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Scoping Green Growth Challenges and Opportunities in South Asia

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Preface

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Executive summary

Defining and measuring green growth

Green growth policy is commonly defined in the literature as an integrated policy approach balancing low carbon development, macroeconomic growth, social inclusion, environmental sustainability and climate resilience.

Green growth activities can typically be found across a broad range of sectors, but are most commonly seen clustered in agriculture, forestry, energy, industry, transport and infrastructure planning. Policy mechanisms to promote green growth include regulation, incentives, investments, information, and capacity building.

Measuring green growth impacts presents methodological challenges. Green GDP is a complex indicator with a number of sub-components. The benefits of some elements of green growth (e.g. climate resilience) are only captured in the long term. Others (e.g. natural capital and ecosystem services) pose economic valuation challenges.

Status of green growth initiatives in South Asia

Integrated green growth frameworks are becoming widespread across South Asia. They are generally not explicitly labelled as such, but rather as ‘sustainable development’ or ‘sustainable growth’ strategies, and are formulated as part of wider development and sector planning.

In some respects these policies mark a departure from traditional growth models, with an enhanced focus on competitiveness and resource efficiency. In other respects, they are a continuation of traditional natural resource-based growth models (sustainable agriculture, livelihoods etc.).

All countries have national development frameworks (such as visions and five-year plans) with elements of green growth policy. Some have attempted integrated sustainable development strategies (e.g. Pakistan’s National Sustainable Development Strategy) that discuss economic, environment and social policy.

Climate policies underpin these sustainability objectives. All countries have a range of frameworks including National Adaptation Programmes of Action (NAPAs), Local Adaptation Programmes of Action (LAPAs), National Action Plans, etc. They tend to be generally oriented towards adaptation, while in India they explore also a variety of mitigation options. The implicit mainstreaming of green growth into sector policy is widespread across all countries in the region and tends to be most developed in the energy, agriculture, and forestry sectors.

A number of barriers make green growth policy implementation difficult. These include a variable level of political commitment and of influencing power of ministries responsible for the policy delivery, limited inter-ministerial coordination, and overall low capacity for implementation. These challenges are additional to the potential high up-front/incremental costs of green growth policy, and weaknesses in the evidence base.

The role of non-government stakeholders is recognised as important in the delivery of green growth objectives. At a global level, there is a strong expectation that the private sector will deliver a substantial proportion of the expected finance for both mitigation and adaptation. All of the countries identify a potential role for the private sector in their policies and strategies, whether by encouraging investment (public–private partnerships), providing incentives (e.g. renewable tariffs) or reducing fiscal impacts (e.g. reduced VAT rates for green goods).

Evidence of benefits, costs and trade-offs

The global evidence base on the need for green growth policy is strong, but the evidence base for its effectiveness is relatively weak, particularly in South Asia. This is partly due to the early stage of integrated green growth policy frameworks in the region. There are few examples of best practice in the literature and further work is required on monitoring and evaluation.

At a global level, there is strong alignment between green growth and macroeconomic growth. Evidence indicates that green growth policies will result in higher levels of long-run GDP growth, both from the avoided costs of climate change but also from the development of new sectors. There are likely to be employment, trade and competitiveness benefits. Many green growth activities are centred around resource efficiency, where there are net economic benefits and short payback periods.

However, the timing and distribution of costs and benefits in the short run remains a challenge, particularly for South Asia. The region still has relatively high levels of poverty and low levels of per capita greenhouse gas (GHG) emissions and energy use. It is therefore important that any short-run incremental costs of green investments do not impede overall growth rates. As such, the responsibility for meeting these incremental costs and the availability of finance remain key issues for international negotiation. This is particularly true for capital-intensive sectors (e.g. power), those sectors that have potentially high marginal abatement costs (e.g. sustainable agriculture and transport), and for the additional costs of resilient infrastructure design.

Green growth is likely to support social inclusion where activities are aligned with traditional community-led sectors (e.g. sustainable agriculture), provide access to cost-efficient pro-poor technologies (e.g. solar power, efficiency stoves, etc.) or provide employment opportunities for resilient infrastructure (e.g. digging and maintaining irrigation canals). There can, however, be trade-offs for the poor, for example where subsidies for GHG-intensive inputs are removed (e.g. fossil fuels, power, fertiliser, etc.). In such cases, transition arrangements may be required to offset the impacts on the most vulnerable.

At the global level, there is good evidence of the synergies between low carbon growth and resilience, i.e. green growth reduces impacts and economic costs (and the loss in growth) from avoiding future climate change. However, in the regional context, there is the potential for conflicts as well as synergies between mitigation and resilience. At the structural level, there are potential co-benefits from shifting to less carbon-intensive and less vulnerable sectors. Strong synergies exist in the forestry and agricultural sectors. Potential conflicts exist in the power sector (e.g. shift to climate-vulnerable hydro and biomass) and in urban planning (increases in urban cooling demand).

There are high co-benefits between low carbon elements of green growth (GHG reductions) and the environment, due to the reduction in air, water and waste pollution, as well as the reduced pressures on the natural environment (reduced ecosystem loss or degradation). These have long-term macroeconomic benefits through enhanced natural capital and sustained economic growth, although these will not be recognised in short-term current metrics such as GDP, and in enhancing the economic value of ecosystem services. There are also economic co-benefits from reducing external costs (especially air pollution), although internalising these may affect prices, which may in turn affect investment and competitiveness. Trade-offs include the promotion of monocultures, particularly for biofuel and biomass production.

Lessons from other countries

There is an increasing body of evidence and best practice case studies for green growth in regions outside South Asia. A number of key messages are emerging in terms of the design and delivery of green growth policies, including that integrated and robust planning, analysis, implementation, and monitoring are essential, and that broad support for transformative change is required. However, much more work is required internationally to weigh the timing and distribution of costs and benefits. Ethiopia and Rwanda both offer positive developing country green growth case studies.

Recommendations for further research and capacity

There are a wide range of potential research questions that might be considered. These seek a better understanding of the effects of green growth policy on economic development (GDP, employment and competitiveness), to identify the social and temporal distribution of costs and benefits, to understand the implications of green growth for social safety nets, to clarify the co-benefits and trade-offs between climate resilience and other green growth aspects, and to better understand non-market benefits (ecosystems and biodiversity).

Research capacity in South Asia is relatively strong, with large numbers of institutions working on individual sub-components of green growth (e.g. macroeconomic growth, climate mitigation, etc.). The capacity to address green growth in an interdisciplinary way is less well developed. Nonetheless, there are a number of regional networks that might facilitate research cooperation between countries on core themes.

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List of abbreviations

ADB	Asian Development Bank
AEPC	Alternative Energy Promotion Programme (Nepal)
ANDS	Afghanistan National Development Strategy
BAU	Business As Usual
BCCRF	Bangladesh Climate Change Resilience Fund
BIDS	Bangladesh Institute of Development Studies
CCSAP	Climate Change Strategy and Action Plan (Bangladesh)
CDKN	Climate and Development Knowledge Network
CEDA	Centre for Economic Development and Administration (Nepal)
CPEIR	Climate Public Expenditure and Institutional Review (Bangladesh)
CPRI	Centre for Policy Research India
CSO	Civil Society Organisation
CSR	Corporate Social Responsibility
DFID	Department for International Development
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
HBP	Hariyo Ban Programme (Nepal)
ICIMOD	International Centre for Integrated Mountain Development
IEE	Initial Environmental Examination
IPCC	Intergovernmental Panel on Climate Change
LAPA	Local Adaptation Plan of Action
LDCs	Least Developed Countries
LULUCF	Land Use, Land Use Change and Forestry
MAC	Marginal Abatement Cost
MNRE	Ministry of New and Renewable Energy (India)
MoEF	Ministry of Environment and Forestry (Bangladesh)

MoEFCC	Ministry of Environment, Forests, and Climate Change (India)
MOSTE	Ministry of Science, Technology and the Environment (Nepal)
NAPA	National Adaptation Programme of Action
NAPCC	National Action Plan for Climate Change (India)
NCCP	National Climate Change Policy (Pakistan)
NEPA	National Environmental Protection Agency (Afghanistan)
NGO	Non-Governmental Organisation
NPC	National Planning Commission
NREGA	National Rural Employment Guarantee Act (India)
NSDS	National Sustainable Development Strategy
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OPML	Oxford Policy Management
PPP	Public–Private Partnership
R&D	Research and Development
SAARC	South Asian Association for Regional Cooperation
SANDEE	South Asian Network for Development and Environmental Economics
SAPCC	State Action Plans for Climate Change
SARH	South Asia Research Hub
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNOPS	United Nations Office for Project Services
UNRISD	United Nations Research Institute for Social Development
WWF	World Wildlife Fund

1 Introduction

Green growth is a critical concept for South Asian countries as they need to deliver growth to reduce poverty and support growing populations. While the countries operate in different political and economic contexts, all are sensitive to the potential negative social and environmental impacts of economic growth. The increase in policies addressing these themes suggest that there is a shared understanding that growth needs to be decoupled from natural resource degradation in order to achieve sustainable economic development. There is also an understanding of the economic potential of emerging green sectors. However, green growth is generally not well defined as a concept, and the evidence base for policy formulation also remains weak in the South Asia region.

This report sets out the findings for the project 'Scoping Green Growth Challenges and Opportunities in South Asia'. The study, which focuses on five countries (Afghanistan, Bangladesh, India, Nepal and Pakistan), has as its objectives the assessment of the following:

- The relevance and effectiveness of green growth initiatives in South Asia;
- The current status of regional and national green growth strategies;
- Compatibility with traditional and emerging country growth models;
- Evidence on what works and what does not, and the knowledge gap;
- The challenges and opportunities that green growth poses for poverty reduction in the region; and
- The key institutions carrying out research on green growth in the region.

The research has been carried out in each of the five countries through a blend of desk review of interventions and evidence base, national-level policy screening following the template in Annex B, and validation of findings via stakeholder interviews with key policy-makers, donors, researchers and academics. A final review was undertaken to cross-reference the findings between the various research streams.

The report is structured as follows:

- Section 2 reviews definitions of green growth and sets out green growth activities;
- Section 3 explores the status of green growth initiatives in the South Asia region;
- Section 4 provides an overview of the evidence for green growth benefits, costs and trade-offs;
- Section 5 summarises best practice lessons from outside South Asia;
- Section 6 outlines questions for further research and highlights major research institutions;
- Annex A contains the list of stakeholders consulted and strategies, policies and laws reviewed. Annex B gives the thematic questions for the research, Annex C the template for policy screening and Annex D detailed analysis on each country. Finally, Annex E is a summary of the main green growth-related policies.

