectives of development of the 12th Five-Year Plan. In order to meet these objectives, the Government set energy-efficiency and emission-reduction goals, making achievement on these metrics part of the performance evaluation for local governments. MEP now appraises local government performance every year according to the stated emission-reduction goals and should publish the outcomes regularly.

In 2010, China issued its National Development Priority Zones Plan with the aim of identifying the major functions of different geographical areas in light of their carrying capacity of resources and environment, their current development intensity and their growth potential. Based on this assessment, the plan then aims to clarify a contextually appropriate development orientation for the area in question, thus improving development policies and controlling development intensity. With the introduction of a range of management measures like priority development zones, areas that are poverty stricken yet rich in resources cannot continue to rely on resource extraction for economic development. The question of how underdeveloped areas can avoid the pattern of 'treatment after pollution' growth strategies and develop low-carbon, green poverty reduction programs has become one of the key challenges in today's efforts to alleviate poverty.

Given increasing recognition of the interaction between and interdependent nature of these three areas, part of the answer to this question can be seen in Chinese efforts to date. The country has shifted from a conceptualisation of development based simply on increasing farmers' income, to more comprehensive measures aimed at solving a range of economic, social and environmental issues. Since signing the Kyoto Protocol, China has introduced, refined and localised the CDM, green credit, green securities, carbon sink and other advanced international policies, thus unleashing innovative ecological protection mechanisms and

developing green, low-carbon poverty relief strategies in impoverished areas. These mechanisms and others are explored further in the sections that follow.

4.2 The current policy environment

In this section, we provide a typology of the various components of the current policy environment for green growth in China. Given that the final set of policies included in this scoping phase review was necessarily limited, we hope that providing a typology will help to frame future discussions and guide the identification and selection of detailed case studies at the workshop planned for the close of the inception phase.

Umbrella policies: high-level policy guidance and local implementation

This subsection presents an overview of the current high-level policy guidance provided by the Central Government. As described in Section 3, central level policy-making relies in large part on local administrative levels to develop and implement strategies. We focus here on the way in which the policy environment influences economic actors, facilitating them (or not) to achieve green growth.

The 12th Five-Year Plan

China's economic development has been steered by a series of five-year plans (FYP) which began in 1953 and are set out by the Communist Party of China. China is currently in its 12th plan, which will run from 2011 to 2015 and emphasises 'higher quality growth' as well as 'inclusive growth'. The plan sets a number of objectives in regards to green growth within the Chinese economy, and the main binding targets include

- Reducing water consumption per unit of value-added industrial output by 30% by 2015
- Increasing the percentage of non-fossil fuel usage in primary energy consumption from 8.3% in 2010 to 11.4% in 2015. KPMG (2011a), through expert interviews, believes that the Chinese Government may push for an increase (above its binding target) to 15%.
- Decrease energy consumption per unit of GDP by 16% by 2015
- Decrease major greenhouse gas (GHG) emissions by between 8% and 10% by 2015
- Increase the forest coverage rate from 20.36% in 2010 to 21.66% in 2015
- Two new pollution-reduction goals: decreasing both nitrogen oxide and ammonia nitrogen by 10% each

Policy outlines also include the need to promote and develop diversified and clean energy sources within the country and improve the efficiency & effectiveness of current energy production. The 12th FYP goes into detail about a number of sectors of the economy; the following policies are related to green growth:

1 Restructure Key Industries: Key manufacturing industries will be restructured by promoting R&D and increasing the value added of the resulting products (through technological upgrading). Specifically for the transport sector, there is greater emphasis on increasing the energy efficiency of parts being built in-country. For smelting and building materials, also, there is an increased focus on conserving energy during the production process, and there should be reduced negative environmental impacts across all sectors.

2 Incentivise Innovation; in terms of green growth, three sectors are pertinent:

a *Energy conservation and environmental protection industries*: Implement major demonstration projects in energy conservation and environmental protection; promote the industrialisation of efficient energy conservation and of advanced environmental protection and resource recycling techniques.
b *Renewables (including nuclear):* Construct new nuclear power plants; build large wind power generating sets and their components; assemble new and efficient solar power generation and heat utilisation plants; invest in biomass energy conversion and utilisation technologies and intelligent power grid equipment; and implement large-scale marine power, wind power, solar power and biomass energy projects.
c *Renewable energy promotion in the automobile industry:* Conduct R&D and large-scale commercialisation and demonstration projects for plug-in hybrid electric vehicles and pure electric vehicles.

3 *Promote the development of clean energy sources*: Develop hydropower plants respecting ecological conservation, and develop solar, biomass and geothermal energy sources. Coal is used to generate about three-quarters of China's electricity and is likely to remain the dominant fuel for electric power production in the foreseeable future. However, significant and growing amounts of electricity are being generated by natural gas, hydropower and nuclear power:

a *Hydropower* generates a sixth of China's electricity, and hydroelectric capacity could double by 2020 to 170 GW, exploiting 45% of China's hydro potential.
b *Nuclear power* also seems likely to assume an important role, as plans are in place for construction of 25 GW of new nuclear generating capacity by 2020.
c *Natural gas* is being promoted due to its low emissions of atmospheric pollutants and carbon dioxide.

4 *Prioritise Public Transport*: Develop urban public transport systems and increase the proportion of public transport in overall traffic. Develop efficient inter-urban and intra-urban railway networks.

5 *Accelerate the adoption of information technology (IT)* services and the construction of IT infrastructure such as broadband networks in order to create an 'ultra-high speed' data transmission network. Develop e-business and promote e-government.

Strategic emerging industries

The 12th Five-Year Plan lays out seven strategic emerging industries. The Climate Group (2011a) has gathered preliminary data on the Strategic Emerging Industries plans (SEIs) that the Chinese government is formulating, on which the follow discussion is based.

SEIs are being pushed as the strategic sectors of growth for the Chinese economy and follow a three-step road map:

a Industrial value added from all SEIs contributes to 8% of GDP by 2015.
b Industrial value added to contribute 15% of GDP by 2020. High-growth and mature-development-stage SEIs are expected to be 'pillar industries' in the economy. Pre-commercial SEIs are to be leading growth industries.
c SEIs to be 'international leaders' by 2030.

Within the process that China intends to follow in order to stimulate the growth of SEIs, a number of key technologies will be aimed at enhancing low-carbon growth. Table 5 shows the main technologies:

Table 5: Main Strategic Emerging Industries (SEI) technologies

SEI	Low Carbon Technologies	Expected Gross Industry Output	Expected Public & Private Investment
All SEIs	Not applicable	Not applicable	10 trillion RMB over five years
Energy Saving and Environmental Protection	Efficient appliances, efficient motors, waste to heat boilers, ESCOs, recycling	4.8 trillion RMB ($700 billion) per year	Na
New Energy	Nuclear, Hydro, Solar, Thermal, Photovoltaic, Wind, Biomass and Biofuels, Smart Grid, Clean Coal Technologies	15 trillion RMB ($2.3 trillion) up to 2020	All new energy: 5 trillion RMB ($760 billion) by 2020. All renewables: 2-3 trillion RMB ($300 billion - $460 billion) by 2020.
New Energy Vehicles	Electric vehicles (EV) Plug-in hybrids (PHEV) Fuel cell vehicles (FCEV) Energy-efficient vehicles Advanced batteries	New-energy vehicle targets for 2015: 500,000 new-energy vehicles (EV, PHEV and FCEV) on the road (set by MIIT). 1 million new-energy vehicles (EV, PHEV and FCEV) on the road (set by Ministry of Science and Technology (MOST)).	Government funds to be provided by 2015: 50 billion RMB ($7.6 billion) for R&D and industrialisation. 50 billion RMB ($7.6 billion) in subsidies for consumers and infrastructure.
New Materials	LED Lighting	30% annual growth rate from 2008 to 2015; 300 billion RMB ($45 billion) p.a. by 2013 for Guangdong Province alone.	Na
Next Generation ITC Technology	Smart meters Digital virtualisation	Cloud computing technology: market value estimated 60.7 billion RMB ($9 billion) by 2012. ICT: 249 billion RMB ($37 billion) investment for the construction of the IT service system for video content and 439 billion RMB ($67 billion) for IT services and final end-user	Smart Grid: 1 trillion RMB ($150 billion) by 2020; 384.1 billion RMB ($58.48 billion) by State Grid from 2009 to 2020.

		consumption (2011-2013)	

Source: The Climate Group (2011a).

SEIs will also be supported through a number of different policies that are aimed at improving their competitiveness (The Climate Group, 2011a):

Table 6: Policies to support Strategic Emerging Industries (SEIs) in China

Theme	Policy
Innovation & R&D Support	R&D funding for both national engineering laboratories and engineering centres within enterprises under the government's 863 and 973 research programs. The establishment of an industry technology innovation alliance. Provision of a general technology service platform for SMEs with a number of geographic centres. A hi-tech sector platform including R&D, information and entrepreneurship services, as well as a series of technology exchanges.
Commercialisation Support	Pilot programs (similar to those already in place for electric vehicle deployment). Building up infrastructure for electric vehicles and new energy applications.
Demand Side Incentives & Standards	Extending the application of consumer product energy-efficiency labels. End-user subsidies, including direct consumer subsidies, and tax exemptions for enterprises purchasing SEI products. Government preferential procurement policies for SEI products. Enforcing renewable-energy portfolio standards for new energy.
Market Mechanisms	Promotion of new business models (including energy service companies, recycling and re-use of waste products). Reforming renewable energy and resource pricing mechanisms. Accelerating the development of carbon and pollutant trading schemes.
Tax & Fiscal Support	Preferential tax rates for SEI companies, both domestic and foreign, across all SEI sectors. Enhanced fiscal support through the establishment of specific funds. Guidance for financial institutions to establish a loan-management and review system which could support the development of SEIs. A few large-scale commercial banks have already established a task force on expanding loans to SEIs. Promoting innovation in financial services, including provisions for IP hypothecation. Continued development of the equity market, bond market, and VC/PE industries. Extending access to SEIs to private investors.

Source: The Climate Group (2011a).

The Outline for Development-oriented Poverty Reduction for China's Rural Areas (2011-2020)

As explained in Section 2, in 2011 the National Development and Reform Commission (NDRC) and the State Council Leading Group Office on Poverty Reduction and Development (LGOP) created the Outline for Development-oriented Poverty Reduction for China's Rural Areas (2011-2020). This policy document provides national guidelines for rural poverty alleviation in China. Compared with previous poverty reduction strategies, this paper sets more numerous and more detailed targets with respect to environment protection. It points out that the main target for China's rural poverty reduction has shifted from simply ensuring people's economic livelihoods to helping poor people improve their level of well-being more quickly, improving the ecological environment, enhancing developmental capacity and narrowing emerging development gaps. The emphasis on energy and environmental protection has been heighted, with targets set in several areas other than economic achievement; however, other than the requirement that forest acreage in 2020 will be 3.5% more than at the end of 2010, no quantitative metrics for success are provided.

Administrative/regulatory approaches

Environmental impact assessments (EIAs)

The EIA is the main regulatory instrument for environmental protection in China and a requirement for all development projects under the EIA Law 2002. All construction firms are required to obtain approval for environmental impact assessment of their projects before starting construction and, during the construction period, to implement the environmental protection and impact mitigation measures detailed in the assessment. EIAs are regulated by MEP and checks occur on an annual basis.

The effectiveness of pollution monitoring and compliance has, however, been questioned, with the World Bank's recent China 2030 report noting 'environmental regulations remain relatively weak and there has been inconsistent enforcement' (World Bank, 2012: 263). Similarly, Wang and Wang (2012) conclude, 'Ineffective enforcement of environmental and resource laws is endemic in China' (2012: 165).

Permits and fees

Permits and fees include a system of charging fees for pollutant and waste discharge, a discharge permit system (DPS) to limit the quantity and concentration of pollutant discharge, and a tax and subsidy structure geared towards environmental improvements. Implemented in nearly all counties and cities in China by 1996, the system includes discharge fees on major pollutants, urban sewerage, urban solid wastes, and hazardous wastes. Of these collected funds, 80% are returned to enterprises for pollution control investments.

Clean energy quotas

Recent media reports have suggested that China is considering the implementation of a nationwide quota system to incentivise investments in renewable energy. Components of the system could include quotas for renewable energy use as a portion of total electricity consumption, the quantity of electricity acquired by each grid company, and the total number of renewable energy power plants. According to Ren Dongming, director of the Center for Resource Solutions, Centre for Renewable Energy Development, Energy Research Institute, National Development and Reform Commission, implementation could come as early as 2012.