2 Defining and measuring green growth

This section explores emerging international definitions of green growth and sets out typical activities and related policies by sector. Issues associated with measurement and monitoring of the sub-components of green growth are also explored.

2.1 Emerging definitions of green growth

'Green growth' has existed as a concept for more than 30 years.[1] However, it has become more prevalent as a theory over the last decade, in particular with growing concerns about the food–energy–water–climate nexus and the rise in world food and energy prices.

The term broadly implies alignment between development, environmental and social improvement. However, there are various definitions of 'green growth' in current usage:[2]

- United Nations Environment Programme (UNEP): growth that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities (UNEP, 2011);

- United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP):[3] growth that emphasises environmentally sustainable economic progress to foster low carbon, socially inclusive development;

- Organisation for Economic Co-operation and Development (OECD): fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our wellbeing relies (OECD, 2011);

- World Bank: growth that is efficient in its use of natural resources, clean in that it minimises pollution and environmental impacts, and resilient in that it accounts for natural hazards and the role of environmental management and natural capital in preventing physical disasters (World Bank, 2012);

- Green Growth Best Practice Initiative: Growth that can achieve poverty reduction, environmental protection, resource efficiency and economic growth in an integrated way (GGGI, 2014).

In addition, the Intergovernmental Panel on Climate Change (IPCC) is undertaking work on a number of areas related to green growth policy. The Working Group III report by the IPCC Summary for Policy-Makers was published in April 2014 and sets out the linkages between GHG mitigation scenarios and sustainable development. A number of ongoing initiatives are further reviewing and developing green growth concepts, thus improving the evidence base. These include the Global Commission on the Economy and Climate.[4]

From the above literature we identify a number of key themes that form a core definition of green growth:

[1] E.g. the Brunt land Report in 1987, the Rio Summit in 1992 and the 'correction' of national accounts to take into account loss of natural resources.
[2] For sources and a history of green growth, see http://sustainabledevelopment.un.org/index.php?menu=1447
[3] See http://www.greengrowth.org/?q=static-page/sat-10012011-1104/about-green-growth
[4] The report is due in September 2014.

- A focus on *low carbon development*, particularly on the reduction of emissions associated with economic development, and an objective to lower the GHG intensity of the economy;

- A commitment that growth should be *socially inclusive*, therefore ensuring that its benefits can play a role in poverty reduction through livelihoods and job creation;

- An understanding that *macroeconomic development and sustainability* are aligned over the longer term (in relation to national planning frameworks out to 2025–2030 and beyond), even if there may be short-term trade-offs;

- An acceptance that the impacts of climate change and natural resource depletion threaten long-term growth, and must be addressed through *improved climate resilience and mitigation efforts*;

- A recognition that there may be some *trade-offs* between the above policy objectives, so the timing and distribution of costs and benefits will need to be carefully considered in policy development.

In practice, pursuing green growth implies adopting a planning approach that shifts public and private expenditure and policy-making from 'business as usual' (BAU) toward a green economy path, maximising the areas of co-benefits between the above policy objectives, and ensuring that any potential costs are understood and addressed where appropriate.

2.2 Green growth activities

As set out above, the green growth concept is multi-faceted. It can cover a range of sector policies and activities. These include technical measures (e.g. capital investment in green technologies), non-technical measures (e.g. awareness raising and behavioural change) and broader economic planning approaches.

Planning for green growth may generally involve the following economic sectors (UNDESA, 2012; IBRD, 2009; team analysis):

- *Land use, land use change and forestry (LULUCF):* Green growth seeks to promote sustainable forestry for both its mitigation and adaptation benefits, and to recognise the value of ecosystem services. Benefits can include the total economic value provided by natural systems, including the provision of food and timber-supporting services such as nutrient recycling, regulatory services including flood protection, biodiversity, and recreational and cultural services, including tourism. Policy responses might include regulation (and enforcement), as well as public investment.

- *Extractive industries:* Green growth seeks to ensure that the exploitation of natural resources such as oil, gas, metals, and minerals is done in a sustainable way, while ensuring that the benefits are shared equitably. As well as having a major impact on GHG emissions, the extractive industries can result in significant localised environmental impacts. A green growth policy approach enforces environmental regulations and introduces the concept of ecosystem services in order to weigh the value of minerals against the costs of their extraction, environmental degradation and habitat loss. It also ensures that rates of extraction are managed, and that asset owners are not able to engage in rent seeking.

- *Agriculture*: Green growth may seek to exploit the potential for reducing GHG emissions from agriculture, while providing adaptive solutions to the sector. In fact, agriculture

represents a high source of GHG emissions in many Least Developed Countries (LDCs), and sustainable agriculture techniques (such as soil and water conservation and agroforestry) are important for adaptation. They also potentially carry mitigation co-benefits. A green growth approach may involve selecting new climate-resilient crops and practices, increasing investment in irrigation, and improving water and soil management, thereby supporting and enhancing local livelihoods. Many of these measures address an existing climate-adaptation deficit, but require a period of time to deliver benefits.

- *Energy:* Green growth programmes will often have a focus on energy efficiency and renewable energy support, as well as on removing fossil fuel subsidies. While energy efficiency programmes tend to deliver strong financial returns and rapid payback periods, renewable energy systems will normally carry higher marginal costs than their fossil fuel equivalents (with the exception of large hydro, geothermal or remote off-grid locations using expensive diesel generators[5]). For example, the levelised cost of energy for solar photovoltaic technologies in India is estimated between USD$87 to 137/MWh and solar thermal between USD$123 and 248/MWh (World Energy Council, 2013). The levelised cost of energy for coal and gas remain significantly lower, despite abundant solar resources. Using domestic coal prices, generation costs can be as low as USD$69/MWh. Where there are higher costs, these may be offset by government policies, including fiscal incentives and feed-in tariffs. For example, in India, initial solar market developments were based on fixed feed-in tariff schemes such as the Generation Based Incentive and the Small Solar Power Generation Programme by Ministry of New and Renewable Energy (MNRE). These were followed by projects at the Jawaharlal Nehru National Solar Mission at defined tariffs. Policies increasing the costs of large-scale power are often important but are politically difficult, given the perception that economic growth is linked to low-cost energy. Policies that aim at incentivising low carbon energy, such as hydropower, may also carry potentially high localised environmental and social costs, so the trade-offs need to be carefully considered.

- *Industry*. Efficiency of resource use (e.g. water and energy) is a major focus of green growth policies. In practice, this can be achieved through green taxation policies that have an impact on the private sector, following a 'polluter pays' principle to reduce waste and lower GHG emissions. Awareness around the potential commercial benefits of resource efficiency can also be promoted, particularly where these measures have rapid payback periods. Policies on promoting domestic value-added are important, encouraging a shift in industrial production away from basic energy and resource-intensive sectors toward less knowledge-based services.

- *Transport, infrastructure and spatial/urban planning*. There are a range of motivations for developing policies in these sectors – for example, public transport investment may be motivated by congestion and air pollution. However, these sectors are often dependent on state or parastatal financing, as they are mostly public goods. They may face opposition from consumers (e.g. the rise of car ownership can create a strong political focus on investment in road transport infrastructure rather than in public transport alternatives). The private sector may lack incentives to invest. Policies generally involve public investment, and can include improving the resilience of urban infrastructure through the use of more robust design standards, and the better use of climate data in spatial planning. It is important to avoid the potential GHG emissions and climate vulnerability lock-in associated

[5] McKinsey & Company (2009) developed the 'Marginal Abatement Cost Curve', which is currently the most used reference for understanding mitigation costs.

with long-term infrastructure, recognising that the costs of retrofit or upgrade once in place may be prohibitive.

- *Education and health*. The economic benefits of education and health are often neglected, which is also true in relation to green growth. Both have the potential to underpin positive economic outcomes by addressing climate-sensitive factors (such as the higher burden of climate-sensitive diseases) that can act as a drag on growth. Policies include investment in research and development (R&D) and the promotion of climate change and sustainable practices awareness through school curricula.

UNDESA (2013) sets out a range of cross-sector policy measures that are conducive to green growth. As detailed in Table 1 below, these measures are divided into 'six Is': Internalising, incentivising, institutions, investment, information, and inclusion.

Table 1: Policy approaches for green growth

Policy category ('six Is')	Policy sub-categories
Internalising (externalities)	1. Taxes, charges, fees, levies on 'bads' (i.e. pollution, resource use or proxy) 2. Cap and trade permit or certificate systems
Incentivising	3. Investment incentives – low interest loans, micro financing, tax exemptions 4. Subsidies, feed-in tariffs and other direct support for goods 5. Removing policy-induced distortions and perverse incentives (i.e. harmful subsidies) 6. Leveraging finance – Public–Private Partnership (PPPs), long-term guarantees, phased out support, removal of barriers to foreign direct investment, low administrative burden, credit guarantees
Institutions	7. Regulations – norms, standards, information disclosure, labelling, prohibitions, fines and enforcement, mandatory targets 8. Property right and access right laws 9. Governance and institutional capacities – accountability, transparency, enforcement of anti-corruption
Investment (in natural capital, agriculture, human capital, infrastructure and innovation)	10. Investment in public procurement 11. Investment in natural capital – Payments for Ecosystem Services (PES), protected areas, direct management, and rehabilitation 12. Investment in sustainable agriculture 13. Investment in human capital – capacity building, training, skills 14. Investment in infrastructure – energy, water, transport, waste, ICT 15. Investment in innovation – R&D, deployment, information sharing
Information	16. Voluntary approaches – information provision, labelling, corporate social responsibility (CSR), targets, agreements, educational initiatives 17. Measuring progress – green accounting, green targets and indicators, carbon inventories
Inclusion	18. Labour market policies – skills (re)training, job search assistance, income support and benefits 19. Social protection floors – unemployment insurance and pensions, cash transfers, compensation for price increases, healthcare

Source: UNDESA, 2013

We have used this table to guide the policy screening in each country.

2.3 Implications for appraisal and measurement

Given the range of definitions and the wide variety of models that seek to integrate social equity and the environment into economic growth, a number of challenges arise in relation to measuring and appraising the effectiveness of green growth measures (UNDP, 2012; Forum for the Future, 2014; team analysis), including:

- *Closing the 'Green Growth Gap'.* Governments may seek to minimise the loss, damage and degradation of natural resources that are not accounted for in conventional gross domestic product (GDP). From a technical perspective, deriving the economic value of non-renewable resources and ecosystems, in addition to setting a benchmark for expected green GDP growth rates, is not easy, although there is a rapidly growing literature on potential methodologies. One example is the 'five capitals approach', which seeks to measure human, social and natural capital, alongside financial and manufactured capital (Forum for the Future, 2014). Another is around the valuation of ecosystem services.[6] The real challenge in introducing green GDP reporting is instead political, particularly when green growth rates may be projected to be lower than conventional ones in the short run.

- *Identifying green growth budget flows.* Green growth activities are often not standalone programmes with dedicated finance but are rather mainstreamed into existing strategies through sector budgets. The identification of these flows is therefore challenging. Assessments by UNDP in Asia, for example, indicate that up to 17% of government budgets are already dedicated to climate change-relevant activities, even if they are not explicitly labelled as such (UNDP, 2012[7]).

Understanding climate-sensitive spending in national budgets

Using the Climate Public Expenditure and Institutional Reviews (CPEIR) study, the United Nations Development Programme (UNDP) and the Overseas Development Institute (ODI) undertook a review of the climate-sensitive activities across the national budget for the Government of Bangladesh. This involved assessing whether activities were highly relevant or relevant to addressing climate change mitigation or adaptation. Based on the methodology, it was estimated that the Government of Bangladesh spends between 6% and 7% of its annual budget on climate-sensitive activity, equivalent to around $US 1 billion. These resources were primarily from the domestic revenues and taxation (77%), but a significant proportion were financed by foreign donors (23%). The value of the specialised climate finance structures and programmes (e.g. the Bangladesh Climate Change Resilience Fund (CCRF) and the Pilot Project for Climate Resilience (PPCR)) only constituted 5% of overall climate spending.

Source: ODI/UNDP 2011

- *Choice of discount rate.* Green growth approaches should lead to adjustments in evidence-based policy appraisal, taking into account longer-term perspectives (for example, out to 2050 and beyond), valuing natural resources and considering the impact of climate change. A key necessity in shifting to a long-term perspective is to use a lower discount rate in public policy appraisal.[8] In the Stern Review, the discounting approach adopted (and the use of lower discount rates where irreversible intergenerational wealth transfers are

[6] See the EU Guidance note at http://ec.europa.eu/environment/nature/biodiversity/economics/pdf/EU%20Valuation.pdf
[7] UNDP have been working on Climate Public Expenditure and Institutional Reviews (CPEIR) in a number of countries with the aim of identifying climate change flows in the country budgets. The methodology for the CPEIRs has evolved during the pilot studies, but has been based on analysis of expenditures for mitigation and adaptation, following the most used definitions.
[8] Most developed country governments are already using low discount rates (<5%). The UK recommends declining rates are used for long-term costs/benefits, although these only decline modestly, i.e. from 3.5% to 3.0% for years 31–75 and 2.5% for years 76–125.

involved, such as for climate change) still discounts for growth (reducing only the pure rate of time preference). The result is the continued use of high discounting rates, especially in developing countries. While some developing countries argue that capital is scarcer and the opportunity cost is higher, high discount rates tend to accentuate the short-term opportunity costs of capital against the benefits of longer-term perspectives.

- *Use of cost–benefit methodologies.* The use of economic analysis is increasingly common for major evidence-based appraisal of policies and investments, although such an approach has a number of limitations, and therefore needs to be used with caution. For mitigation, the Marginal Abatement Cost (MAC) curve provides a strong tool for prioritising the most cost-effective policies. However, MAC curves generally do not include transaction costs (as they are technology focused) and do not consider wider social costs or benefits. These factors need to be considered when using them for policy-making purposes. For adaptation, similar cost curves have been developed based on cost–benefit ratios and the volume of required investment. However, these approaches are based on translating the approach used for mitigation to adaptation. The adaptation literature argues that this is highly inappropriate, due to the highly location-specific costs and benefits of adaptation responses, rather than the more uniform and generic costs of mitigation technologies. The IPCC 5th Assessment Report suggests a move towards iterative risk management approaches, rather than a purely cost–benefit-based approach.

- *Social inclusion and poverty reduction:* In general, the measurement of social and poverty benefits should involve ex-ante simulations of the distributional impacts of a certain policy on poverty rates. This could be linked to employment opportunities, number of work days provided under a public work programme, reduced costs for fuels after adoption of most efficient technologies, higher agricultural productivity, etc. Other metrics might include the health impacts of the use of more efficient technologies (for example, on indoor air pollution, respiratory diseases, etc.) and indicators of how certain policies disproportionally affect women and children.

- *Climate resilience:* There are major challenges in developing indicators for resilience because of the long life-times of climate change (which are beyond normal evaluation time-scales) and the difficulty in assessing any measured changes against the background of high natural climate variability. For this reason, indicators tend to focus on whether or not climate impacts and adaptation have been built into growth strategies and other policies. Other indicators focus on the monitoring of natural hazard impacts to establish baselines and overall risk exposure, and to help target resilience policies. A report by ODI (2013) explores the link between poverty and natural hazards (including climate) and has analysed response capacity in the South Asia region among others. While noting the significant overlay between poverty and climate risk across all the five countries reviewed in this report, it nonetheless identified that India has the highest levels of capacity to respond to these risks (although capacity is highly variable by state).

- *Environmental sustainability:* There are existing indicator sets that can be used to assess the key benefits of green growth policies, such as air emissions inventories and air pollution concentration monitoring. One of the key benefits will be reduced air pollution. Similar metrics also exist for water quality and levels of waste generated and disposed of. For ecosystems, indicator sets include the extent and state of natural ecosystems (e.g. deforestation and degradation rates, the extent of protected areas, and plant and animal species monitoring). These would again allow the evaluation of whether green growth policies deliver benefits to biodiversity and other ecosystem services. However, in most cases there will be multiple factors that affect the changes in environmental quality (i.e. the

state of the environment) over time, and in many cases the ex-post attribution of changes to specific policies is difficult. This may therefore necessitate a more targeted set of environmental indicators (e.g. sector-specific ones) that align to the exact green growth policies introduced.

3 Status of green growth initiatives in South Asia

In this section we draw together the main findings in regard to the development and implementation of green growth policies in the region and their divergence from traditional growth patterns. The chapter draws extensively upon the policy review and stakeholder interviews, while the details for each country are provided in Annex D.

3.1 Traditional growth patterns

South Asian countries share a common economic and social history. The largest (India, Pakistan and Bangladesh) shared a common market and integrated monetary system until 1947. India dominates the others, with approximately 80% of GDP, with Pakistan about 10%, Bangladesh 6% and other countries less than 4% (IMF, 2012). Countries in the region have enjoyed relatively high levels of economic growth over the last few decades, and many have embraced elements of market and trade liberalisation along OECD models. For example, major reforms in India in 1991 promoted liberalisation of trade, resulting in significant increases in exports, imports, and foreign direct investment.

There are a number of common elements of economic growth patterns that can be identified:

- *A policy of self-sufficiency:* Countries in the region have tended to promote the concept of protectionism and self-sufficiency through the use of high tariffs and other trade barriers, and a highly controlled capital account. This, together with poor infrastructure and a lack of competitive advantage between countries, has resulted in lower levels of regional trade integration than in other parts of the world (IMF, 2012). There are inter-state tariffs in India as well. One result is that trade is not used as a solution to localised food deficits arising from poor harvests or climatic stresses.

- *The promotion of labour-intensive sectors:* Countries have generally sought to support social inclusion and poverty reduction through the promotion of labour-intensive sectors (e.g. smallholder agriculture), often at the expense of economic efficiency. In India, the government has provided support to small employers over many decades (e.g. tax concessions, access to credit, subsidised interest rates, procurement advantages, exclusive rights, etc. (IMF, 2012)).

- *Low-cost, low value-added:* Growth strategies in the region have often focused on low-cost production, exploiting the relatively cheap cost of labour in South Asia. Examples include the textile industries in Bangladesh and Pakistan. Competing on quality and value-added has traditionally not been a strength in the region, particularly as domestic industries have been shielded from international competition.

- *Weak environmental planning and regulation:* A large informal sector and weak enforcement of environmental regulations have often allowed growth to develop at the expense of natural resource sustainability. For example, water basins across South Asia are being increasingly overused, polluted and salinised. Agricultural policy has also taken its toll on soil fertility. This change has been induced through a range of input subsidies (e.g. in relation to machinery, chemical fertiliser, water, electricity and diesel) and price support mechanisms (minimum support prices and public procurement), which have heavily favoured mechanised, irrigated production of imported varieties of rice and wheat (Milham et al., 2011).

- *Dominant role of the state:* Governments have traditionally played an active role in economic development, with high levels of state control and involvement in key industries. In India, where the private sector was allowed to develop, this was controlled by licensing and quota systems. More resource-efficient private sector providers were often excluded from large sectors of the economy regarded as strategic.

Growth rates in the region are relatively robust and expected to remain strong. Indian growth rates are expected to remain within the 5.5–6.5% range going forward. Pakistan has also delivered growth rates above 4% and the Nepalese and Bangladeshi economies continue to grow (ADB, 2014a). However, per capita growth rates are lower (reflecting the rapid growth in population), with no country exceeding 5%.

Table 2: Per capita growth rates (% per annum)

	2009	2010	2011	2012	2013
Afghanistan	18.1	5.8	3.5	11.7	1.8
Bangladesh	4.7	4.9	5.5	5	4.7
India	7.1	8.8	5.3	3.4	3.7
Pakistan	1	-0.2	1	2.3	4.3
Nepal	3.4	3.6	2.2	3.6	2.6

Source, WDI, World Bank, OECD data

Going forward, many of the drivers of growth will remain. For example, India is expected to add between 80 and 110 million people to the labour force between 2010 and 2020 (Goldman Sachs, 2010).

From an emissions and energy perspective, countries demonstrate a wide range of development paths, as illustrated in Table 3 below.

Table 3: Energy and emissions profile of South Asia (2011 data)

Country	GDP per capita (million US$ (2005) per capita)	Energy use per capita (000s tonnes oil eq. (ktoe) per capita)	Electricity/ heat (CO2) per capita (tCO2 per capita)	Total GHG emissions Incl. LULUCF per capita (tCO_2e Per capita)	Total GHG emissions incl. LULUCF per GDP (tCO_2e / m $ GDP)	Energy emissions per GDP (tCO2e / million US$ GDP)	Energy use per GDP (000s tonnes oil eq. (ktoe) per GDP)
Afghanistan	373	na	na	0.87	513	na	na
Bangladesh	568	205	0.16	1.05	465	165	90,913
India	1,086	614	0.789	1.93	395	321	125,683
Nepal	384	383	0	1.6	779	193	186,123
Pakistan	755	482	0.23	1.87	440	208	112,969

Source: Cait 2.0

Energy use and associated CO_2 emissions per capita are significantly higher in India than in other countries. This reflects a higher level of economic development (GDP per capita is approximately two to three times that in neighbouring countries), but also the high level of fossil fuel (and particularly coal) use in the power sector. Consequently, the energy sector emissions intensity of the economy (on a per unit of GDP basis) is also higher than in other countries.