Ecological functional areas

Introduced under the 11th Five-Year Plan, but largely unimplemented, the development of ecological functional areas constitutes an attempt to differentiate developmental priorities in accordance with the ecological characteristics of specific locations. Under the State Council's 2010 *Main Functional Area Development Plan*, all land in China will be categorized as one of four types:

1. relatively affluent, industrial, urbanised areas where development should be 'optimised' to solve existing environmental problems;
2. key areas for future development;
3. areas where development should be limited; and
4. areas where development is prohibited.

The intention is that this centralised initiative will be able to establish more stringent environmental regulations than might otherwise be put in place locally, thus necessitating those regions to follow alternative paths to development (DRC in World Bank, 2012). This strategy was given a prominent position in the 12th Five-Year Plan[13].

Market-based approaches

As noted in the section above, given the weaknesses of administrative approaches to regulating and otherwise incentivising green growth, there has been increasing interest in alternative approaches.

Taxation

One such approach that has generated considerable discussion is the use of fiscal policy to affect pricing in such a way that environmental externalities are internalised at some stage of the supply chain.

China has implemented a resource tax for oil and gas resources, which was initiated in Xinjiang, and then rolled out nationwide from 1 November 2011.. Jointly issued guidance from the Ministry of Finance and the State Administration of Taxation (Decree No. 66 (28 October 2011)) places the provisional rate of the tax for oil and gas resources at 5%, and 'extend[s] the use of the ad valorem method for crude oil and natural gas that previously applied for Xinjiang and the western region of China to all of China, with the tax rate ranging from 5% to 10%' (KPMG, 2011b). The Government has suggested that the price of oil and natural gas will not be affected (People's Daily, 2011), but rather that the adjustment might bring down the profits of oil producers, suggesting a supply-side focus that avoids putting upward pressure on prices faced by consumers (and the consumer price index). Therefore, if there is to be a positive impact on sustainability, it is not likely to be through an incentive mechanism based on changing consumption patterns, but rather through incentivizing alternative energies. It is not clear what the magnitude of this effect might be, or that of poverty reduction effects, as the policy has been viewed by some as a mechanism to return some revenue to cash-strapped local governments (not least in the restive but resource-rich north-west) (Reuters, 2011).

In addition to this tax, which is now in place, policy-makers have debated the implementation of other fiscal instruments that attempt to internalise negative environmental externalities. Following a number of years of preparatory work by, among others, the Research Institute for Fiscal Science at the Ministry of Finance, the Chinese Academy for Environmental Planning, and the Energy Research Institute under NDRC, a number of well-placed sources suggest that a pilot carbon tax initiative is likely to be implemented under the 12th Five-Year Plan. Whilst the level of such a tax would initially be relatively low (the World Resource Institute's Deborah Selighson estimates the tax could be somewhere in the range of 10-20 RMB per ton of CO^2), research suggests that a carbon tax could have significant impact not only on emissions levels but, given its uneven cross-sectoral impact, on industrial transformation more broadly (Wang et al., 2010; Zhou et al., 2011).

Aizawa and Yang (2010) note that discussions have also taken place among MEP, the Ministry of Finance, and the State Administration of Taxation, regarding the potential for an environmental tax system. Discussed during the 2010 *lianghui* (National People's Congress Conference and National Committee of the Chinese People's Political Consultative Conference), the new tax system would reportedly rely on adding an environmental component to existing taxes (He, Han, and An, 2010 in Aizawa and Yang, 2010).

Advocates suggest that the use (and reform) of existing fiscal systems in the implementation of a carbon tax or a broader environmental tax could help to reduce the transaction costs associated with regulatory approaches and potentially bypass the need for an expansion of the bureaucratic apparatus charged with environmental protection (Authors' Interview, Beijing, May, 2012). However, proposals to differentiate the level of the tax across industries,

---

[13] For more detail, see Chapter 19 of the 12th Five Year Plan, available in the English translation at: http://cbi.typepad.com/files/full-translation-5-yr-plan-2011-2015.doc.

products, and pollution levels, whether for goals of progressivity or to fine-tune the cross-sectoral impact, raises important challenges of measurement, reporting and verification (MRV). Some work has been done in this area with respect to MRV as an Element of a Global Climate Change Agreement (e.g. Teng et al., 2009), which would also be highly relevant to the effectiveness of domestic legislation.

Green finance

China has implemented a number of other policy initiatives that attempt to address environmental concerns through market mechanisms.

Green insurance:
The MEP and the China Insurance Regulatory Commission (CIRC) issued a green insurance policy in 2007, which presented a road map for establishing an environmental liability insurance system in China by 2015.

Green securities:
In 2008, the MEP created a green securities policy, which made an environmental audit one of the prerequisites for IPO or refinancing through the securities market by enterprises in thirteen heavily polluting industries and required environmental information disclosure by listed companies.

Green credit:
In 2007 the MEP, the People's Bank of China (PBOC) and the China Banking Regulatory Commission (CBRC) jointly issued a green credit policy aimed at curbing pollution and improving energy-saving and emission-reduction projects. The three main components of the policy include

1 Strengthening commercial banks' management of environmental performance, by ensuring that financial institutions consider environmental performance criteria in lending operations. New projects that fail to meet performance criteria under EIAs (see section 4.2 above) required by law, or indicate that they will be excessively energy intensive or highly polluting, should not be extended credit, whereas projects that demonstrate energy-efficiency and/or emission-reduction potential should be supported. Similar restrictions apply to the provision of working capital to existing enterprises (Aizawa and Yang, 2010).
2 Promoting sharing of environmental information between the relevant environmental authority – namely the local environmental protection bureau (EPB) – and the financial sector. The PBOC and the CBRC will respectively assist in the incorporation of environmental information into existing credit systems and supervise bank practice (Aizawa and Yang, 2010).
3 Establishing responsibilities for violation of the green credit policy. Liability can be imposed on EPBs at both the individual and organisational levels and on banks that grant loans to projects with environmental violations or that are otherwise in violation of the green credit policy (Aizawa and Yang, 2010).

Emissions trading

Emissions trading schemes continue to play an important role in the set of policies and programmes intended to achieve low-carbon development in China under the 11th and 12th FYPs (Table 7). While little is known about the impact of such programmes, we include a brief overview here due to their potentially significant role in green economy approaches.

Initial efforts to establish domestic carbon market mechanisms began with voluntary initiatives, including the establishment of the Panda Standard in 2009 and the China Green Carbon Foundation (CGCF) scheme in 2010. Limited in their reach by regulatory uncertainties and the lack of voluntary demand, these mechanisms have largely served as lesson learning exercises regarding the involvement of local experts, the collection of data, and the development of the market infrastructure necessary to support early demonstration activities (Kossoy and Guigon, 2012).

Government interest in emissions trading has largely taken the form of support for a series of Pilot Emissions Trading Schemes (ETS) in five cities (Beijing, Tianjin, Shanghai, Chongqing,

and Shenzhen) and two provinces (Guangdong and Hubei). Coming on the back of the July 2010 launch of a broader programme of 'Low-carbon Pilot Development Zones' in five provinces and eight cities, which 'called on local authorities to implement measurement and reporting of GHG emissions data and to establish low-carbon development plans. In addition, authorities were encouraged to explore complementary policies, including market mechanisms' (Kossoy and Guigon, 2012). Led by the NDRC's Department of Climate Change, the Pilot ETS appear to be intended to be functioning by 2013 in order to support the subsequent development of a national ETS prior to the end of the 12th Five-Year Plan in 2015 (NRDC in Kossoy and Guigon, 2012).

Table 7: Emissions trading in China, 11th and 12th five-year plans

		11th FYP (2006-2010)			12th FYP (2011-2015)		
Global goals	Key indicators	2010 targets (from 2005 levels)	Results	Supporting tools and measures	2015 targets (from 2010 levels)	Additional supporting tools and measures	Existing pilot market initiatives
Decreasing emissions of carbon and other pollutants with energy conservation and clean energy	Energy consumption intensity	20%	19.06% (-630 million tce, -1.46 billion tCO2e)	Elimination of backward production capacity. 'Ten Key Energy Conservation Projects'. 'Top-1000 Enterprises Energy-Consuming Enterprises Program'. 'Energy-efficient products for the benefit of people'. Installation of flue-gas desulphurisation systems on coal plants -Energy Management Companies (ESCOs) 355.	8.7 tce/thousand RMB from 10.3 (-16%)	Market mechanisms : Voluntary market Pilot ETS Low-carbon city plans Energy Management Companies (ESCOs) Existing initiatives are maintained or expanded in scope (e.g., Top 1000 to 10,000 Enterprises), higher standards are set	Pilot energy-efficiency scheme in Tianjin Municipality SO 2 trading in Jiangsu
	Emissions of major pollutants	10% SO 2 (15.49 from 22.95 million tons) -10% COD (12.73 from 14.14 million tons)	14.29% SO 2 12.45% COD		-8% SO 2 -8% COD -10% NOX -10% NH3		
	CO2 emission intensity	New to 12th FYP			17%		
	Share of non-fossil fuels in primary energy consumption	Up at 10% from 7.5%	8.3% (up 3.1%)	Feed-in tariffs. Indicative tariffs. 'Mandated market share' (similar to Renewable Portfolio Standard).	No official target to date	Continuation of the same supporting measures (higher standards)	None

Increasing carbon sequestration	Forest cover	Up to 20% from 18.2%	20.36% (+25.29 million ha)	Afforestation programs Forest Conservation Restoration of desertified lands	21.66% (+12.5 million ha)	Continuation of the same supporting measures	Panda standard (AFOLU offset certification scheme). China Green Carbon Fund by the State Forestry Administration.
	Forest stock	New to 12th FYP			14.3 from 13.7 billion m^3		

Government transfer payments: compensation, subsidies and procurement

Ecological compensation mechanisms:

The government has invested significantly in ecological compensation mechanisms designed to compensate households for the provision of ecosystem services (also referred to as environmental services). There is extensive literature on these issues, covering programmes operating in a number of different areas of environmental protection, including watershed-related programmes, forest-related programmes, soil conservation programmes, and erosion prevention programmes and eco-agricultural programmes.

Table 8: Ecological compensation mechanisms, 2008

Target	Programme/Policy	Size
Water Quality and Quantity	Watershed Eco-compensation Programs	Total budget of 14.6+ billion RMB, 703+ million RMB already spent, plus annual payments of 288+ million RMB.
	Water Use Rights Transfers	Total estimated project costs of 2.777 billion RMB, 1.149+ billion RMB invested so far.
Forest-related	Conversion of Cropland to Forests and Grassland Program (CCFG)	Total budget of 337 billion RMB (of which 130.1 billion RMB has been spent during 2000-2006). 139 million mu (9.27 million ha) of cropland enrolled and 205 million mu (13.67 million ha) of wasteland afforested.
	Central Government Forest Ecosystem Compensation Fund (FECF)	A total of 1.578 billion mu (105.2 million ha) of national-level key public benefit forest area enrolled by the end of 2007. Cumulative total investment of 13.34 billion RMB by the end of 2007 (3.34 billion RMB in 2007 alone).
	Provincial-Level FECF (complementary to central government FECF)	Apart from national key public benefit forest area, 1.15 billion mu (76.7 million ha) of provincial-level public benefit forest area enrolled by the end of 2007. Subsidies of 1.2 billion RMB in 2006.
	Natural Forest Protection Program	Total targeted forest area of 1.023 billion mu (68.2 million ha), of which 846 million mu (56.4 million ha) is designated as natural

		forest area. Total budget for 2000-2010 is 96.2 billion RMB, of which the central government will provide 78.4 billion RMB.
	'Three-Norths' Shelterbelt Program	Completed afforesting 367 million mu (24.47 million ha), and is controlling desertification on over 450 million mu (30 million ha) and soil erosion on 300 million mu (20 million ha) of land. Total estimated budget for the current period of the programme (2001-2010) is 35 billion RMB, of which 25 billion RMB will be from the central government.
	Beijing-Tianjin Sandstorm Source Control Program	Total programme budget is 50 billion RMB, of which Beijing is to invest 3.9 billion RMB. By the end of 2007, 47 million mu (3.13 million ha) of land has been afforested, and total expenditures have been 19.9 billion RMB.
	Forest Vegetation Restoration Fee	8.044 billion RMB during 2003-2005.
Soil Erosion	'Four Wastelands' policy	Size of the programme is likely to be huge both in terms of land area and revenue generated for local governments and participating farmers, and in terms of imputed labour costs of soil erosion prevention.
	Soil Erosion Control Fees and Soil and Water Conservation Installation Compensation Payments	No available information, though likely huge in terms of revenue generated and land area involved, since this policy encompasses all of China.
	Yangtze River Upper Watershed Water and Soil Conservation and Key Prevention Program	As of 2004, more than 15.929 billion RMB spent for management of soil erosion on over 8 million ha.
Eco-agricultural	National Green and Organic Foods Certification System	Large and growing, though exact numbers are not readily available.
	Dalian City, Liaoning Province, Green Agriculture Support Subsidy	Numbers on the program's total budget, or the number of farmers that have benefited from these subsidies, are not available.
	Shanghai Organic Fertilizer Subsidy	Size of the programme has expanded from use of 15,000 tons of organic fertilizer on 100,000 mu (6,667 ha) in 2004, to 120,000 tons of organic fertilizer on 600,000 mu (40,000 ha) in 2006. From 2004-2006, total of 56.25 million RMB in subsidies spent.
	Beijing Organic Fertilizer and Safe Pesticide Subsidies	20 million RMB invested in 2007 for subsidising the use of 75,000 tons of organic fertilizer used on 200,000 mu (13,333 ha) of grain fields in 13 counties in Beijing.