The emissions intensity of the regional economies (total GHG emissions including LULUCF per unit of GDP) are higher across the region than the United Nations Framework Convention on Climate Change (UNFCCC) Annex 1 benchmark (360 tco2e/million $ GDP) and significantly higher than in some developed regions (e.g. 252 tCO_2e/million $ GDP).[9]

3.2 Regional definitions of green growth

None of the governments reviewed had explicitly defined or adopted the concept of ‘green growth’ in their own policies or strategies. However, the components of green growth can be clearly identified in national policy documents. Common themes include combinations of some or all of the following: low carbon development, macroeconomic growth, social inclusion/poverty reduction, climate resilience and environmental sustainability.

For example, India pursues ‘sustainable growth’ as a policy concept, which includes both social inclusion and environmental sustainability. Likewise, Pakistan pursues a policy of ‘sustainable development’, which integrates environmental, social and resilience issues into socioeconomic development. All countries have elements of green growth policy embedded in their national development strategies, supported by a range of climate change and environmental policies. These are explored in more detail in section 3.4.

3.3 Green growth institutions

Most of the governments operate green growth strategies through a combination of development planning institutions (e.g. planning commissions) and climate change and environmental institutions bodies (e.g. ministries of the environment). In some cases, these institutions combine for the purposes of policy formation and coordination to form sustainable development planning committees or commissions (e.g. Bangladesh’s National Environment Council and Nepal’s Climate Change Council). Mainstreaming tends to remain the responsibility of the individual line ministries,

[9] CAIT 2.0 2011 data.

supported by the Ministry of Environment or equivalent. Some countries (e.g. Bangladesh and India) have set up state and local-level sustainable development and climate change structures. Details of the national-level institutions are set out below:

- Afghanistan's growth strategy is driven directly by the president through an oversight committee taking in the relevant sector ministries. The National Environmental Protection Agency (NEPA) takes the primary role in climate change and environment-related policy.

- Bangladesh's growth strategy is formulated by the Planning Commission. The National Environmental Council is a cross-sector body headed by Ministry of Environment and Forestry (MoEF), which coordinates sustainable development within the growth strategy.

- India's growth strategy is managed by the Planning Commission, with environment policy the responsibility of the Ministry of Environment, Forests, and Climate Change (MoEFCC). The Prime Minister's Council on Climate Change implements climate policy, supported by MoEFCC. The Pollution Control Board under the MoEFCC and the Supreme Court Green Bench also play a role in monitoring and enforcing environmental laws.

- Nepal's growth policy is set by the National Planning Commission. The Ministry of Science, Technology and the Environment (MOSTE) is the focal point for climate and environment. The Climate Change Council was convened in 2009 to coordinate cross-sector policy.

- Pakistan's growth policy is formulated by the Planning Commission. Climate change policy is coordinated by the Climate Change Division (under the Cabinet Secretariat) and the Prime Minister's Committee on Climate Change.

3.4 Green growth policies

3.4.1 Macroeconomic development strategies

Across all of the countries in the region, elements of green growth are explicitly addressed in medium- and long-term economic development frameworks, such as 'vision' documents and five-year plans. In some countries, an explicit 'green growth' strategy has been produced (e.g. the Bangladesh National Planning Commission (NPC) National Sustainable Development Strategy (NSDS)), but these documents tend to collate existing policy and programme elements rather than setting out a strategic direction for socioeconomic development. Some state-level institutions have also developed specific green growth policies (e.g. the Khyber Pakhtunkhwa Green Growth Initiative in Pakistan). Only in Afghanistan is sustainable growth not explicitly considered in the national development strategy. More detail is set out below:

- In Afghanistan, growth policy is set out in the Afghanistan National Development Strategy (ANDS) 2008–2013. The ANDS contains a number of elements of green growth (e.g. social and natural resource conservation, environmental compliance, etc.) but sustainability is not an explicit objective. Key sectors in the ANDS include forest conservation, natural resources and water management. The ANDS mandates environmental screening and accounting for externalities in policy appraisal.

- In Bangladesh, growth policy is framed in the 6th Five-Year Plan (2011–2014) and the Perspective Plan Bangladesh (2010–2021). Both have green growth elements. The Plan seeks to introduce poverty, climate and environment into development planning processes. Chapter 13 of the Perspective Plan sets out the environmental strategy, focusing on coastal

zone management and afforestation. The NPC has also prepared a NSDS, which sets out a national green growth strategy.

- In India, the sustainable growth concept makes up a large part of the 12th Plan document, which acts as a core funding and planning mechanism for both national and state policy. The 12th Plan document subtitle is 'Faster, Sustainable and More Inclusive Growth'. Green growth themes include food and energy security, sustainable agriculture, waste management, resource efficiency, clean energy access, sustainable water provision, sustainable transport and green housing.

- In Nepal, growth policy is set out in the Three-Year Plan and the associated approach papers prepared by the NPC. The Plan emphasises 'climate-compatible' development, and sustainable agriculture, forest management, environmental conservation and pollution control as key themes. Climate adaptation is a core objective, with issues such as drought-resilient crop varieties and year-round irrigation identified as a core focus.

- In Pakistan, green growth has been mainstreamed into the 10th Five-Year Plan and the Vision 2030 document, which represent the main economic planning frameworks. Vision 2030 has a strong focus on both adaptation and mitigation. Forestry, renewable energy, environmental protection and resource efficiency are key themes. Furthermore, the Five-Year Plan sets out a range of fiscal incentives for green approaches.

3.4.2 Climate change and environment policies

All countries in the region have climate change strategies, policies and laws that support elements of green growth. For example, Afghanistan, Bangladesh and Nepal have NAPAs, India has developed the National Action Plan on Climate Change (NAPCC), and Pakistan has the National Climate Change Policy (NCCP). Some countries in the region have subnational plans (LAPAs in Nepal, State Action Plans on Climate Change in India, etc.). However, climate policies are often prepared in isolation from economic development plans, and therefore may suffer from a lack of alignment. Further details of the national-level initiatives are set out below:

- In Afghanistan, there is no climate change policy per se. Instead, climate and environment are governed by the Environment Law (2005), the National Adaptation Plan of Action (2009), the First National Communication to the UNFCCC (2013) and the Strategic National Action Plan for Disaster Risk Reduction (2010). None of these are well integrated into the national development planning framework. Key areas of policy interest include sustainable water and land management.

- In Bangladesh, the Climate Change Strategy and Action Plan (CCSAP) (2009), together with the NAPA, is the core climate change planning framework. These draw on the NSDS (2008), which brought together elements of a green growth approach in a 2030 vision. CCSAP is mainly adaptation focused and costed at US$ 5.5 billion over the first seven years of implementation. Activities cover a range of green growth themes, including establishing the macroeconomic implications of climate change and the potential for social safety nets. Dedicated climate funds have been established as a result.

- In India, climate change policy is governed by the NAPCC (2008). The NAPCC sets out eight thematic missions, all of which have green growth implications (e.g. energy efficiency, solar, sustainable agriculture, etc.). There are a number of targeted regulations (e.g. energy and water efficiency standards) and incentives (e.g. credit schemes and insurance for sustainable agriculture). Social protection is not addressed as part of the NAPCC, although

the National Rural Employment Guarantee Act (NREGA) 2005 was cited in the Second National Communication to the UNFCCC. The macroeconomic implications are also not explicitly measured. Other relevant policies include the National Forest Policy (1988), the National Environment Policy (2006), the Air Act (1981) and the Water Act (1974). Biodiversity is supported through the Biological Diversity Act (2002) and the Environment (Protection) Act (1986).

- In Nepal, climate change policy is currently enabled by the Climate Resilient Planning Framework (2013), the Climate Change Policy (2011) and the Climate Budget Code. The Framework seeks to mainstream adaptation (and mitigation co-benefits) into national planning processes. The Policy supports the mobilisation of finance through a climate fund and carbon trading, sets out a range of mitigation and adaptation measures and supports capacity building and social inclusion. Nepal has mainstreamed a climate coding system into its budget framework to track climate-relevant expenditure and support planning.

- In Pakistan, growth plans are supported by the NSDS (2012) and the NCCP (2012). The NSDS attempts to set out an integrated growth model that addresses economic development, social development and environmental sustainability. The NCCP seeks to support the development goals set out in the Planning Commission's Vision 2030 document, primarily through resilience measures (agriculture, forestry, coastal zones, biodiversity and ecosystems). Mitigation elements are also discussed (e.g. carbon taxes).

3.4.3 Sector policies

In many cases, sustainable national development strategies, supported by climate and environment policies, have enabled the mainstreaming of green growth into key sectors. Mainstreaming tends to be most developed in the energy sector (low carbon power generation), agriculture (sustainable, resilient agriculture), and forestry (sustainable forest management, REDD+). Details on national-level mainstreaming are given below:

- In Afghanistan, selected sector strategies include some elements of green growth, but it is not clear to what extent the ANDS or policy objectives in the First National Communication to the UNFCCC have as yet been fully mainstreamed. The energy sector is pursuing opportunities for solar and hydropower development. The Afghanistan Agriculture Master Plan proposes some elements that support natural resource development (e.g. afforestation, watershed rehabilitation, nursery development, and land reform).

- In Bangladesh, there is some government-level support for the development of renewable energy, water management and pollution control. However, stakeholders indicated that GHG mitigation initiatives are not well integrated with wider economic policies. As a result, the Asian Development Bank (ADB) is currently working to develop a holistic framework for climate change mitigation.[10] There has been a conscious (albeit limited) linking of the NAPA and the Poverty Reduction Strategy Paper in Bangladesh.

- In India, the NAPCC is being operationalised through a number of sector-focused missions. For example, under its Green India Mission, the government envisages a total investment of INR 46,000 crore (approx. US$ 7.6 billion) for forest conservation and reforestation projects with the aim of revitalising more than 10 million hectares of degraded forest area by 2020.[11] Under the National Mission for Enhanced Energy Efficiency in Industry, a number of fiscal policies are being developed, including the reduction of subsidies to the

[10] See www.adb.org/projects/44305-012/details
[11] See www.naeb.nic.in/documents/GIM_Brochure_26March.pdf

fertiliser production industry, accelerated depreciation for energy efficiency equipment, and tax incentives for energy efficiency-labelled equipment. In addition, the National Clean Energy Fund has been financed through a tax on coal mined or imported to the country, and there are a number of other policies outside the NAPCC, such as the Policy on Hydropower Development (2008).

- In Nepal, the NPC issues an annual planning circular to line ministries to promote climate change programming. Some sectors have a higher level of green growth mainstreaming than others. For example, the forestry, agriculture and water/hydro sectors have relatively strong mainstreaming approaches. Other sector policies (e.g. industry, transportation and infrastructure) are less developed. Policy-makers have also adopted green growth approaches at a local level through a number of district forestry, climate and energy action plans.

- In Pakistan, a number of sector policies promote green growth objectives. For example, the National Forest Policy (2010) recognises the potential for reforestation as a carbon sequestration strategy and promotes watershed protection, forest livelihoods and soil erosion reduction. The Renewable Energy Technologies Act (2010) sets up the institutional framework for the promotion of solar photovoltaic, thermal, hydrogen, biogas, hydro and wind technologies. Green growth objectives have also been adopted at a provincial level (e.g. Khyber Pakhtunkhwa Green Growth Initiative).

3.5 Political economy and institutional barriers

Political, institutional and vested interests prevent the implementation of policy reform. Without an in-depth understanding of political economy, any technical solutions are unlikely to be accepted and embedded in policy reality. It is therefore important to understand the incentives frameworks driving different stakeholders, which affect the power relationships and distribution of resources between them.

Impact can be achieved only if three elements for creating reform space are present: authority, ability and acceptance.

This involves:

1. Winning the support of the high-level stakeholders that have the authority to initiate change;
2. Having organisational units with the technical ability to implement the reforms effectively; and
3. Securing acceptance of the changes by the institutions responsible for their implementation.

Political economy of green growth in Pakistan and Nepal

Recent studies by International Alert set out an analysis of the political economy of climate change in Pakistan and Nepal.

In Pakistan, the reports identified a lack of interest among federal government policy-makers in climate change issues. The devolution of responsibility for environmental issues in April 2011 has created a number of problems in terms of capacity and willingness to engage on environmental policies, in particular funds and conventions. Another issue identified is the lack of an institutional set-up to implement various policy measures outlined in the NCCP, and the fact that it was framed without extensive stakeholder consultation. At a local level, the report identifies poor linkages between federal and provincial governance systems, the elite capture of resources, the politicisation of technical roles and the nature and practice of foreign aid delivery.

In Nepal, the study identified a national preoccupation with post-conflict state building and governance that detracted from focusing upon climate- or environment-related issues. The report highlights poor coordination between the centre and districts, with a high level of politicisation over aid. Flows associated with climate change are susceptible to capture by the political elites at a local level. Concerns were also raised about local capacity to manage projects at the district level (approximately 80% of resources are committed for implementation locally), although LAPAs are being implemented to address this. Robust financial management systems also remain an issue.

Source: International Alert (2013a, 2013b)

These three factors intersect to create the 'space' for reform and the extent of this space determines the extent of reform that is possible.

Based on desk review and on discussions with stakeholders across the five countries, we have identified a set of potential barriers to the formulation and delivery of effective green growth policy:[12]

- *A lack of commitment to green growth:* Stakeholders indicated that green growth is still largely regarded as a (peripheral) climate and environment issue by many planning and sector ministries. There are doubts about the commitment of policy-makers not to trade-off longer-term sustainability against short-term economic opportunities. A lack of willingness and incentives among the executive has been identified as a key issue in India.[13] As an example of a lack of political support, respondents in Pakistan noted that the Ministry of Climate Change was downgraded to a department in 2013. Some respondents indicated that green growth-related activities were part of a donor-driven agenda.
- *A lack of influencing power:* While some sustainability and climate change concerns have been mainstreamed into key national development plans, ministries of the environment or social development (which tend to own the non-growth components of the green agenda) lack the convening and influencing power with sector and planning ministries to encourage and support the mainstreaming process. In India, this may reflect the absence of specific climate change laws. Green growth is primarily driven by sectoral regulations and acts (e.g. the Energy Conservation Act (2001, 2010), Electricity Act (2003), etc.). This may influence the relatively low budget allocation and limit the influencing powers of the MoEF.
- *Weak inter-ministerial coordination*: While affecting a wider policy agenda than just green growth, many respondents identified a silo-based approach to policy-making and programme development as a constraint (particularly around topics with a cross-sectoral overlap such as agriculture, water, energy and forestry). Weak inter-ministerial coordination and cooperation is particularly problematic for the green growth concept, given its interdisciplinary nature (economic growth, social development, environmental

[12] The full list of stakeholders interviewed can be found in Annex A
[13] Also in Divan and Rosencranz (2002).

sustainability) and need for integrated policy solutions. Responsibilities for implementation of the green growth agenda remain fragmented across the region.

- *Limited implementation capacity:* Although green growth policies may be fairly extensive on paper, implementation remains an issue and in general is only at an early stage. All respondents identified insufficient institutional capacity as a key barrier to delivery. This is even more true at a subnational and sector level. Progress is often dependent on key senior individuals who often move on due to civil service staff rotation. Poor governance and corruption were also identified as issues.
- *Competition for scarce resources:* Several respondents suggested that the potential higher up-front costs of green growth policy create opportunity costs for resource-constrained economies. This is particularly true in terms of access to green technologies, an issue that has in turn become a policy focus for countries such as India within the international climate negotiations.
- *Weakness around evidence base:* Green growth remains poorly defined and understood among policy-makers and the research community. Some respondents indicated that the lack of evidence about the costs, benefits and potential trade-offs was preventing robust policy-making. There is only limited lifecycle cost analysis in budgeting and planning. Monitoring systems to assess the impact of policy are relatively weak. The interdisciplinary nature of green growth also creates challenges in the underlying research.
- *Challenging operating environments:* Some countries in the region have high levels of political instability, which create barriers for longer-term policy-making. Stakeholders in Afghanistan reported that there was little long-term strategic thinking about climate change or its impacts on sector planning, and that even donors were forced to balance green growth against more pressing development objectives.

Thanka et al (2013), in their study on institutional capacity for climate adaptation in India, report limited levels of knowledge and awareness among policy-makers on climate change, and more pressing priorities for poverty management and alleviation. This is ascribed partly to the uncertainty surrounding climate scenarios but also to the perception that climate adaptation is a donor-driven agenda and the lack of media interest in climate-related stories. Dubash (2012) explores the challenges of integrating domestic and international policy positions in India, noting the need to integrate climate policy into the complex governance apparatus of India's federal system.

3.6 The role of the private sector and CSOs

Programmes and policies on green growth cannot exist on their own. They need to be built and refined through continuous engagement with and participation on the part of stakeholders, including government at the central and decentralised levels, the private sector, members of civil society, and other non-governmental agencies (UNDP, 2012b). Engagement is considered important to ensure ownership and sustainability. It creates a supportive environment for green growth policies, and it ensures that incentives are developed in a way that encourages investment.

3.6.1 The private sector

Green growth policies cannot be implemented without strong engagement with the private sector – more than 80% of the investment required for mitigation and adaptation will need to be privately funded. In the meantime, governments need to do their part in creating a suitable investment

climate for businesses, promoting models for them to leverage funds and supporting public–private cooperation.[14]

Climate investments present the whole range of risk profiles and could therefore interest a variety of financial players, from investors with a low tolerance of risk, such as institutional investors like pension funds, to ones who are prepared to accept a high risk for higher expected gains, such as venture capitalists. Other players – particularly industrial groups and suppliers of technology or services relating to emissions reduction or climate change adaptation – may also be interested. Innovative partnership models for climate investment are still being developed. Country and market conditions influence the use of instruments. The preferred financial instruments vary: for poorer countries, public financing vehicles typically in the form of grants and subsidies are essential for triggering initial investments, while for emerging economies with more liquidity in capital markets financial mechanisms such as loan guarantees and other PPPs are needed.[15]

India: building skills for green growth

The Indian government is taking a thematic approach to the shortage of green economy skills. In some sectors, such as energy efficiency in buildings, agencies like the Indian Green Building Council and the Bureau of Energy Efficiency are conducting training programmes and a national certification examination for energy managers and energy auditors. The Ministry of Road and Surface Transport is organising skill development programmes for drivers and conductors of compressed natural gas (CNG) buses and attendants at CNG filling stations. Agricultural training institutes are providing training in plant protection, integrated pest management and locust control. Needs-based training programmes in new and emerging areas such as organic farming are organised by the Indian Council of Agricultural Research.

Source: Sanghi and Sharma, 2012, referenced in OECD 2013

In South Asia there is some progress in creating incentives for private sector involvement:

- In Afghanistan, the ANDS mentions the importance of creating investor-friendly regulatory frameworks for private sector operations in the development of natural resources and infrastructure.

- In Bangladesh, the sixth Five-Year Plan indicates that incentives, in the form of tax rebates and tax holidays, will be provided and that the incremental costs incurred will be met in various forms/sources. Also, Bangladesh has introduced a programme to provide loans at a 9% interest rate to green investors, which compares favourably to the average interest rate for other investors in the country of more than 13%. This programme is aimed mostly at renewable energy like solar panels, biogas and some other limited areas (Recent Reform Initiatives of Bangladesh Bank, 2012).

- In India, the NAPCC (2012) has a strong focus on private sector involvement through different missions on renewable energy through the promotion of PPPs, subsidies, reduced VAT on infrastructure and tax incentives for promotion of energy efficiency. The low carbon strategy for inclusive growth (2014) mentions energy pricing for renewable energy, tariff setting, and budgetary support.

- In Nepal, the draft District Forest Strategic Plan includes actions such as removal of tax and VAT for forest products from private forests, land tax waivers for the land used for private forests, and soft loans and tax waivers to promote local forest-based enterprises. The District

[14] See Green Growth Action Alliance (2013), among others.
[15] This is based on team analysis.

Climate and Energy Plan (2013) describes the subsidies provided for each renewable energy technology (i.e. biogas, solar and micro hydro).

- In Pakistan, the Draft NCCP (2012) promotes incentives for using an energy mix and switching to low carbon fossil fuels and other indigenous technology, in addition to incentives for green construction, and the NSDS (Draft, 2012) mentions tax breaks, subsidies, duty and fiscal relaxations that need to be approved through provincial sustainable development councils.

3.6.2 Civil society organisations

International best practice has shown that granting a voice to communities and civil society to participate in policy-making will alter the policy landscape in favour of the poor and marginalised and increase the state's responsiveness.[16] Correspondingly, accountability in terms of policy-making is an important tool to ensure that the voices and interests of communities – especially marginalised communities – are considered in the determination of policies. In India, for example, the NPCC (2012) contains a National Mission for Sustaining the Himalayan Ecosystem; thus, community-based management of the Himalayan ecosystems will be promoted with incentives to community organisations and *panchayats* for protection and enhancement of forested lands.