	National VAT Tax Exemption for Organic Fertilizer Use	Numbers on the size of total tax exemptions unavailable.
	Rural Biogas Development	Central government investments of 12+ billion RMB from 2003 through 2008. Provincial and local government investments of 1.5 billion RMB in 2006 alone. Program activities during 2004 through 2008 encompassed counties and 98,600 villages, with 10 provinces issuing complementary policies. A cumulative total of 26.23 million household biogas stoves installed by the end of 2007. The programme aims to have a total of 40 million household stoves installed by the end of 2010.
	Promoting Conservation Tillage	Central government investment of 170 million RMB from 2002 through 2007, with matching local government investments of 1.78 billion RMB. Enrolment of 30.62 million mu (2.04 million ha) of conservation tillage area, and almost 100 million mu (6.67 million ha) of no-tillage area. Project encompasses 15 northern provinces.

Source: Bennett (2009).

While there is variation in the detail of the compensation mechanisms currently in place, interviews suggest there are some questions as to the strength of the incentive effects of levels of compensation in such programmes. For example, recent documentation suggests investments of 365 billion RMB (US$55 billion) have been made on afforestation programs, 'providing cash payments and other incentives for farmers to engage in such activities as restoring marginal lands in fragile watersheds, planting shelterbelts to protect against sandstorms, and protecting natural forests' (World Bank, 2012: 263-4). Interviews suggest compensation levels may be too low to prevent forest owners from continuing logging practices, which raises important questions about the poverty reduction potential of such policies. For example, the compensation rate for national ecological forest is 10.00 RMB/year/mu[14], of which, apart from a 2.25 RMB/year/mu administration fee, the 7.75 RMB/year/mu is given to the farmer (Author's interview, Guizhou, June 2012). This constitutes a limited contribution to attempts of raise household incomes, and in practice it may not provide a sufficient incentive for people to stop damaging the environment, or make a significant contribution to inclusive growth. This, however, is an empirical question that deserves investigation.

Resource rights:
While a complete review of property rights is beyond the scope of this initial review, interviews suggest that (partial) ownership rights have played an important role in determining the extent to which rural residents have benefitted economically from environmental legislation. Reforms introduced in 2009, which extended the contract period for household forest rights to 70 years and allowed households to mortgage their rights, strengthened the incentive for rural people to invest in sustaining forests. Up to 2012, demarcation has been completed for 2.6 billion mu out of a total of 2.7 billion mu of state owned forests. The full registration project has been completed for 2.265 billion mu, with 83.97 million farmers obtaining new registration forms (PRC, 2012).

[14] Note, 1 mu is equivalent to 666 2⁄3 m², ~797.3 square yards, or ~0.1647 acres

Subsidies:
To expand the usage of various forms of clean energy and green industry, the State has provided subsidies. While some forms of environmentally oriented financial support have historical roots dating back several decades (e.g. subsidies for agricultural water saving programmes (which aim at building irrigation systems) have been funded since 1996), China's subsidy system has been built up substantially since 2000.

Table 9: Selected green subsidies

Green vehicles	Government promotion of green vehicles has included the use of subsidies for 71 hybrid, electric and fuel-efficient models made by 16 different firms, including BYD, Hyundai Motors' Chinese venture, Shanghai General Motors Company, and the Changan-Ford-Mazda joint venture. The subsidy scheme provides 3,000 RMB ($441) per fuel-efficient vehicle (only vehicles with engines no bigger than 1.6 litres). The 2010 national scheme has in some cases been complemented by city-level pilot schemes promising 'subsidies worth up to 50,000 RMB ($7,400) for plug-in hybrids and up to 60,000 RMB ($8,800) off the purchase price of full electric vehicles' (Business Green, 2010).
Biofuels	Biogas subsidies have been provided in some form since 2003, including support to farmers as detailed in the section on ecological compensation above. In 2007, new flexible subsidies were made available to biofuels producers. As described by Campbell (2010 12: 'Farmers were authorized a subsidy of $405 for each hectare of forest used for biofuels production, and a subsidy of $365 for each hectare growing biofuel crops. China controls transportation fuel prices, and sets the price of ethanol at approximately 91% of the price of gasoline. The five licensed producers of ethanol in China are eligible for support in the form of direct output-linked subsidies, tax exemptions and low-interest loans, and they are the beneficiaries of mandatory blending programs for ethanol with gasoline in ten provinces. Contrary to the highly controlled ethanol industry, the biodiesel industry is dominated by small scale producers who use waste cooking oil and animal fats as feedstock. Producers sell biodiesel direct to users without taxation or direct fuel subsidies. Total support for ethanol and biodiesel is expected to rise to $1.2 billion by 2020, excluding the subsidy support to farmers mentioned earlier.'
Renewable energy	Fees used to subsidize renewable energy were increased from 0.014 cents per kwh to 0.029 cents per kwh in 2007 and are charged to all electricity users in China. Fees for industrial users doubled in 2009 and now constitute 0.8% of their electricity bill (Campbell, 2011). 'The fee goes to the companies which operate the electricity grid and must buy the renewable power from project developers' (Campbell, 2010: 11).
Solar	Campbell (2011) notes solar power projects benefit from an investment subsidy of 50% under the central government's Golden Sun program. Additionally, feed-in tariffs for the solar industry announced in August 2011 provide a degree of stability for potential investors. Adding a significant domestic component to the demand for Chinese solar infrastructure could prove critical for the industry, given weakening demand from Europe in the wake of fiscal considerations and the associated end of subsidy regimes abroad. Potential economic and poverty reduction impacts are likely with respect to both production and installation of relevant energy infrastructure (New York Times, 2011).

R&D

Under the direction of the Ministry of Science and Technology, China has established a series of programs promoting R&D in areas relating to green growth. The three main reform-era initiatives include

1 The Key Technology R&D Program. 'Initiated in 1982 to address major science and technology issues in economic and social development, this was China's first national R&D program supporting innovation for environmental pollution control and efficient resource utilization for energy and water. Almost $1 billion was invested between 2001 and 2005' (Campbell, 2011).
2 The 863 Program[15], also known as the National High-Tech Development Plan. 'The program focuses on boosting innovation in strategic high technology sectors so that China can gain a foothold in world markets. Its initial objective was to make China independent of financial obligations for foreign technologies, and to diversify research efforts away from purely military themes to civilian and dual-use technologies such as satellites, computers, robotics, biotechnology, and energy and space exploration. The program invested $3 billion in research from 2001 to 2005' (Campbell, 2011).
3 The 973 Program, also known as The National Basic Research Program. Aimed at strengthening basic research (as a complement to the 863 Program) and founded by the National Science and Technology Committee, the 973 Program has funded 382 projects between 1998 and 2008, with a total investment of $1.3 billion (Campbell, 2011).

An additional $585 million was approved in 2008 jointly for the 863 and 973 R&D programmes (Campbell, 2011).

Green procurement

Given the size of government expenditure in China, government purchases of goods and services from outside bodies have been an important tool in the Government's policy toolbox.[16] Since the promulgation of the Government Procurement Law in 2002, the State has increasingly codified regulations covering procurement, with government actors at both the national and local level increasingly adopting green procurement practices (e.g. setting environmental requirements for each category of procurement and giving priority to the purchase of products with environmentally friendly labels (Aizawa and Yang, 2010). Qiao and Wang (2011) denote three stages of development of green procurement in China (Table 10).

[15] Chinese government programmes are occasionally known by numbers indicating the timing of their creation. In this case, the 863 Programme was created in March of 1986, thus named 863. The 973 programme is similarly named.

[16] 'Some key infrastructure projects on-going in China arguably reflect the real size of China's public procurement market: the planned expenditure of the project channelling water from Yangtze River to Yellow River is US$59 billion; the budget to lay seven thousand kilometres of new railway tracks is US$42 billion; the spending for Beijing 2008 Olympic Games is US$34 billion' (Lague, D., 2003:25 in Wang and Zhang, 2010: 3).

Table 10: Phases of green public procurement and relevant legislation

Phase	Policies / laws
Embryonic stage (1993-2003)	• Government Procurement Law • Clean Production Law of the People's Republic of China
Promotion of green public procurement in response to the concept of scientific development (2004-2007)	• Notification on Resource-saving Activities by the State Council Office • Opinions of Implementing Government Procurement of Energy-saving Products • Decision on Carrying Out Scientific Development Concept by Strengthening Environment Protection of 2005 • Opinions on Implementation of Government Procurement for Environmental Labelling Products of 2006
Comprehensive development stage (2007—present)	Effective 1 January 2007 central and provincial government departments must comply with all procurement requirements, including • National Environment Protection in 11th Five-Year Plan • Energy Saving and Expulsion Reducing Scheme and Energy Saving Law • Circular Economy Promotion Law • Public Organs' Energy Saving Regulations (2008) • State Council Office Notice on Forcefully Establishing Government Procurement System for Energy Saving Products • Notification on Public Purchasing List of Adjusting Environmental Labelling Products From 1 January 2008 government actors at all levels are regulated by this policy

Source: Qiao and Wang (2011).

Information-based approaches

The third form of policy and programmatic intervention designed to support various elements of a green economy are information-based approaches. These approaches are intended to resolve signalling and information asymmetries that contribute to environmentally destructive market failures. Underpinning these approaches is the assumption that better-educated consumers (whether they are end users of goods and services or consumers of intermediate goods somewhere along the supply chain) are willing and able to provide incentives for greener more inclusive forms of growth by demanding goods and services from 'responsible' producers. Such initiatives can be instigated by governments, NGOs or businesses themselves. Several initiatives of this type are currently underway in China, a number of which are detailed below.

Measurement, standards and certification

Several international organisations have worked with domestic partners to develop and implement certification standards for environmental criteria (e.g. levels of greenhouse gas emissions). Initiatives identified during the scoping phase include the recent (November 2011) launch of the Corporate Value Chain (Scope 3) and Product Life Cycle Standards in China by Greenhouse Gas Protocol. These standards were co-developed by the World Business Council for Sustainable Development and the World Resources Institute, with eight Chinese firms

involved in road testing.[17] The standards are intended to provide better information to businesses about the climate impacts across the value chain and thereby to identify opportunities to improve efficiency.

Recognition and 'green' branding (industry-led)

Driven by the reputational incentives faced by businesses, some economic actors have made moves to develop a positive image or association with green practices. One such initiative, the Top-100 Green Companies list, produced by the China Entrepreneurs Club, provides an annual list of companies, including State-owned enterprises (SOEs), joint ventures and international firms that are recognised for environmentally friendly practices and which, in theory, should serve as an example for other companies within China. Interviews suggest that industry-led initiatives of this type are often greeted with scepticism, though little impact analysis has been carried out. This case study is of particular interest in order to assess whether the sustainability efforts of these major companies propagates further down the supply chain into the smaller companies within their supply chain. A study of the supply chains for the top companies in the list could highlight the propagation mechanisms (or lack thereof) of sustainability practices in major companies.

The China Greentech Initiative (CGI) aims to improve Chinese companies' position in the green technology market. The platform revolves around cooperation between multiple private sector representatives and aims to improve China's position in the global green technologies market; Chinese firms are already major players in the photovoltaics segment. The CGI uses expertise across 100 companies to formulate market strategies, with the 2012 plan looking at five key areas: 'next generation energy value chain; energy, water and waste in the built environment; electric vehicles; low carbon zones; and sustainability'[18]. These plans have a dual aim: to promote the achievement of Chinese environmental targets by 2015 and to provide greater commercial opportunities for the CGI partner members.

Monitoring programmes (non-industry-led)

In complement to industry-led initiatives to publicise and take credit for performance against environmental criteria, there are also several external monitoring and information dissemination programmes intended to provide better information regarding environmental performance of businesses. In some cases, standards and measurements initiatives of the type described above have been linked to certification programmes designed to provide independently verified public recognition of a firm's improved environmental practices. Examples include collaboration between the Carbon Trust and CTI International Certification Company, an independent certification body based in Shenzhen, China, to audit and certify Chinese businesses to the Carbon Trust Standard.

However, there is a broader push for improved monitoring of environmental performance of businesses and the dissemination of such information. Internationally supported programmes include the European Union Program on Environmental Information Transparency. Domestic initiatives include the Green Choice Alliance, designed and implemented by the Institute of Public & Environmental Affairs, a Beijing-based NGO.

[17] The eight firms are Baosteel Group Corporation, Lenovo China, Quanta Computer, PricewaterhouseCoopers China, Swire Beverages, Lianye Garment-making (Dongguan) Co., Ltd, Shanghai Zidan Printing Co., Ltd, and KunshanTaiying Painting Co., Ltd.

[18] http://www.china-greentech.com/about

Box 1: China's Top-1000 Energy-Consuming Enterprises Program

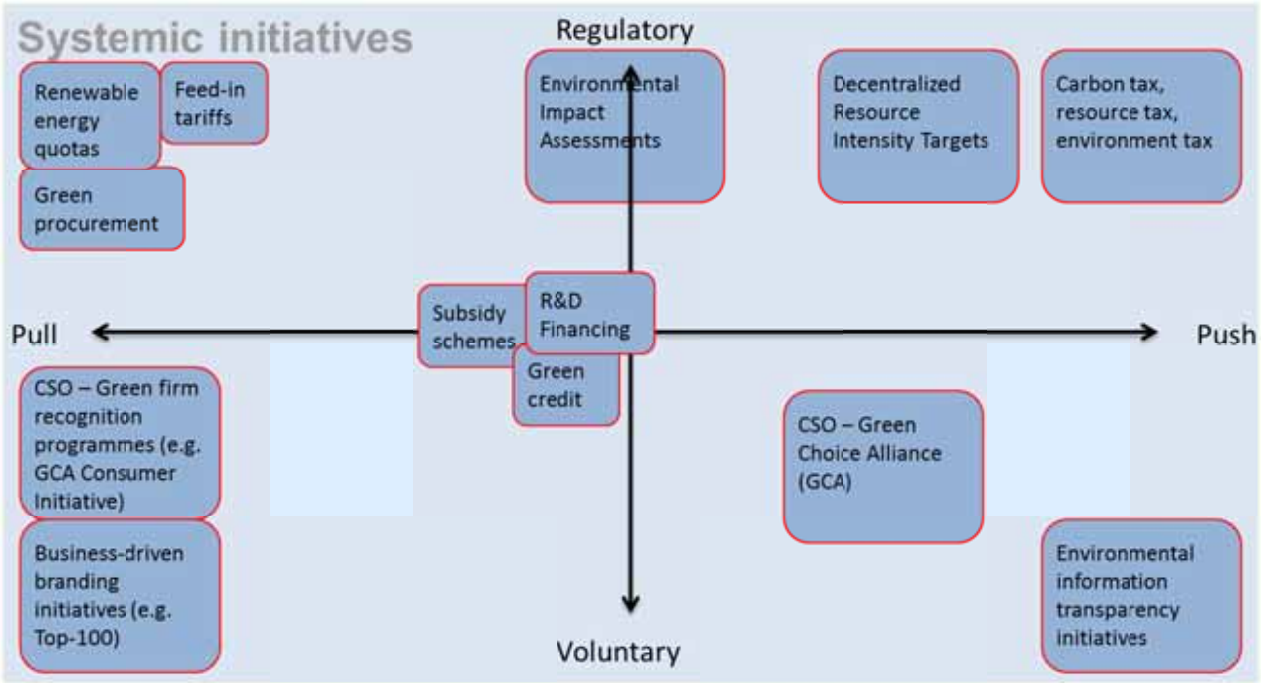
While often included in discussions of soft (voluntary) initiatives because of its origins in voluntary reductions initiatives in the Netherlands, the Top-1000 Energy-Consuming Enterprises Program provides one relatively well-documented example of current ways in which nationwide, non-voluntary public sector-driven targets are implemented in practice in China. Launched in 2006, the Top-1000 Program targeted the 1,000 highest energy-consuming enterprises in nine energy intensive industries, which between them had a total annual energy consumption above 180,000 tonnes coal equivalent (tce) in 2004 (Hogan et al, 2012), and set energy consumption targets for each of them. A significant amount of evaluation has been carried out over the life of the programme, led by the Lawrence Berkeley National Laboratory in California, though carried out in collaboration with local partners. Evidence suggests the programme has been successful in dramatically reducing energy consumption, though effectiveness was driven substantially by the ingenuity of local officials charged with implementation rather than simply by detailed policy guidance from the centre.

Source: Price and Wang, 2007; Price, Wang and Yun, 2008; Levine, Zhou and Price, 2009; Worrell, 2011, Kostka and Hobbs, 2012 (forthcoming).

4.3 Proposed case studies for further analysis

The preceding section describes a typology of policy and programme instruments, ranging from systemic policies – like the five-year plans and decade-long programmes of poverty alleviation, which articulate key themes and indicate the priorities of the government – to specific initiatives implemented by government at the central level (e.g. tax policy), local level (e.g. regulation and enforcement by EPBs), and sector level (e.g. SEI plans), to those implemented by business and NGOs (e.g. branding and information campaigns).

Figure 7: Mapping a typology of Chinese policies for green and inclusive growth



Having reviewed these various policies and initiatives, we have set out some proposed case studies for further analysis, spanning the range of these different approaches. We selected case studies that could be of interest in testing the 'triple win' hypothesis, i.e. potentially they

can simultaneously contribute to economic growth, social inclusion/poverty reduction, and improvements in environmental sustainability.

We also selected case studies based on the extent to which it seemed there were particularly useful lessons to be learnt from the policy process or implementation mechanism. We also assessed the relevance of the case studies to other countries, particularly other emerging economies, like India, in order to facilitate the comparison of different countries' approaches to similar problems, and to maximise the potential for wider lesson learning and knowledge exchange. Finally, we sought to identify case studies that had an interesting angle on the role of business in achieving these triple goals.

Accordingly, the following list of policies and initiatives constitutes the proposed focus for the main research phase that is planned as the next step in this programme.

Table 11: Initial shortlist of recommended case studies for further analysis

Proposed case study	Overview
State-led sustainable development initiatives: Top-10,000 Programme	Following the success of the Top-1000 Enterprises programme, which targeted reduced energy consumption by enterprises in nine energy intensive industries, the Top-10,000 programme, which expands the number of targeted enterprises, has been viewed as a policy mechanism with significant potential to improve the sustainability of growth. A significant amount of evaluation has been carried out over the life of the Top-1000 programme and this could provide the basis for future research (including collaboration with identified local partners). While the available literature to date has focused primarily on environmental variables (e.g. the reduction of energy consumption), further research, under the expanded programme, could widen the focus to include real-time evaluation of growth impacts (e.g. through competitiveness effects) and poverty reduction effects.
Private sector initiative I: China Greentech Initiative	The China Greentech Initiative is a collaborative effort between representatives of more than 100 private sector companies in China and aims to improve their position in the global green technologies market. The CGI focuses on market planning in five core areas including renewable energy, sustainability, low-carbon zones and natural resource management in urban areas, and aims to improve commercial opportunities for its members as well as help achieve Chinese national sustainability targets. As this is one of the best-organised private sector green initiatives, a case study here could explore the ways in which the private sector is responding to state incentives and helping to shape the green agenda. A better understanding of the coordination mechanisms underpinning the initative as well as the incentives among participating competitive enterprises may prove useful in addressing the so-called 'race to the bottom'.
Private sector initiative II: Top-100 Green Companies	The annual cross-sector index of the top 100 greenest companies in China, compiled by the Chinese Entrepreneurs Club, was created to showcase the companies as examples for other Chinese companies to emulate in terms of sustainability practices. The index shows sustainability trends in major Chinese companies and identifies which companies are new to the index and which have improved (or worsened) their position. While some informants interviewed during initial scoping activities viewed the list with scepticism, there is little evidence available on the impact of this initiative, suggesting a case study might be useful.
Strategic Emerging	Identified as a strategic emerging industry in the 12th FYP, new

Industries case study I: New energy vehicles	energy vehicles offer a discrete case that will give researchers the opportunity to better understand the ways in which large-scale investments in R&D and large-scale commercialisation function in practice. Such supply-side initiatives could be considered alongside demand-side subsidies for plug-in hybrid electric vehicles and pure electric vehicles. Focusing on a specific product would also allow for more detailed value chain mapping and decomposition to assess the extent to which investments in strategic emerging industries allow firms to move away from simple manufacturing into higher value-added activities at either end of the value chain. The poverty reduction impact could also be assessed.
Strategic Emerging Industries case study II: Renewable energy	Growth in renewable energy sources has been a widely publicised feature of the Chinese approach to sustainable development, and it is a key component of strategies under the 12th FYP, as efforts to increase the share of non-fossil fuels in primary energy consumption continue. A focus on wind power would generate interesting lessons as substantial generating capacity, component construction activity and policy support (e.g. feed-in tariffs) are already in place. Such a case study also has the potential to shed light on key cross-cutting issues, including coordination issues (e.g. between construction of generating capacity and necessary investments in grid capacity) and international trade dynamics. Similar dynamics in the solar sector suggest the potential for a comparative case study, though the choice to pursue solar, wind or both will likely depend on practical considerations.
Ecological compensation mechanism I: Forest-related compensation mechanisms	There is, as yet, little understanding of the impact of ecological compensation mechanisms on poverty in China. Interviews suggested that they are a key area of interest (e.g. for the World Bank). There are a wide range of such mechanisms across a variety of ecological targets. A number of potentially complementary ecological compensation initiatives have been implemented in the area of forest management. Two of these which may be of particular interest in future case study work are the Central Government Forest Ecosystem Compensation Fund (FECF) and the Provincial-Level FECF. These mechanisms are designed and implemented differently, but with a view to complementarity. Assessment of their impact (either alone or in combination) across the three dimensions of green growth would add significantly to the literature on ecological compensation.
Administrative unit case study: Ecological model county (specific location TBD)	One option for future detailed case study work is to narrow the research focus geographically (and administratively) while still considering the impact of a complete basket of specific policies, umbrella policies and institutional features. The scoping visit was limited to Beijing, and therefore the selection of an appropriate case study location would be entirely dependent on the knowledge of researchers contracted to carry out subsequent case studies and partner organisations. Given the emphasis of the research programme on cases from which lessons might be learned about successful strategies for achieving green growth, a focus on ecological model counties is likely to prove useful.
Monitoring initiative I: Carbon Trust/CTI certification scheme	Given the interest in the potential for demand from consumers or producers further down the supply chain to incentivise change, we suggest a case study that examines one of the information and signalling initiatives that seem to be proliferating in the Chinese context. One such initiative is the Carbon Trust/CTI programme, which provides independently verified public recognition of a Chinese firm's improved environmental practices through auditing

	and certification to the Carbon Trust Standard. Although this initiative is not private sector-led, it would be a useful case study, as it would allow a better understanding of companies willing to engage in such a certification scheme when it falls outside of government policy. The rigor of the scheme, its standards and its monitoring practices could be considered, as could the advantages certification brings to participants.

5 Conclusion

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. As this study has shown, 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 themselves and in other countries.

In some cases, the two countries are tackling similar problems in different ways, thus offering scope for direct comparison of the pros and cons of different approaches. Some of the case studies will facilitate this direct comparison, while others will generate lessons about broader approaches, such as the use of industrial development policies to promote particular new green sectors, or the use of voluntary approaches or industry-led initiatives to encourage greener business behaviour. The proposed case studies are listed in Table 12.