3.7 Alignment between green growth and traditional growth patterns

The emergence of green growth policies represents something of a departure from traditional development patterns across South Asia. From a policy formulation perspective, aspects of macroeconomic growth, environmental sustainability and social inclusion are for the first time being brought together into integrated development frameworks (i.e. sustainable development or growth strategies), and the co-benefits and trade-offs are being explicitly considered.

A key area of progress has been an increasing focus of policies on decarbonisation, and an understanding on the part of lead policy-makers of the need to accept higher costs for clean energy production (and associated increases in energy prices) in return for longer-term environmental benefits and avoided climate impacts, although the process of subsidy reform has been slow. There is also a stronger focus on environmental compliance around large-scale infrastructure and extractive industries than was previously the case. The potential for new markets and jobs in the manufacturing sector and the deployment of green technologies also represents a new area of policy focus, particularly in the hope of capturing higher value-added market segments. However, such policies also draw upon traditional concepts of self-sufficiency, as renewable energy is broadly drawn from indigenous resources, and helps to reduce the volatility associated with fossil fuel prices.

The green growth agenda is also well aligned with some existing approaches to poverty reduction and social inclusion. Resilient agriculture strategies are often grounded in community-based approaches, which encourage smallholder farming and labour-intensive approaches. Social safety nets can be aligned with resilient work programmes. The deployment of small-scale renewables aligns well with community-led SME development policy. Governments also continue to play a dominant role in green growth policy, with private sector-led approaches and incentive schemes less well developed than state programmes. Finally, although much has been done from a policy development perspective, questions remain about the commitment and capacity of governments to pursue green growth in a sustained manner, given the potential short-term trade-offs. The potential trade-offs are examined in more detail in the following section.

[16] See O'Neill (2007), among others.

4 Evidence of benefits, costs and trade-offs

This section explores the evidence base on the benefits and costs of green growth, and the potential for trade-offs between its components, i.e. macroeconomic growth, social inclusion, and environment and climate resilience. The section has a particular focus on South Asia and draws from the literature review, policy review and stakeholder interviews.

At a global level, the evidence base on the benefits, costs and trade-offs within the green growth concept is relatively well established.[17] In general, the literature seeks to demonstrate a positive narrative around the social, economic and environmental utility of the green growth concept.

Benefits of green growth

- Sustained natural assets on which to build growth and human wellbeing: to provide the inputs for marketable goods as well as the ecosystem services upon which quality of life depends.
- Reduced poverty, depending on the design of policies for green growth and complementary measures, which will affect how the benefits and costs of development are distributed.
- New economic growth opportunities and potentially new job opportunities, particularly through ecosystem service provision and technological innovation.
- Resilient infrastructure that does not lock countries into fossil-fuel based energy dependence and emission-intensive pathways.
- Reduced vulnerability to climate change and natural disasters.
- Greater access to clean water and sanitation services, diverse energy supplies and greater energy security, accompanied by lower pollution and GHG emissions.
- More secure livelihoods for those dependent on sustainable management of natural resources such as agricultural land and soil quality, fisheries and forests

The benefits, particularly those open to quantification, are well examined. For example, the benefits of low carbon development on GHG emission pathways can be easily modelled (IPCC, 2014). It is relatively straightforward to quantify the number of jobs associated with a renewable energy development, with Input/Output models providing a good starting point.[18]

For other components of green growth, however, the evidence base is more challenging. For example, it is more difficult to quantify the avoided damages associated with climate-resilient growth, but the narrative of benefits is clear, and some work has been done to assess these benefits within the regional and national economics of climate change studies (IPCC, 2014; World Bank, 2010).

OECD (2013) recognises the specific challenges associated with green growth in developing countries. These include the following:

[17] See IPCC (2014) and ADB (2013), among others.
[18] Although there is still not a clear definition of what ‘green jobs’ are.

- The large informal economy, which accounts for over two-thirds of the economy in South and South East Asia (Parlevliet et al., 2008). This complicates the implementation of the economic, fiscal and regulatory policy instruments needed for green growth.

- High levels of poverty and inequality, requiring targeted policies to avoid negative effects on the poorest. However, the capacities required for designing and financing such policies are limited.

- Weak capacity and resources for innovation and investment, both public and private. This limits developing countries' ability to seek out and exploit opportunities that emerge from a green growth agenda.

- An urgent need for rapid development, economic growth and welfare improvement. In lower-income countries, where natural assets are frequently abundant, the welfare returns from transitioning to green growth are not as evident as those from conventional economic development, particularly in the short term.

- Few mechanisms to ensure those who protect natural assets (such as forest land for carbon sequestration) receive large enough financial incentives to maintain them. Without strong incentives, the political viability of green growth will be weakened.

The potential trade-offs between green growth and other economic, social and environmental policy objectives are less well understood than the benefits, and are less frequently explored in the literature. Some studies do recognise the need to balance these trade-offs. For example, the OECD study recognises the need to accompany green growth reform with social welfare policy. Examples quoted include recycling revenues from fossil fuel subsidy reform to cheaper public transport or more affordable health care, and accompanying forest certification programmes with land tenure reforms and premiums for community-managed programmes. The limited discussion of trade-offs may be for a number of reasons:

1. They challenge the prevailing positive narrative of sustainable development;

2. They may be short term and transitional in nature; and

3. There may be greater methodological challenges in quantifying and valuing the social and ecological risks associated with green growth.

The overall evidence base for the effectiveness of green growth policy in South Asia is weak. Green growth is a relatively new concept in the region and it may be somewhat premature to undertake ex-post evaluation, particularly of the trade-offs between its constituent components. Some work has been done to analyse costs, benefits and policy options at a sectoral level (e.g. the Climate and Development Knowledge Network (CDKN) Nepal study estimates that the total annual costs of floods in Nepal is currently equivalent to 0.8% of national GDP, heavily impacting the hydroelectric and agricultural sectors (IDS-Nepal, PAC and GCAP (2014). However, global studies of green growth best practice (e.g. Global Green Growth Institute (GGGI), 2014) tend to cite few examples from the South Asia region. One exception to this rule is that Nepal is cited as an example of good public policy planning. The ADB Economics of Climate Change Study (forthcoming) may provide a more robust evidence base for policy-makers.

4.1 Macroeconomic aspects

The following sets out potential co-benefits and trade-offs between green growth and wider macroeconomic development, in terms of GDP growth, employment and competitiveness.

4.1.1 GDP growth

Co-benefits

Climate change and natural resource degradation are forecast to result in significant economic costs. The IPCC Fifth Assessment Report suggests that GDP growth will be 0.2 to 2.0% lower once global temperatures have risen by 2°C (IPCC, 2014).[19] The same report identifies flood damage, food and water shortages and heat-related mortality as key climate impacts (IPCC 2014). The findings of the ADB study on the economics of climate change in South Asia indicate that the total cost of climate change will increase over time and will be prohibitively high in the long term. The World Bank estimated that India is already incurring environmental damage costing around 6.5% of GDP annually (World Bank, 2013c). Without global deviation from a fossil fuel-intensive path, South Asia could lose on average an equivalent of 1.8% of its annual GDP by 2050, which will increase progressively to 8.8% by 2100. Bangladesh, India and Nepal are likely to face 2.0%, 1.4% and 2.2% losses of annual GDP by 2050 under a BAU scenario. At a regional level, this could be reduced if pledges made under the Copenhagen–Cancun agreements were implemented, to 1.3% by 2050 and 2.5% by 2010 (ADB, 2014b). Bangladesh and Nepal will be most affected as a percentage of GDP (ADB, 2013).

Identifying the GDP benefits of green growth in Bangladesh: Building a policy response

A recent ADB study undertook an assessment of the likely economic impacts of climate change on different sectors of the Bangladesh economy. The economic costs of climate change would be about 9% of GDP by 2100 under a BAU scenario and about 2% were the pledges set out under the Copenhagen–Cancun agreements to be implemented. To offset these impacts, investment–GDP ratios would have to be increased year on year to meet growth targets. A key impact would be the reduction in paddy rice production, which would fall by 1.60% by 2050 and 5.05% by 2100 under BAU scenarios. This would have significant impacts on food security, as prices and imports rose. Inundation of land would generate GDP losses of 0.9% by 2100, with impacts across the economy. There would be impacts on labour productivity, land availability, water quantity, electricity supply and infrastructure quality. The overall impacts would fall primarily on poorer segments of the population, and would hit export growth.

The study recommends that the Government of Bangladesh enhance the productivity of its export-oriented sectors, by improving competitiveness and reducing the costs of doing business. In order to mitigate these negative impacts on the poor, government should adopt policies and programmes to avoid poverty traps through growth, employment and poverty reduction strategies (e.g. safety net programmes), particularly for the urban poor. Further investments in agri-food research, productivity improvement and capital investment are recommended.

Source: ADB, 2014a

The Economic Impact Assessment of Climate Change in Key Sectors in Nepal estimated that the direct economic costs from climate change on agriculture, hydro-electricity and water-induced disasters could be equivalent to 2% to 3% of current GDP by mid-century (current prices, with static assumptions), although more modest or more extreme outcomes are also possible (IDS-

[19] However, these estimates must be treated with particular caution, as they only involve a partial coverage of impacts, there are very large uncertainties involved, and they are dependent on assumptions about discount rates and equity.

Nepal et al., 2014). Natural resource degradation may also have a significant impact on future growth. For example, the World Bank has estimated that the damage is 1.8% of GDP for farmland, 0.8% for water quality and 3% of GDP for pollution (World Bank, 2013b).

From a resilience and natural resource conservation perspective, there is evidence that green growth investment will reduce the above GDP impacts. The ADB study suggests that investment in adaptation will need to be 0.46% of GDP (US$ 40 billion) by 2050 and 0.86% (US$ 73 billion) by 2100 to offset the GDP impacts of climate change (assuming no mitigation) (ADB 2014b). This would be reduced under a mitigation scenario as the costs of adaptation would reduce (to 0.36% and 0.48% respectively). India already claims to spend 2.6% of GDP on adaptation to climate variability, with agriculture, water resources, health and sanitation, forests, coastal zone infrastructure and extreme events being specific areas of concern.[20] Under a mitigation scenario, the costs reduce broadly in line with the reduction in impacts, although some regional variations exist (ADB, 2013). The MOSTE Nepal report suggests that adaptation spending would need to be about 0.5% of GDP (or US$ 2.4 billion in total to 2030) to provide climate proofing in the three risk areas of hydropower, agriculture and water-based disasters. Natural resource conservation (i.e. investments in soil conservation, watershed protection and pollution control) are also likely to have positive GDP effects.

From a mitigation perspective, the broader literature on the economics of mitigation suggests that reducing GHG emissions to acceptable levels can be achieved while not significantly undermining growth. For stabilisation levels of global warming to 2°C, modelling suggest impacts of 2% to 6% of global consumption by 2050 and 3% to 11% by 2100, equivalent to annualised reduction of consumption growth by 0.04 to 0.14 percentage points over the century (IPCC, 2014). Costs depend on the mitigation options available and chosen by each country. IPCC Shared Socioeconomic Pathways analysis indicates that green growth policies will deliver positive benefits compared to the costs and lead to higher GDP than conventional growth pathways in the long run, but this analysis does not consider the temporal and social distribution of costs. Most MAC curves suggest that about one-third of energy policies are financially profitable (due to lower bills and improved efficiency). For most large developing countries, including India, low-cost measures (defined as less than US$25/tCO2e) account for over 60% of total mitigation potential (VV.AA, 2010). In India, where at least four MAC curves have been developed, cost-effective abatement potential (with a MAC of less than zero) is estimated at between 12% and 40% (SEI, 2010). These measures are primarily related to energy efficiency improvements, notably in the building and industrial sectors (where there are cost savings associated with reduced fuel use). However, significant capital is required up front to achieve longer-term benefits, and availability of funds may be a concern.

The recent report on Low Carbon Strategies for Inclusive Growth prepared by the Indian Planning Commission (Government of India, 2014), commonly known as the Kirit Parikh Report, states that a low carbon development scenario can deliver annual growth of 6.9%, which is only marginally lower than the baseline inclusive growth scenario (7%). However, the low carbon growth scenario would require additional investment of 1.5% of GDP, to be met either from additional domestic or international resources. If this investment were to be met entirely from domestic resources, then the cumulative loss of economic output would be US$ 1.34 trillion over the period 2011–2030.

The increased energy security and reduced impacts of fossil fuel price volatility associated with renewable energy may also result in GDP benefits. The South Asian economies are net importers

[20] This is found in the Indian Ministry of Finance Briefing Paper (2012). The estimate is based on current spend on climate-sensitive sectors. The global estimates relate to the incremental impacts of climate change over time above the current baseline. See http://finmin.nic.in/the_ministry/dept_eco_affairs/economic_div/India_Climate_Change_Finance.pdf

of energy.[21] India is the most vulnerable in this regard, with net import dependency of over 25% in 2010. The Environmental Impact Assessment (EIA) reports that net import dependency for coal reached 23% by 2012.[22] Renewable energies can play a significant role in hedging against oil price volatility as they promote indigenous production. Lowering the fossil share in the energy mix will in principle increase the resilience of an economy to oil price volatility (i.e. reduce its exposure and vulnerability). Moreover, the avoided GDP losses resulting from the reduction in energy price volatility associated with renewable energy could considerably offset the installation costs of new renewable energy capacities (World Bank, 2013).

Trade-offs

While the IPCC Shared Socioeconomic Scenarios suggest that overall long-term macroeconomic growth is likely to be higher under green growth policies, there is the potential that short-term financial costs will be imposed on strategically important sectors. Green growth policies may be inconsistent with economic advantages and the historic infrastructure investments of countries adopting them, and be economically costly and face popular resistance (Resnick et al., 2012). Green growth therefore requires other short-term policy adjustment costs and may meet resistance, particularly from the poor.

Many mitigation measures are negative or low cost and will have only a limited impact upon GDP growth. However, other abatement measures have high up-front capital costs, and a significant proportion have high overall MACs (McKinsey & Company, 2009). This is particularly challenging in a country like India where capital- (and emission-) intensive industries (e.g. extractives, the power sector, transport, metals, etc.) represent a key sector for development.

In the same way, while there are many low-cost, 'no regret' adaptation measures (i.e. measures that make economic sense even under a 'no climate change' scenario), others carry significant additional costs. For example, the costs of mainstreaming resilience into large infrastructure development through more robust design standards may result in higher costs.

These additional costs divert investment from other potentially productive uses, and must be met either by public or by private investment. Even though economic growth is projected to be higher under a green growth scenario, up-front costs can have an impact on the timing of these economic returns. Green growth policy therefore needs to be subject to rigorous appraisal to avoid the potential for unintended consequences at a sectoral level and to allow for transition policies where appropriate, so as to minimise costs to the most vulnerable groups.

[21] See www.sari-energy.org/PageFiles/What_We_Do/activities/Advancement_of_Transmission_Systems_Interconnection_April2014/Presentations/Features_Indian_Electricity_Grid_Code_IRADe.pdf
[22] See www.eia.gov/todayinenergy/detail.cfm?id=17551

Understanding the opportunities and constraints of low carbon development in India

A McKinsey study estimates that GHG emissions will grow in India to between 5.0 and 6.5 billion tonnes per annum by 2030 under BAU. An abatement case would see this reduced to between 2.8 and 3.6 billion tonnes per annum. A number of economic and energy security benefits are identified, including the reduction of 100 million tonnes of coal imports, 60 million tonnes of oil imports, a 20% reduction in power capacity requirements and a 45% reduction in coal use.

The report identifies a number of trade-offs associated with capturing this opportunity. These include the high level of capital investment required (between Euro 600 and 750 billion) over the period to 2030, and the opportunity cost of funds that might be directed to meet India's high growth ambitions and social inclusion aspirations. Furthermore, the report identifies that more than 60% of GHG abatement opportunities (particularly in sectors such as renewable energy and forestry) carry a net economic cost, equivalent to Euro 18 billion per annum over the period to 2030. This presents a funding challenge in itself. There are also concerns about market failures, the pace of policy implementation, technology uncertainty and skill shortages. As a result, the report concludes that only 10% of the technological potential is readily achievable.

Source: McKinsey 2009

4.1.2 Employment

The evidence base suggests support both for and against the proposition that green growth can result in a net increase in employment and wages (Schmalensee, 2012). The majority of the literature refers to the positive impacts of job creation in green industries (e.g. renewable energy). There are few examinations of the indirect (supply chain) or induced (wealth impact) effects (Bowen, 2012). There is some discussion that the green growth sectors are likely to have higher levels of labour intensity than their non-green counterparts (Strietska-Ilina et al., 2011; Bowen, 2012; Cai, 2012). The issue of skills development is seen as central to supporting job creation opportunities in green sectors, but there is some concern that there is a disconnect between employment and green growth policy formulation that prevents these opportunities being explored (Strietska-Ilina et al., 2011).

Are green sectors more labour intensive? Perspectives from the OECD

The International Energy Agency (IEA) has studied the impact of a transition to low carbon development and the impact of employment in the environmental goods and services sector. They concluded that the environmental industries were in general more labour intensive than traditional industries, particularly the renewable energy sector. This was partly explained by the fact that renewables were not yet cost-effective, requiring higher inputs for a given amount of output. As a result, the IEA estimates that for every billion dollars invested in clean energy technology, 30,000 new jobs will be created. Additional studies have shown that the renewable energy sector generates more jobs than the fossil fuel-based energy sector per unit of energy delivered (Kammen et al., 2004). While labour intensity is higher for the majority of renewable energy activities such as energy efficiency, smart metering and renewable energy production, other activities such as carbon capture and storage are much less so due to their capital intensity (IEA, 2009). However, the needs in terms of R&D of carbon capture and storage technologies mean research jobs might increase considerably in this sector to meet the needs of pilot projects.

Source: OECD 2010

Co-benefits

Green growth has the potential to increase employment in different sectors, including in renewable energy, transport, waste, natural resource management and adaptation-related industries (insurance, resource-efficient technologies, resilient housing, etc.) (Jarvis et al., 2011). Wenija et al. (2011) analyse the direct and indirect employment impacts of two main mitigation policies in the

power generation sector, noting that mitigation policies in China caused 44,000 net job losses, offset by 472,000 net job gains, and suggest that, for every 1% increase in solar generation, there would be a 0.68% increase in total employment in China. Given the regional focus on employment and socially inclusive labour policy, there may be a number of benefits to employment from pursuing a green growth strategy. Some net additional jobs may be created, while others may be transformed and redefined (UNEP, 2012). A key element is the distribution of benefits, as employment income may be more equitably distributed than profits or rents arising from green investments. There is also some evidence that some green sectors may be more labour intensive that those sectors that they replace, although this may be balanced against higher wage costs and lower levels of overall economic efficiency. The evidence base for the South Asia region is currently weak.

Trade-offs

Policies that support low carbon growth may seek to improve the efficiency of production (e.g. the move towards larger commercial farms in the agriculture sector), resulting in a reduction in labour intensity and a more challenging employment environment for those businesses that cannot afford price competition (Urban and Nordensvard, 2013). While this may be rational from an economic perspective, it may in the short run create challenges for livelihoods among certain groups. Mechanised, high-input, specialised monoculture commodity farming employs far fewer people in food production, even as farm outputs dramatically increase. These improvements in farm labour productivity have substantially depended on the substitution of capital equipment (i.e. farm mechanisation) and agrochemical inputs for labour inputs. While there are significant benefits to applying advanced mechanisation of farm work in terms of much higher output per worker, there have also been costs in terms of reduced rural farm jobs that have not been balanced by a commensurate increase in non-farm jobs (ILO, 2012).

The question of whether the transformation process will result in a net gain in employment is therefore difficult for the following reasons:

- First, some employment will be substituted (such as in shifting from fossil fuels to renewables, or from truck manufacturing to rail car manufacturing, or from landfilling and waste incineration to recycling);
- Second, certain jobs may be eliminated without direct replacement (such as when certain packaging materials are discouraged); and
- Third, economic theory suggests that, over time, employment levels will tend toward the mean based on prevailing macroeconomic conditions and policies, despite short-term gains or losses in a given sector.

The evidence base for the South Asia region is currently weak also on trade-offs.

4.1.3 Competitiveness and trade

Co-benefits

The Green Growth in Practice Review (GGGI, 2014) states that ‘Green growth can enhance efficiency and productivity’ and ‘underpin industrial policy and macroeconomic goals’. The report argues that resource-efficient technologies and practices can increase competitiveness in comparison to conventional practices by reducing input costs and reducing the costs of production. The report also explores the growing demand for green technologies, products and services, with the potential to open new export markets and deliver long-term growth benefits.