Table 12: Proposed case studies

China	India
Top 10,000 Programme Scheme to promote energy efficiency in key industries	Perform-Achieve-Trade Scheme Energy-efficiency trading scheme to reduce energy consumption across key industries
Pilot Emissions Trading Schemes in five cities	Green Buildings
Measures to promote renewable energy, e.g. wind or solar	Measures to promote renewable energy, e.g. wind or solar
Forest-related compensation mechanisms	National Rural Employment Guarantee Act (NREGA) Employment scheme focused on environmental preservation
Ecological model country	The E-waste rules Rules to encourage the proper recycling of electronic waste and attributing responsibility to the producers.
Measures to promote new energy vehicles One of the strategic emerging industries identified in China's 12th Five-Year Plan	Innovation Cluster Initiative Promoting technological upgrading and better operational practices to improve energy efficiency in the foundry sector
Top 100 Green Companies	Star rating and labelling programme

Private sector-led index showcasing greenest companies in China	Energy-efficiency rating scheme for electrical appliances and buildings
Carbon Trust certification scheme Monitoring carbon emissions	Bombay Stock Exchange – GREENEX Benchmarking of the carbon footprint of listed companies
China Greentech Initiative Private sector-led market planning to promote business and sustainability goals	Private sector-led green initiatives, e.g. the Indian conglomerate ITC's Social and Farm Forestry Programme
	Environmental Fiscal Reforms

The research to date has shown that the private sector has played an increasingly important role in both China and India since liberalisation, and is itself beginning to innovate. First by developing new markets that are likely to enjoy fast growth in a greener international economy, and second by promoting more sustainable and inclusive business models, responding to an increasingly clear business case that this is likely to contribute to long-term commercial success and market leadership. Measuring the impact of this innovation, both for the businesses themselves and for wider society, will help to promote a better understanding and awareness of the business case for such investment. Understanding the opportunities and constraints faced by business will be another key aspect of learning that can be used to inform policies that will help create an enabling environment for such investment.

We have also found that, as both countries move away from command and control models of economic management and towards market-based approaches that incentivise business activity rather than direct it, mechanisms are being put in place to incentivise and alter business activity to bring it into line with the wider goals of sustainable and inclusive growth. There will be much to learn from the success or otherwise of these mechanisms. Future research should thus help to develop an understanding of the intersection between government and business in terms of their respective contributions to achieving sustainable and inclusive growth.

The programme can also foster a better understanding of how successful economic management can be achieved in large countries like China and India, which set the overall policy direction nationally but which must implement policies at the state or provincial level given enormous differences in conditions across the country. The institutional mechanisms used by both countries to achieve this goal warrant further analysis.

Finally, the research to date has shown that the political economy of reform should be a key aspect of future analysis, as that can be one of the main determinants of policy success or failure. This should be a consideration at the micro level, including analysis of stakeholders who are likely to win or lose from greener growth patterns, thus contributing to a better understanding of the likely drivers and constraints for reform, and in turn informing the development of more influential policy-engagement strategies. Political economy analysis should also be undertaken at a macro level, in terms of understanding the overarching political context and its implications for both business incentives and public engagement on these issues, and how these help or hinder government in effecting the necessary long-run economic changes that will facilitate the transition to a green growth trajectory.

We would welcome feedback on the selected case studies and proposed approach.

References

Ablett, J., et al., 2010. India's urban awakening: building inclusive cities; sustaining economic growth, Mc. Kinsey Global Institute

Acemoglu, D., Johnson, S. and Robinson, J.A., 2001. The Colonial Origins of Comparative Development: An Empirical Investigation. *American Economic Review,* 91(5): 1369-1401.

Ahluwalia, M.S., 2000. State Level Performance Under Economic Reforms in India, Paper presented at the Centre for Research on Economic Development and Policy Reform Conference on Indian Economic Prospects: Advancing Policy Reform May 2000; Stanford University. Last accessed on 25.09.2012: http://www.planningcommission.gov.in/aboutus/speech/spemsa/msa007.pdf

Ahluwalia, M.S., 2002. 'Economic Reforms in India since 1991: Has Gradualism Worked?' The Journal of Economic Perspectives, Vol. 16, No. 2 ,pp. 67-88. American Economic Association.

Aizawa, M. and Yang, C., 2010. Green Credit, Green Stimulus, Green Revolution? China's Mobilization of Banks for Environmental Clean-up. *The Journal of Environment & Development*, 19(2): 119-144

Arora, A. and Bagde S., undated. 'The Indian Software Industry: The Human Capital Story'. Heinz School of Public Policy and Management, Carnegie Mellon University. Last accessed on 25.09.2012: http://www.abesit.in/pdfs/Human%20Capital%20in%20Indian%20Software%20Industry%20appreciated%20by%20Prof.Sukti%20Chakrabarti.pdf

Arora, S., et al., undated. Indian Companies with Solutions that the World Needs, Sustainability as a Driver for Innovation and Profit. Confederation of Indian Industries- World Wildlife Fund.

ASSOCHAM , 2012. 'India's Experience with FDI: Role of a Game Changer'. The Associated Chambers of Commerce and Industry of India.

ASSOCHAM, 2012. India's Experience with FDI: Role of a Game Changer. ASSOCHAM.

Awasthi, R., Dhariwal, V and Dube, S., undated. Can the Learning's from International Examples Make the 'Perform Achieve and Trade (PAT) Scheme' Perform Better for India, A Discussion Paper on India's Perform Achieve and Trade (PAT) Scheme. Emergent Ventures International.

Bannister, J. and Cook, G., 2011, Manufacturing in China: China's employment and compensation costs in manufacturing through 2008. *Monthly Labor Review*, March: 39-52.

Bardhan, P., 1996. Decentralised Development. *Indian Economic Review*, 31(2): 139-156.

BEE, 2011. Perform Achieve and Trade Scheme (PAT) Manual, Bureau of Energy Efficiency, Ministry of Power

Bennett, C. J,. 1991. 'Review Article: What is Policy Convergence and What Causes It?', British Journal of Political Science, 21, 215-33.

Bennett, M., 2009. *Markets for Ecosystem Services in China: An Exploration of China's 'Eco-Compensation' and Other Market-Based Environmental Policies*. Forest Trends report. [ONLINE] Available at: http://www.forest-trends.org/documents/files/doc_2317.pdf. [Accessed 10 September 12].

Bhati, M and Kumar, V., 2010. Status of Green Building Sector in India, Last accessed on 25.09.2012: http://www.nistads.res.in/indiasnt2010-11/T3_Industry/Status%20of%20Green%20building%20Sector%20in%20India.pdf

Bhati, M., and Kumar, V., undated. Status of Green building Sector in India. Last accessed on 25.09.2012: http://www.nistads.res.in/indiasnt2010-11/T3_Industry/Status%20of%20Green%20building%20Sector%20in%20India.pdf

Bhattacharya, S. C., and Jana, C., 2009. Renewable energy in India: Historical developments and prospects. Energy and its sustainable development for India , 34 (8), 981-991.

Bloom, D., 2011. 'Population Dynamics in India and Implications for Economic Growth' January 2011. PGDA Working Paper No. 65. Program on the Global Demography of Aging

Bloomberg. 2012. *China's Bo Signals Wealth Gap Breached Unrest Trigger Point*. [ONLINE] Available at: http://www.bloomberg.com/news/2012-03-09/china-s-gini-coefficient-exceeds-trigger-for-unrest-chongqing-s-bo-says.html. [Accessed 18 September 12].

Bowen. A, 2012. Green' Growth, 'Green' Jobs and Labor Markets, World Bank, 2012

BP, 2012. BP Energy Outlook 2030, British Power, 2012. Last accessed on 16.10.2012: http://www.bp.com/liveassets/bp_internet/globalbp/STAGING/global_assets/downloads/O/2012_2030_energy_outlook_booklet.pdf

Brand, U., 2012. Green Economy – the Next Oxymoron? No Lessons Learned from Failures of Implementing Sustainable Development. GAIA 21/1, 28-32.

BSE India. (undated). Retrieved 09 21, 2012, from Bombay Stock Exchange: http://www.bseindia.com/about/abindices/Carbon.asp (accessed September 2012)

Business Green, 2010. *China revs up green car industry with fresh subsidies*. [ONLINE] Available at: http://www.businessgreen.com/bg/news/1802177/china-revs-green-car-industry-fresh-subsidies. [Accessed 10 September 12].

Business Standard, 2012. Karif Crop Production to drop by 10%. The Business Standard, last accessed on 16.10.2012: http://www.business-standard.com/india/news/kharif-crop-production-to-drop-by-10-due-to-scanty-rains/188147/on

Campbell, R. J., 2010 *China and the United States—A comparison of green energy programs and policies* [Electronic version]. Washington, DC: Congressional Research Service.

Campos, J.E. and Hellman, J., 2005. 'Governance Gone Local: Does Decentralization Improve Accountability?' in World Bank, 2005. *East Asia Decentralizes*. Washington, DC: World Bank.

Chatham House, Energy Research Institute, Jilin University, and E3G, 2010. *Low Carbon Development Roadmap for Jilin City*. London: Royal Institute of International Affairs. [ONLINE] Available at: http://www.chathamhouse.org/sites/default/files/public/Research/Energy,%20Environment%20and%20Development/r0310_lowcarbon.pdf. [Accessed 10 September 12].

Cheung, K., 2011. *Integration of Renewables Status and challenges in China*. International Energy Agency Working Paper. Paris: IEA.

China Daily. 2012. *Country's wealth divide past warning level*. [ONLINE] Available at: http://www.chinadaily.com.cn/china/2010-05/12/content_9837073.htm. [Accessed 18 September 12].

China Development Gateway. 2012. *2011年中国农民工调查监测报告(全文)*. [ONLINE] Available at: http://cn.chinagate.cn/reports/2012-05/07/content_25322724.htm. [Accessed 14 June 12].

China Environment Net. 2008. *China's Environmental Protection Situation in Early 1990s*. [ONLINE] Available at: http://www.chinaenvironment.com/view/viewnews.aspx?k=20081127150329689. [Accessed 11 September 12].

ChinaFAQs. 2012. *China Moving Forward on 12th Five Year Plan Climate and Energy Implementation; Targets, Taxes, Emissions Trading Plans in Development*. [ONLINE] Available at: http://www.chinafaqs.org/blog-posts/china-moving-forward-12th-five-year-plan-climate-and-energy-implementation-targets-taxes-. [Accessed 11 September 12].

Clayton, B. D., and Bass, S., 2009. Experience of Integrating Environment into Development Institutions and Decisions. Environmental Governance no. 3, International Institute for Environment and Development, London

Climate Development Knowledge Network, 2012. CDKN Inside Story: Transforming India into a Solar Power. Last accessed on 25.09.2012: http://cdkn.org/resource/cdkn-inside-story-transforming-india-into-a-solar-power/

Coal India, 2012. Chairman's Speech at the Annual General meeting. Last accessed on 17.10.2012: http://www.coalindia.in/Documents/Events/Chairmans_Speech_38th_Annual_General_Meeting_18092012.pdf

Cohn and Wolfe. 2011. *The 2011 Green Brands survey*. [ONLINE] Available at: http://www.cohnwolfe.com/en/ideas-insights/white-papers/green-brands-survey-2011. [Accessed 23 July 12].

Confederation of Indian Industries, 2007. Sustainability reporting - The Indian Business Case 2007, Confederation of Indian Industries

Corporate Catalyst India, 2012. 'Report: India's Pharmaceuticals Industry', Corporate Catalyst India

CRISIL, 2010. 'Skilling India: The Billion People Challenge' November 2010. CRISIL Centre for Economic Research. Last accessed on 25.09.2012: http://crisil.com/pdf/corporate/skilling-india_nov10.pdf

CRISIL, 2012. 'Economic Turnaround Hinges on Private Sector Rebound', Press Release July 2012. CRISIL Research. Last accessed on 25.09.2012: http://crisil.com/Ratings/Brochureware/News/CRISIL-Research-private-sector-pr_170712.pdf?cn=null

CRISIL, 2012. Why is it critical to revive the private sector? Last accessed on 01.11.2012: http://www.moneycontrol.com/news/crisil-research/crisil-why-is-it-critical-to-reviveprivate-sector_731436.html

CSSN, 2012. 1992年：社会主义市场经济体制改革目标确立. [ONLINE] Available at: http://www.cssn.cn/news/486988.htm. [Accessed 29 October 12].

Department for Industrial Policy and Promotion, 2011. National Manufacturing Policy, Press Note, Ministry of Commerce and Industry. Last accessed 21.09.2012: http://dipp.nic.in/English/policies/National_Manufacturing_Policy_25October2011.pdf

Department of Public Enterprises, 2012. Guidelines on Sustainable Development for the Year 2012-13, Ministry of Heavy Industries and Public Enterprises, Government of India

Dhrmadhikary.S, 2010. The Movement of India, Energy Policy Special, Volume 5, Issue 2, September 2010. Last accessed on 25.09.2012: http://www.manthan-india.org/IMG/pdf/Article_Shripad_from_MOI_July_Aug_2010.pdf

Dogra, S., 2011. India and China's 12th Five-Year Plans: A Comparison of Changing Priorities, Institute of South Asian Studies, National University of Singapore. 2011

Dolowitz, D. and Marsh, D., 1996. 'Who Lea Learns What from Whom: a Review of the Policy Transfer Literature', Political Studies, 44, 343-57

Dolowitz, D. and Marsh, D., 2000. 'Learning from Abroad: the Role of Policy Transfer in Contemporary Policy-Making', Governance, 13 (1), 5-24.

Downing, T. E., 2002. Avoiding New Poverty: Mining-Induced Displacement and Resettlement, International Institute for Environment and Development- Mining Minerals and Sustainable Development, April 2002.

Downs, A., 1965. A theory of bureaucracy. *The American Economic Review*, 55(1/2): 439-446.

Downs, E., 2006. *The Brookings Foreign Policy Studies Energy Security Series: China*. Washington DC: The Brookings Institution.

Dube, S., Awasthi, R., and Dhariwal, V., 2011. Can the Learning's from International Examples Make the 'PAT' Scheme Perform better for India. Emergent Ventures International.

Dun and Bradstreet, 2012. India's Energy sector, last accessed on 21.09.2012: http://www.dnb.co.in/IndiasEnergySector/Power_Gen.asp

Economy, E.C., 2004. *The River Runs Black: The Environmental Challenge to China's Future*. Ithaca: Cornell University Press.

Edelweiss Research, 2009. GDP, Slowdown spreads to consumption, accessed online: http://www.edelresearch.com/rpt/showpdf.aspx?id=21376&reportname=/GDP_-_Q1FY13-EDEL.pdf&lgt=656vfdg&type=ynaj9XvqmJoptbYzJzovtA==

Edin, M., 1998. Why Do Chinese Local Cadres Promote Growth? Institutional Incentives and Constraints of Local Cadres. *Forum for Development Studies*, 1: 97-127.

Edin, M., 2003a. Remaking the Communist Party-State: The Cadre Responsibility System at the Local Level in China. *China: An International Journal,* 1(1): 1-15.

Edin, M., 2003b. Local State Corporatism and Private Business. *Journal of Peasant Studies*, 30(3-4): 278-295.

Esty, D. C., and Ivanova, M., 2004. Globalization and Environmental protection: a Global Governance Perspective. Yale Center for Environmental law and Policy, working paper no. 0402 .

EY, 2011. Cleantech industry: An Overview, Presented by Ernst and Young at the 5th Renewable Energy India 2011 Expo. Last accessed on 30.09.2011: http://www.ey.com/Publication/vwLUAssets/India_cleantech_industry_overview_Aug_2011/$FILE/India_cleantech_industry_overview_Aug_2011.pdf

FICCI, 2012. 'Current state of the Indian Economy: Challenges and the way ahead'. Last accessed on 25.09.2012: http://www.ficci.com/ficci-press-indian-economy-june4.pdf

FICCI, 2012. 'FICCI's Twelve Point Action Agenda for Stimulating India Economy's Growth' June 2012, Federation of Indian 92012Chambers of Commerce & Industry.

Financial Express, 2012. Bid to Launch Renewable Energy Certificate Under Way., Financial Express. Last Accessed: http://www.financialexpress.com/news/bid-to-launch-renewable-energy-certificates-under-way/479508/0

Financial Times, 2012. Indian inflation rises as food prices jump, Financial Times, 2012. Last accessed on 25.09.2012: http://www.ft.com/cms/s/77718118-b5f8-11e1-a511-00144feabdc0,Authorised=false.html?_i_location=http%3A%2F%2Fwww.ft.com%2Fcms%2Fs%2F0%2F77718118-b5f8-11e1-a511-00144feabdc0.html&_i_referer=

Fulai, S., undated. A Green Economy: Conceptual Issues. United Nations Environment Program, Last accessed 25.09.2012: http://www.unep.org/civil-society/Portals/59/Documents/GMGSF12-GE-Conceptual-Issues.pdf

GIZ, 2012. Responsible Finance, A Catalyst for Responsible Business. International and Indian Trends and Challenges in Responsible Finance. GIZ- Ernst and Young

Global Wind Energy Council, 2011. Indian Wind Energy Outlook 2011, Ministry of New and Renewable Energy, Government of India

Gong, X., Kong, S.T., Li, S. and Meng, X., 2008. Rural-Urban Migrants: A driving force for growth. In L. Song and W.T. Woo, eds. 2008. *China's Dilemma: Economic Growth, The Environment and Climate Change*. Canberra: ANU E Press. Ch. 6.

Gordon, R.H. and Li, W., 2011. *Provincial and Local Governments in China: Fiscal Institutions and Government Behavior*. NBER Working Paper No. 16694. Cambridge: NBER.

Government of Guiyang, 2010. *中国农民工问题总体趋势：观测'十二五'*. [ONLINE] Available at: http://www.gygov.gov.cn/gygov/1442575838561435648/20101026/267581.html. [Accessed 10 September 12].

Government of India, 2006. Integrated Energy Policy, Report of the Expert Committee, 2006, Planning Commission, Government of India

Government of India, 2012. Government of India, Supplementary Press Note on Poverty Estimates. Dated: March 20, 2012, Press Information Bureau. Last accessed on 25.09.2012: http://planningcommission.nic.in/news/press_elepov2103.pdf

Greenpeace, 2012. How Coal Mining is Trashing Tigerland. Last accessed on 17.10.2012: http://www.greenpeace.org/india/Global/india/report/How-Coal-mining-is-Trashing-Tigerland.pdf

Gupta, A., Vora, B. and Tungatkar, S., 2010. 'Indian Retail Industry' May 2010. Interconnected Stock Exchange of India

Gupta, K. and Jain, T., 2012. 'GDP slowdown spreads to consumption', India Equity Research - Edelweiss Securities Limited

Gupta, R., 2012. 'FDI in Indian Retail Sector: Analysis of Competition in Agri-Food Sector', Internship Project Report. Competition Commission of India. Last accessed on 25.09.2012: http://cci.gov.in/images/media/ResearchReports/FDI%20in%20Indian%20Retail%20Sector%20Analysis%20of%20Competition%20in%20Agri-Food%20Sector.pdf

GWEC, 2011. Indian Wind Energy Outlook, 2011. Global Wind Energy Outlook. Last accessed on 30.09.2012: http://gwec.net/wp-content/uploads/2012/06/IWEO_2011_lowres.pdf

Gyan Analytics and Research Pvt. Ltd. , 2012. The Potential for Renewable Energy in India – 2012. Last accessed on 30.09.212: http://www.gyananalytics.com/The%20Potential%20of%20Renewable%20Energy%20in%20India%20-%202012.pdf

Hart, S. L., 1997. Beyond Greening: Strategies for a Sustainable World. Harvard Business Review.

Heberer, T. and Senz, A., 2011. Streamlining Local Behaviour through Communication, Incentives and Control: A Case Study of Local Environmental Policies in China. *Journal of Current Chinese Affairs*, 3: 77-112.

Hogan, P., Falconer, A., Micale, V., Vasa, A., Yu, Y., Zhao, X., 2012. *Tracking Emissions and Mitigation Actions: Current Practice in China, Germany, Italy, and the United States*. CPI Working Paper. San Francisco: Climate Policy Initiative.

Hsiao, William C., 2007. The political economy of Chinese health reform. *Health Economics, Policy and Law*, 2(03): 241-249.

http://mhupa.gov.in/W_new/Slum_Report_NBO.pdf

http://povertydata.worldbank.org/poverty/country/IND

IIEC, 2010. India Energy Handbook, Demand Driven, Supply Chained. International Energy Consulting Corporation, August, 2010. Last accessed 19.10.2012: http://www.psimedia.info/handbook/India_Energy_Handbook.pdf

India Today, 2012. Power Outrage in Delhi, Sheila Dikshit Asks People to Reduce Consumption. Last accessed 16.10.2012: http://indiatoday.intoday.in/story/power-outage-in-delhi-sheila-dikshit-asks-people-to-reduce-consumption/1/203611.html

Indian Express,2012. Worse than Hindu rate of growth. Last accessed on 25.09.2012 at: http://www.indianexpress.com/news/columnworsethanhindurateofgrowth/980497/

Information Office of the State Council, 2011. *New Progress in Development-Oriented Poverty Reduction Program for Rural China*. [ONLINE] Available at: http://www.china.org.cn/government/whitepaper/node_7142125.htm. [Accessed 10 September 12].

International Institute on Sustainable Development, 2010. Delivering on G-20 Commitments: The path to fossil-fuel subsidy reform. International Institute for Sustainable Development.

International Labor Organisation, 2011. 'Green jobs becoming a reality: Progress and Outlook 2012', International Labour Organization.

International Labour Organization, 2009. Green Jobs and Women Workers Employment, Equity, Equality. International Labour Foundation for Sustainable Labor

International Labour Organization, 2012. 'Global Employment Trends 2012: Preventing a deeper jobs crisis', International Labour Organization.

International Labour Organization, 2012. Green jobs becoming a reality Progress and outlook 2012, International Labour Office. Last accessed on 25.09.2012: http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_168068.pdf

INWEA, 2012. Indian Wind Energy Association. Last accessed on 21.09.2012: http://www.inwea.org/

INWEA, undated. Indian Wind Energy Association, Last accessed on 25.09.2012: http://www.inwea.org/aboutwindenergy.htm

ITC Ltd., 2011. ITC Annual Report. Last accessed on 26.09.2012: http://www.itcportal.com/sustainability/lets-put-india-first/forestry.aspx

James, O. and Lodge, M., 2003. The Limitations of 'Policy Transfer' and 'Lesson Drawing' for Public Policy Research, Political Studies Review: 2003 VOL 1, 179-193

Jha, D. V., 1999. Investment Liberalization and environmental protection, conflicts and compatibilities in the case of India. UNCTAD/DICM Project.

Jin L., 2011. P*olicy instruments taking account of the rural environment and poverty*. Internal Report of IPRCC sponsored project. Unpublished.

Jing, J., 2000. *Environmental protests in rural China.* In Perry, E.J. and Selden, M., eds 2000. *Chinese Society, Change, conflict and resistance* (2nd ed.) London: Routledge Curzon. Ch 9.

Johnston, P. C., Gomez, J. F., and Laplante, B., 2012. Climate Risk and Adaption in the Electric Power sector. Asian Development Bank.

Joshi, et al., 2010. Skilling India, The Billion People Challenge: A report by CRISIL Centre for Economic Research, last accessed 25.09.2012: http://crisil.com/pdf/corporate/skilling-india_nov10.pdf

Kapil Gupta, T. J., 2012. GDP Slowdown spreads to consumption. Edelweiss.

Kapoor, A., 2012. India's Power Matrix, Institute of Competitiveness. Last accessed on 21.09.2012: http://competitiveness.in/2012/05/19/indias-power-matrix/

Kapoor, A., 2012. The looming water Crisis, Institute for Competitiveness. Last accessed on 09 21, 2012: http://competitiveness.in/wp-content/uploads/2012/07/Looming-Water-Crisis-.pdf

Kappor,A. and Pachouri, A., 2011. The Sustainable Competitiveness Report 2011, Institute of Competitiveness.

Kossoy, A. and Guigon, P., 2012. *State and Trends of the Carbon Market 2012*. Washington DC: World Bank.

Kostka, G. and Hobbs, W. (2012, *forthcoming*) 'Local Energy Efficiency Policy Implementation in China: Bridging the Gap between National Priorities and Local Interests', *China Quarterly*.

Kostka, G., and Harrison, T., 2012. *Manoeuvres for a Low Carbon State: The Local Politics of Climate Change in China and India*, DLP Research Paper 22. [ONLINE] Available at: http://www.dlprog.org/ftp/info/Public%20Folder/Manoeuvres%20for%20a%20Low%20Carbon%20State.pdf.html. [Accessed 11 September 12].

Kothari, R. 2012. Politics in India. Second Edition. Orient Black Swan, Hyderabad. First published in India 1970

KPMG Advisory (China) Limited, 2011a. *China's 12th Five-Year Plan: Sustainability*. Beijing: KPMG.

KPMG Advisory (China) Limited, 2011b. *China alert: Energy & Natural Resources Focus. Issue 8 – November* . Beijing: KPMG.

Kurian, N.J., 2007. Widening economic & social disparities: Implications for India, Indian J Med Res 126, October 2007, pp. 374-380), last accessed on 25.09.2012: http://icmr.nic.in/ijmr/2007/october/1014.pdf

Lee. J., 2012. *China's Fake Carbon Tax*. [ONLINE] Available at: http://online.wsj.com/article/SB10001424052970204257504577152141420308320.html. [Accessed 10 September 12].

Levine, M. D., Zhou, N. and Price, L., 2009. The Greening of the Middle Kingdom: The Story of Energy Efficiency in China. *The Bridge*, 39(2): 44-54.

Li, W., Xu, J. and He, H., 2010. 'Has The Centralized Environmental Governance Regime Worked in China?' Working paper, Environmental Economics Program in China. [ONLINE] Available at:

http://www.efdinitiative.org/research/publications/publications-repository/has-the-centralized-environmental-governance-regime-worked-in-china. [Accessed 10 September 12].

Liu, L., 2008. 'Sustainability Efforts in China: Reflections on the Environmental Kuznets Curve Through a Locational Evaluation of "Eco-Communities"'. *Annals of the Association of American Geographers*. 98(3): 604-629.

Liu, L., 2011. *Understanding China's Climate Change Mitigation Policy Development: Structures, Processes and Outcomes*. FIU Electronic Theses and Dissertations Paper 429. Available online at: http://digitalcommons.fiu.edu/etd/429

Ma T., 2009. *Environmental Mass Incidents in Rural China: Examining Large-Scale Unrest in Dongyang, Zhejiang*. China Environment Series 10, 2008/2009. Washington DC: Woodrow Wilson Center.

Ma, J., Cheung, R., et al., 2010. *Greening Supply Chains in China: Practical Lessons from China-based Suppliers in Achieving Environmental Performance*. WRI Working Paper. World Resources Institute, Washington, DC.

Mahadevan, R., 2003. PRODUCTIVITY GROWTH IN INDIAN AGRICULTURE: THE ROLE OF GLOBALIZATION AND ECONOMIC REFORM. Asia-Pacific Development Journal Vol. 10, No. 2, December 2003, last accessed on 25.09.2012: http://www.unescap.org/pdd/publications/apdj_10_2/mahadevan.pdf

Mahadevia, D., 2006. NURM and the Poor in Globalising Mega Cities. Economic and Political Weekly, 41 (31), 3399-3403.

Managi, S., and Jena, P. R., 2007. Environmental productivity and Kuznets curve in India. Ecological Economics .

Maplecroft., 2011. World's fastest growing populations increasingly vulnerable to the impacts of climate change – 4th global atlas reports. Last accessed on 09 21, 2012: http://maplecroft.com/about/news/ccvi_2012.html

Mehta, P. S., 2007. Why was India's Ecomark Scheme Unsuccessful. CUTS International.

MEP, 2011a. *The Achievements of 11th Five Year Plan: The Progress of Environmental Protection*. [ONLINE] Available at: http://www.zhb.gov.cn/zhxx/hjyw/201103/t20110311_201713.htm. [Accessed 10 September 12].

MEP, 2011b. *国务院关于印发国家环境保护"十二五"规划的通知*. [ONLINE] Available at: http://www.gov.cn/zwgk/2011-12/20/content_2024895.htm. [Accessed 10 September 12].

Ministry of Corporate Affairs, 2011. The Companies Bill, Ministry of Corporate Affairs, Government of India.

MIT Sloan Management Review, 2009. The Business of Sustainability, Findings and Insights from First Annual Business of Sustainability Survey and The Global thought Leader's Project. MIT Sloan Management Review, Boston Consulting Group and SAS. Last accessed 15.10.2012: http://www.mitsmr-ezine.com/busofsustainability/2009#pg1

MIT, 2009. The Observatory of Economic Complexity, Massachusetts Institute of Technology, Last accessed on 27.09.2012: http://atlas.media.mit.edu/

Mittermeier, R.A., Gil P.R. and Mittermeier, C.G., 1997. Megadiversity: Earth's Biologically Wealthiest Nations. Conservation International, Cemex.

MNRE , undated. Ministry of New and Renewable Energy, Last accessed on 25.09.2012: http://www.mnre.gov.in/mission-and-vision-2/mission-and-vision/

MoEF, 2006. National Environment Policy, 2006, Government of India, Centre for Environment education. Last accessed on 25.09.2012: http://envfor.nic.in/nep/nep2006e.pdf

MoEF, 2010. Climate Change and India: A 4X4 Assessment, A Sectoral and regional Analysis for 2030. Ministry of Environment and Forests. Last accessed on 25.09.2012: http://moef.nic.in/downloads/public-information/fin-rpt-incca.pdf.

MoEF, 2011. Sustainable Development in India: Stocktaking in the run up to Rio+20. Government of India, Ministry of Environment & Forests.

MoEF, 2012. Ministry of Environment & Forests. Last accessed on 21.09.2012: http://moef.nic.in/divisions/ic/wssd/doc3/chapter14/css/Chapter14.htm

MoEF., 2010. Climate Change & India: A 4X4 Assessment, A sectoral and regional Analysis for 2030s., Ministry of Environment and Forests, Government of India, Indian Network for Climate Change Assessment.

Montinola, G., Qian,Y. and Weingast, B., 1996. Federalism, Chinese Style: The Political Basis for Economic Success. *World Politics*, 48(1): 50-81.

Moored, 2012. Jawahar Lal Nehru National Urban Renewal Mission: Towards Better Cities. Ministry of Urban Development, Government of India.

Nayyar, D. and Jain, S., 2012. 'Why young job seekers will find it difficult to get employed' , India Today. Last accessed on 21.09.2012: http://m.indiatoday.in/story/booming-sectors-freeze-hiring-recession-rising-unemplyoment-young-job-seekers/1/216465.html

NBS, 2002a. *China Statistical Yearbook 2002*. Beijing: China Statistics Press

NBS, 2002b. 中华人民共和国国家统计局关于1995年国民经济和社会发展的统计公报. [ONLINE] Available at: http://www.stats.gov.cn/tjgb/ndtjgb/qgndtjgb/t20020331_15390.htm. [Accessed 21 September 12].

NBS, 2004. *China Rural Poverty Monitoring Report 2004*. Beijing: China Statistics Press.

NBS, 2008. 改革开放30年报告之五：城乡居民生活从贫困向全面小康迈进. [ONLINE] Available at: http://www.stats.gov.cn/tjfx/ztfx/jnggkf30n/t20081031_402513470.htm. [Accessed 29 October 12].

NBS, 2011a. *China Rural Poverty Monitoring Report 2011*. Beijing: China Statistics Press.

NBS, 2011b. *中国全面建设小康社会进程统计监测报告（2011）*. [ONLINE] Available at: http://www.stats.gov.cn/tjfx/fxbg/t20111219_402773172.htm. [Accessed 21 September 12].

NBS, 2012. *Income of Urban and Rural Residents in 2011*. [ONLINE] Available at: http://www.stats.gov.cn/english/pressrelease/t20120130_402787464.htm. [Accessed 10 September 12].

NDRC, 2012. *The People's Republic of China National Report on Sustainable Development*. [ONLINE] Available at: http://www.sdpc.gov.cn/xwzx/xwtt/t20120601_483687.htm. [Accessed 21 September 12].

New York Times, 2011. *China Uses Feed-In Tariff to Build Domestic Market*. [ONLINE] Available at: http://www.nytimes.com/cwire/2011/09/14/14climatewire-china-uses-feed-in-tariff-to-build-domestic-25559.html?pagewanted=all. [Accessed 10 September 12].

New York Times. 2012. *China's Growth Rate Slowed in the 2nd Quarter*. [ONLINE] Available at: http://www.nytimes.com/2012/07/13/business/global/chinas-growth-rate-slowed-in-the-2nd-quarter-down-sharply-from-a-year-ago.html?_r=0. [Accessed 21 September 12].

OECD, 2011. *Towards Green Growth*. [ONLINE] Available at: http://www.oecd.org/greengrowth/48012345.pdf. [Accessed 21 September 12].

Oi, J. C., 1992. Fiscal Reform and the Economic Foundations of Local State Corporatism in China. *World Politics*, 45(1): 99-126.

Oi, J. C., 1995. The Role of the Local State in China's Transitional Economy. *The China Quarterly*, 144: 1132-1149.

Ostrom, E., Gibson, C., Shivakumar, S., and Andersson, K., 2002. *Aid, Incentives, and Sustainability: An Institutional Analysis of Development Cooperation*. SIDA Studies in Evaluation 02/01:1, Commissioned by SIDA, Department for Evaluation and Internal Audit. Stockholm: SIDA

Paliwal, R., 2006. EIA practice in India and its evaluation using SWOT Analysis. Centre for Regulatory and Policy Research .

Pande, R., 2001. Can Mandated Political Representation Increase policy Influence for Disadvantaged minorities? Theory & Evidence from India.

Panigrahi, J. K., & Amirapu, S., 2012. An assessment of EIA system in India. Environmental Impact Assessment Review, 35, 23-36.

Pearce, D., undated. Incentives for Private Sector Financing of Sustainable Development. Centre for Social and Economic Research on the Global Environment, University College, London.

People's Daily. 2011. *China's resource tax reform will not affect oil price: authorities*. [ONLINE] Available at: http://english.peopledaily.com.cn/90778/7625617.html. [Accessed 23 July 12].

Pew, 2011. *Who's Winning the Clean Energy Race? 2010 Edition: G-20 Investment Powering Forward*. The Pew Charitable Trusts.

Pew, 2012a. *Who's Winning the Clean Energy Race? 2011 Edition: G-20 Investment Powering Forward*. The Pew Charitable Trusts.

Pew, 2012b. *Who's Winning the Clean Energy Race? 2010 Edition: China Country Profile*. The Pew Charitable Trusts.

Planning Commission of India, 2011. Faster, Sustainable and More Inclusive Growth: - An approach to the 12th Five Year Plan. Planning Commission, Government of India.

Planning commission of India, 2011. Interim Report of the Expert Group on Low Carbon Strategies for inclusive Growth. Planning Commission.

Planning Commission of India, 2012. The Manufacturing Plan, Strategies for Accelerating Growth of Manufacturing in India in the 12th Five-Year Plan and Beyond. Government of India.

Planning Commission, 2012. SUSTAINABLE DEVELOPMENT Emerging Issues in India's Mineral Sector, Institute for Studies in Industrial Development, Government of India

PRC, 2012. *国家林业局要求进一步加强林地确权登记发证工作*. [ONLINE] Available at: http://www.forestry.gov.cn/portal/main/s/195/content-534037.html. [Accessed 23 July 12].

Price, L. and Wang, X., 2007. *Constraining Energy Consumption of China's Largest Industrial Enterprises Through the Top-1000 Energy-Consuming Enterprise Program*. Proceedings of the 2007 ACEEE Summer Study on Energy Efficiency in Industry. Available online at: http://escholarship.org/uc/item/9pn4m6pw.

Price, L., Wang, X. and Yun, J., 2008. *China's Top-1000 Energy-Consuming Enterprises Program: Reducing Energy Consumption of the 1000 Largest Industrial Enterprises in China*. Berkeley: Ernest Orlando Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division.

Qian, Y. and Weingast, B.R., 1997. 'Federalism as a Commitment to Preserving Market Incentives', *The Journal of Economic Perspectives*. 11(4): 83-92.

Qiao, Y. and Wang, C., 2011. Issues and Challenges in Implementing China's Green Public Procurement Program. *Journal of Environmental Protection*, 2: 1034-1045

QQ News. 2012. *1992年：社会主义市场经济体制改革目标确立*. [ONLINE] Available at: http://news.qq.com/a/20090724/000788.htm. [Accessed 20 July 12].

Remme U., Trudeau N., Graczyk D. And Taylor P. , 2011. 'Technology Development Prospects For the Indian Power Sector' February 2011. International Energy Agency.

Reuters. 2011. *RPT-UPDATE 2-China resource tax goes national; adds coal, rare earths*. [ONLINE] Available at: http://www.reuters.com/article/2011/10/11/china-resources-tax-idUSL3E7LB04620111011. [Accessed 23 July 12].

Rodrik, Dani. *One Economics, Many Recipes: Globalization, Institutions, and Economic Growth*. Princeton University Press, 2007

Rozelle, S., Huang, J. and Zhang, L., 1997. Poverty, population and environmental degradation in China. *Food Policy*, 22(3): 229-251

Sandra Sequeira, S. et al., 2011. Consumer Demand for the Fair Trade Label: Evidence from a Field Experiment, last accessed on 17.10.2012: http://www.mit.edu/~jhainm/Paper/hhs.pdf-

Sataye, A.J., 2007. Investment and Action to Reduce Deforestation, Last accessed on 27.09.2012: http://ies.lbl.gov/ppt/gifc-jsathaye.pdf

Sathaye, J., Shukla, P. R., and Ravindranath, N. H., 2006. Climate change, sustainable development and India: Global and national concerns. Current Science , 90 (3).

Securities Exchange Board of India, 2012. Securities Exchange Board of India: Circular on Business Responsibility Reports.

Shambhu, G., 2010. Micro, Small and Medium Enterprises (MSMEs) in India: An Appraisal

Shankar. S., 2010. Shadow Integrated Energy Policy (IEP), A critique on Planning Commission document on Integrated Energy Policy. Prepared for National Alliance of Movements Against Coal, Last accessed on 25.09.2012: http://www.d-sector.org/pdfs/Shadow-IEP-Final-Draft.pdf

Shanxi Coal, 2002. 我国煤炭资源概况. [ONLINE] Available at: http://www.sxcoal.com/sources/2987/print.html. [Accessed 21 September 12].

Shen, K.T., 2012. Local and Central Government Relations: Impulsive investments and sustainable development. In Keely and Zheng, eds. 2012. *Green China: Chinese insights on environment and development.* London: International Institute for Environment and Development. Ch 12.

Singh, S.P., 2009. India 2006 National Environment Policy, Not a Paradigm Shift, CUTS CITEEE. Last accessed on 25.09.2012: http://www.ieepa.org/news/Other/20100917175453892.pdf

Singh, E.J., 2009. Biodiversity conservation and natural resources in North East India - with special reference to Manipur, NeBIO Vol. 1(1), p: 42-47. Last accessed on 25.09. 2012: http://nebio.in/neceer/NEBIO112010_42_47_Singh_etal.pdf

SME chamber of India, undated. Last accessed on 21.09.2012: http://www.smechamberofindia.com/About_MSMEs.aspx

Soonee, S. K., Garg, M., and Prakash, S., 2010. Renewable Energy Certificate Mechanism in India.

Su, M. and Zhao, Q., 2004. *China's Fiscal Decentralization Reform*. Beijing: China Ministry of Finance, Research Institute for Fiscal Science. [ONLINE] Available at: http://www.econ.hitu.ac.jp/~kokyo/APPPsympo04/PDF-papers-nov/Zhao-China.pdf. [Accessed 10 September 12].

Sukhdev, P., Stone, S., and Nuttall, N., 2010. UNEP Green Economy: Developing Countries Success stories. United Nations Environment Program.

TEEB, 2010. The Economics of Ecosystems and Biodiversity, Mainstreaming the Economics of Nature, A Synthesis of the Approach, Conclusions and Recommendations of TEEB. Last accessed on 27.09.2010: http://www.teebweb.org/Portals/25/TEEB%20Synthesis/TEEB_SynthReport_09_2010_online.pdf

Teng, F., Wang, Y., Gu, A., Xu, R., McMahon, H., Seligsohn, D., 2009. *Mitigation Actions in China: Measurement, Reporting and Verification*. WRI Working Paper. Washington, DC: World Resources Institute.

TERI, 2009. India's energy security; New Opportunities for a sustainable future. The Energy and Resources Institute.

TERI, 2012. Fossil-Fuel Subsidy Reform in India: Cash transfers for PDS kerosene and domestic LPG. The Energy and Resources Institute, RESEARCH REPORT August 2012. Last accessed on 25.09.2012: http://www.iisd.org/gsi/sites/default/files/ffs_india_teri_rev.pdf

The Asian Development Bank, 2012. Asian Development Outlook 2012: Confronting Rising Inequality in Asia. Last accessed on 25.09.2012: http://www.adb.org/sites/default/files/ado2012-ind.pdf

The Climate Group, 2011. *Delivering Low Carbon Growth: A Guide to China's 12th Five Year Plan*. Beijing: The Climate Group.

The Climate Group, 2011b. *China's Clean Revolution IV: Financing China's Low Carbon Growth*. Beijing: The Climate Group.

The Economic Times (June, 2012). 'FDI in India declines 41% to $1.85 bn in April' (website) http://articles.economictimes.indiatimes.com/2012-06-19/news/32317678_1_fdi-inflows-cumulative-fdi-foreign-direct-investment

The Economic Times (March, 2012), Economic Survey 2012: Minimum farm growth needed for inclusive growth and development of rural areas. last accessed on 25.09.2012: http://articles.economictimes.indiatimes.com/2012-03-16/news/31201225_1_inclusive-growth-economic-survey-food-security-act

The Economic Times (March, 2012), Rapid GDP growth- best antidote for poverty, last accessed: http://articles.economictimes.indiatimes.com/2012-03-28/news/31249739_1_poverty-line-india-s-gdp-gdp-growth

The Economic Times (September, 2012). 'Big-bang reforms boost India's economic confidence: Ipsos', last accessed on 25.09.2012: http://economictimes.indiatimes.com/news/economy/indicators/big-bang-reforms-boost-indias-economic-confidence-ipsos/articleshow/16447549.cms

The Economic Times, (April, 2012), India overtakes Japan to become third-largest economy in purchasing power parity, last accessed on 25.09.2012: http://articles.economictimes.indiatimes.com/2012-04-19/news/31367838_1_ppp-terms-india-s-gdp-power-parity

The Economic Times, (June, 2012), India's exports decline by 4.16% in May, last accessed on 25.09.2012: http://articles.economictimes.indiatimes.com/2012-06-14/news/32235746_1_exports-decline-gems-and-jewellery-official-data

The Economic Times. (April, 2012). Government may re-introduce sops for wind farms, Economic Times. Last accessed: September 21, 2012, from http://articles.economictimes.indiatimes.com/2012-04-26/news/31410446_1_generation-based-incentive-wind-energy-wind-farms

The Economist, 2011. Digging holes, A maverick minister lays into a hallowed programme. Accessed online on 27.09.2012: http://www.economist.com/node/21536642

The Economist, 2012. Special report: India, The economy - Express or stopping? 29th September 2012

The Guardian, 2010. Which Bottom Billion, The Guardian, last accessed on 27.09.2012: http://www.guardian.co.uk/global-development/datablog/2010/sep/14/bottom-billion-poverty?cat=global-development&type=article

The Guardian, 2010. Which Bottom Billion. Last accessed on 17.10.2012: http://www.guardian.co.uk/global-development/datablog/2010/sep/14/bottom-billion-poverty?cat=global-development&type=article

The Times of India, 2012. 'Hike in petrol, diesel prices likely after Friday', last accessed on 25.09.2012: http://timesofindia.indiatimes.com/business/india-business/Hike-in-petrol-diesel-prices-likely-after-Friday/articleshow/16251609.cms

The World Bank, Country Data: India (website) http://data.worldbank.org/country/india

Thirteenth Finance Commission, 2009. Thirteenth Finance Commission, Volume I: Report, December, 2009. Government of India.

UN, 2008. State of the world's cities- 2007-08, United Nations Habitat

UNCTAD, 2012. Climate Change and The need for Environmentally Friendly Development. Last accessed on 21.09.2012: http://dgff.unctad.org/chapter4/4.4.html

UNDP (2011). Press Release: India's green economy for the future will need to meet the challenge of adding 8-10 million jobs each year. New Delhi, 3rd June 2011 http://www.undp.org/content/dam/india/docs/india_green_eco_future_need_meet_the_challenge_adding_8_10_million_jobs.pdf

UNDP, 2011. 'India's green economy for the future will need to meet the challenge of adding 8-10 million jobs each year' Press Release, United Nations Development Program.

UNEP, 2009. Global Green New Deal, An Update for the G20 Pittsburgh Summit, United Nations Environment Program

UNEP, 2012. European NGO -Viewpoint on Rio+20 outcomes, Addressed to the Governing Council 2012 – UNEP Nairobi 'Limits to (green) Growth' – revisited. Last accessed on 15.10.2012: http://www.unep.org/civil-society/Portals/59/Documents/Resources/GC_2012_NGO_viewpoint_on_RIO+20.pdf

UNIDO, undated. UNIDO and the Millennium Development Goals, UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION. Last accessed on 25.09.2012: https://www.unido.org/fileadmin/user_media/UNIDO_Header_Site/About/mdgbrochure2.pdf

United Nations, undated. Report of the World Commission on Environment and Development: Our Common Future, Chapter 2. Last accessed on 09 21, 2012: http://www.un-documents.net/ocf-02.htm

Wall Street Journal. 2012. *China's Inequality Gini Out of the Bottle*. [ONLINE] Available at: http://blogs.wsj.com/chinarealtime/2012/09/17/chinas-inequality-gini-out-of-the-bottle/. [Accessed 18 September 12].

Wang X., Li, J.F., Zhang, Y.X., 2010. *An analysis on the short-term sectoral competitiveness impact of carbon tax in China*. Institute for Sustainable Development and International Relations (IDDRI) Idées pour le Débat 03/2010. Paris: IDDRI.

Wang, J. and Wang, M.Y., 2012. Environmental Rule of Law in China: Why the system isn't working. In Keely and Zheng, eds. 2012. *Green China: Chinese insights on environment and development.* London: International Institute for Environment and Development. Ch 11.

Wang, K. 2011. *The Role of Cities in Meeting China's Carbon Intensity Goal*. [ONLINE] Available at: http://insights.wri.org/open-climate-network/2011/09/role-cities-meeting-chinas-carbon-intensity-goal. [Accessed 10 September 12].

Wang, P. and Zhang, X.L., 2010. *Chinese Public Procurement Law: An introductory textbook*. [ONLINE] Available at: http://www.nottingham.ac.uk/pprg/documentsarchive/asialinkmaterials/chinesepublicpocurementlawintroduction.pdf. [Accessed 10 September 12].

WaterAid, undated. The state of Slums in India. Last accessed on 18.10.2012: http://www.wateraid.org/india/what_we_do/7518.asp

Waves, undated. Wealth Accounting and the Valuation of Ecosystem Services. Last accessed on 17.10.2012: http://www.wavespartnership.org/waves/natural-capital-accounting

Weingast, B.R., 1995. The Economic Role of Political Institutions: Market-Preserving Federalism and Economic Growth. *Journal of Law, Economics and Organization*, 11: 1-31.

Whiting, S., 2006. *Growth, Governance, and Institutions: The Internal Institutions of the Party-State in China*. Paper produced for the World Bank Research Project on the Rise of China and India (Governance). Singapore: The Institute of Policy Studies.

World Bank, 2011. World Bank Data on India. Last accessed on 21.09.2012: http://data.worldbank.org/country/india

World Bank, 2011. World Development Indicators. Last accessed on 16.10.2012: http://databank.worldbank.org/databank/download/GDP_PPP.pdf

World Bank, 2012. *China 2030: Building a Modern, Harmonious and Creative High-Income Society*, Washington DC and Beijing: The World Bank and Development Research Center of the State Council, the People's Republic of China.

World Bank,2011. World Bank Report 2011. Last accessed on 25.09.2012: http://siteresources.worldbank.org/EXTWDR2011/Resources/6406082125623901578 1/WDR_2011_Overview.pdf

World Development Indicators (WDI), 2012. [ONLINE] Available at: http://data.worldbank.org/data-catalog/world-development-indicators. [Accessed 21 September 12].

Worrell, E., 2011. *Barriers to energy efficiency: International case studies on successful barrier removal*. Development Policy, Statistics and Research Branch Working Paper 14/2011. Vienna: UNIDO.

WRI, 2010. OVER HEATING Financial Risks from Water Constraints on Power Generation in Asia India, Malaysia, Philippines, Thailand, Vietnam. World Resources Institute and HSBC, April 2010. Last accessed on 17.10.2010: http://pdf.wri.org/over_heating_asia.pdf

Wright,T. and Gupta,H., 2011. India's Boom Bypasses Rural Poor. The Wall Street Journal. Last accessed on 27.09.2012: http://online.wsj.com/article/SB10001424052748704081604576143671902043578.html

Zhang Y., 2012. *Seizing the Opportunity of Green Development in China*. Presentation at Growing Green: The Economic Benefits of Environmental Policies. Ankara 30 May, unpublished.

Zhang, X., 2000. *山西乡镇煤矿发展调查* (in Chinese). 能源基地建设，No 04. [ONLINE] Available at: http://www.cnki.com.cn/Article/CJFDTotal-BUIL200004017.htm [Accessed 21 September 12].

Zheng, Y. and Chen M., 2007. *China's Regional Disparity and Its Policy Responses*. China Policy Institute Briefing Series – Issue 25. [ONLINE] Available at: http://www.nottingham.ac.uk/cpi/documents/briefings/briefing-25-china-regional-disparity.pdf. [Accessed 10 September 12].

Zhou, S., Shi, M., Li, N., and Yuan, Y., 2011. Impacts of Carbon Tax Policy on CO2 Mitigation and Economic Growth in China. *Advances in Climate Change Research,* 2(3): 124-133.

Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
UK
Tel: +44 (0)20 7922 0300
Fax: +44 (0)20 7922 0399
Email: publications@odi.org.uk
Website: www.odi.org.uk
ISBN 9781 909464 03 2
Working Paper (Print) ISSN 1759 2909
ODI Working Papers (Online) ISSN 1759 2917