Improving the competitiveness of energy-intensive sectors: India's PAT scheme

In India, addressing emissions from energy-intensive sectors is central to supporting low carbon transformation across the broader economy. These core industries include iron and steel, aluminium, ceramics, cement, lime and plaster, glass, pulp and paper, nitrogen fertilisers and basic inorganic chemicals. The adoption of ambitious GHG mitigation targets, and the early use of a carbon price on coal, has led to concerns about the competitiveness of this sector. The response of the government has been to set up an energy-efficiency trading programme for major Indian industries – the Perform, Achieve, and Trade (PAT) scheme. It covers the industrial sectors responsible for more than 60% of India's energy consumption.

The target for the PAT scheme will be stated in the form of the percentage reduction of Specific Energy Consumption from the value in the base year to that in the target year. Savings for the first commitment period of three years (2011–2014) are targeted at 10 million metric tons of oil equivalent (m MTOE). This corresponds to a 4.3% reduction in energy consumption per sector, with savings targets of 6.9 m MTOE in power sector and 3.1 m MTOE in the industrial sector. This will allow these sectors to remain competitive, even if India decides to expand its use of carbon pricing in the future.

Source: ICF 2012

Green growth policies can create new economic opportunities, in particular by leveraging public and private sector participation in R&D and by scaling up selected industries to support export and revenue generation (as with non-green growth industries). For example, the early development of solar photovoltaic technologies has enabled China to become a market leader (Ellis et al., 2013). By promoting the more efficient use of energy and resources, green growth development processes can also help to enhance the long-term competitiveness of a country's products in world markets through a number of competitive advantages, including: improved production efficiency; improved management of natural capital; signalling of sustainability practices to the global market; and improved prices. By capitalising on opportunities, countries can also take advantage of new sources of investment and climate finance that may become available in the future. For example, India is a front-runner in taking advantage of investment opportunities (especially in clean energy production) and climate finance (it is one of the major beneficiaries of fast-start finance).

Trade-offs

There are a number of potential issues related to competitiveness (Ellis et al., 2013):

- The potential for additional costs associated with green growth policies (adopting a carbon price, increased regulation, etc.) can have an impact on trade and competitiveness, particularly where competitor economies adopt lower environmental standards and benefit from a failure to price environmental externalities into the costs of production.

- The unilateral adoption of increased environmental levies can create pressures to implement restrictive trade practices towards those markets that do not adopt similar standards, such as border tax adjustments. Green levies can input into wider trade disputes and negotiations, particularly around carbon-intensive industries exposed to international trade and price competition (such as iron and steel, chemicals , pulp and paper, cement and aluminium). Carbon leakage (the transfer of industries and jobs to regimes with less robust carbon pricing regimes) is a concern for developed countries (Burniaux et al., 2010). India, along with other developing countries, has consistently taken the position that developed countries should avoid imposing countervailing border measures in the absence of binding mitigation targets.

4.2 Social and poverty aspects

Co-benefits

Green growth policy may be considered an opportunity to reduce poverty through the sustainable use of natural resources, preserving the environment, fostering sustainable agriculture, reducing GHG emissions and adapting to climate change. The Green Growth in Practice report states that, by 'reducing environmental degradation and conserving vital natural resources, governments can enhance the quality of life for citizens, especially the poor who are particularly vulnerable to natural resource limits and environmental damage' (GGGI, 2014).

There are many fundamental synergies between the long-term objectives of green growth and poverty reduction. The poor tend to be disproportionally more affected by climate change, in particular by climatic disasters, loss of biodiversity, and depletion of natural resources. The poor often depend on natural resources for their livelihoods. There is also a specific gender element whereby women are often the primary users of natural resources, for example collecting fuel wood for cooking, which is widespread in South Asia. The recent ADB study noted that the distribution of the impacts of climate change fall disproportionately on lower income countries and populations, particularly those affected by agri-food related constraints (ADB, 2014b).

Internalising environmental costs is predicted to have a positive impact on sustaining this source of capital and the livelihoods of the poor (Dercon, 2012). The World Bank estimates that 68% of the population across South Asia are dependent on the rural economy (World Development Indicators 2013), and that there will still be a majority of the population working in the agricultural economy by 2030 (Lal et al., 2011).

Direct co-benefits from interventions that are likely to be pro-poor can be derived from:

- Investment strategies resulting in better use of environmental resources for agriculture (land, water, etc.);

- Access to new technologies that are not only environment friendly but also cost-efficient and implementable by the poor (solar energy, efficient stoves, biogas cookers, etc.), sometimes with the support of subsidies; and

- Employment opportunities for non-specialised work (building local infrastructure, such as irrigation canals and conservation interventions, sustainable agriculture, etc.).

Indirect co-benefits come from tackling climate change and thus reducing environmental shocks and natural disasters.

Social safety nets and work programmes offer the potential for mainstreaming green growth activities (e.g. irrigation schemes, sustainable agriculture programmes, etc.). However, social safety nets are not being explicitly designed to adjust to green growth policy at present. Public work programmes (such as the Mahatma Gandhi National Rural Employment Guarantee Act in India or the Karnali Employment Programme in Nepal) have the potential to contribute to employment and at the same time invest in key agricultural investment for soil conservation and water management. For large-scale climate and environmental risks, safety nets may remain necessary despite resilience efforts adopted by government.

Orienting social policy towards resilience and environmental protection: MNREGA in India

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 the purchasing power of poor households in rural areas (particularly of women and minorities) and to contribute to environmental protection at the same time. Social and environmental policies are well integrated. Permissible activities focus on environmental preservation, predominantly water and soil conservation, afforestation and land development works.

MNREGA is regarded as a best practice example of 'Green Economic Policies' by UNEP (Sukhdevet al., 2010). There have been positive assessments setting out the 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 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 programmes. In particular, 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.

Source: ODI 2013

Co-benefits are more likely to be found between green growth and social inclusion where growth policies are oriented towards community development. Stakeholders in Nepal and Bangladesh (which promote community-based agriculture and participatory forestry models) saw a significant level of alignment with green growth in terms of supporting livelihoods, promoting ecosystem services and enabling job creation for the poor. A similar argument can be made for participatory forestry in India.

Trade-offs

Green growth is not inherently inclusive and does not necessarily lead to social benefits. On the contrary, the pathways to green growth may challenge the traditional programmatic approaches to poverty reduction (labour intensive, low skilled work programmes). Dercon (2012) argues that social trade-offs will inevitably exist. Green growth has the potential to work against traditional concepts of poverty-reducing growth through declining shares of agriculture in GDP, migration and urbanisation.

Green growth policies must be carefully designed to maximise benefits (and minimise costs) for the poor and most vulnerable by ensuring transition costs are minimised for the most vulnerable, either through subsidies or skills development.

The benefits of green growth in terms of poverty reduction are not usually measured. A further focus is required on assessing and monetising where possible the health and welfare benefits of green growth policies, particularly for vulnerable populations. When undertaking policy appraisal, the following should be considered (Dercon, 2012; DCED, 2012; team analysis):

1. The distributional effects of policy, factoring in distributional analysis or even equity weights into appraisal;

2. The dynamics of change, how the poor are affected and are able to respond (for example, analysing the impact on the poor of removal of fossil fuel subsidies);

3. The adequacy of the social protection system; and

4. The ability to monitor progress against more complex indicators that include poverty aspects and the distribution of costs and benefits between different socioeconomic groups over time.

Social impacts of hydropower development in North Eastern India

A United Nations Research Institute for Social Development (UNRISD) paper examines the potential social impacts of hydroelectric power dams on the river Teesta in India's north-eastern Himalayan region, supported as part of the Green Mission. The review of the policy agenda for water, land, forests and river dams suggests that current approaches toward growth have largely supported a mainstream development perspective, and often aggravated existing social inequalities in the process.

The paper finds that the effectiveness of 'green' or sustainable development approaches has largely been compromised due to their mainstream orientation. The data presented reveal that communities living within or adjacent to the sites of hydroelectric power projects have experienced displacement, loss of livelihood, social conflict and rapidly depleting natural resources. It also finds that socioeconomic and environmental problems have continued to replicate themselves in different parts of India despite a notable presence of the rhetoric of sustainability in policy documents on energy and responsible resource management at the national level.

Source: UNRISD 2012b

In particular, social safeguards should be considered as part of any transition process. Green growth policies also have the potential to cannibalise development finance in other areas that traditionally benefitted the poor. High levels of investment in low carbon development could, for

example, reduce the budgets available to the education or health sectors (Urban and Nordensvard, 2013).

Removing fossil fuel subsidies in India: The Kirit Parikh report

In late 2013, a government-appointed expert group – the Kirit Parikh panel – recommended to immediately hike prices of diesel by INR 5 a litre, kerosene by INR 4 per litre and cooking gas by INR 250 per cylinder, reduce the annual entitlement of subsidised cooking gas cylinders to six from nine, and phase out the diesel subsidy in one year.

Fearing the impacts of the removal of subsidies on the poor (particularly in urban areas), and aware of the potential impact upon state and general elections, the recommendations were not immediately implemented by the federal government. Rather, reform has continued incrementally, with a rise in diesel prices by 50 paise every month. A sharp diesel price hike could also cascade on to overall inflation, which is already high.

Despite incremental increases, the cost of fossil fuel subsidies remains large. In 2014, the new government is expected to pay US$ 10.6 billion, under the previous administration's final budget, to compensate sellers of diesel, kerosene and propane cooking gas for selling at a loss.

Source: Economic Times of India/Wall Street Journal

Even where benefits are clear, they may take time to realise, and social protection systems may be required in the interim to protect the vulnerable. For example, while sustainable agriculture is often considered a core green growth measure, the economic benefits may only be captured by farmers after a number of years (depending on the time required for land conversion and the growing cycle). During this time, poor farmers might be deprived of an income stream and require compensation or livelihoods support. Likewise, the removal of fossil fuel subsidies may create significant additional costs in the short term that need to be offset. Indonesia provides a good example of how the transition can be managed (IISD, 2010).

Trade-offs between green growth and social policy: Biofuel production in India

India's fuel-ethanol programme helps deliver a 5% blending mandate to reduce the emissions from fossil fuel transport systems and is supported by a number of tax incentives to sugarcane mills. The industry argues that the benefits are transferred to more than 5 million sugarcane growers in India, mostly smallholders in the states of Uttar Pradesh, Maharashtra and Orissa. However, it is not clear to what extent upstream growers have benefited or whether the value added is captured by the industry.

At the same time, India launched an ambitious National Biodiesel Mission in 2003 aiming at replacing 20% of the country's total diesel consumption by 2012. This attempted to build a new value chain based on non-food crops on marginal lands. There is a package of economic and regulatory incentives (for example, tax credits, concessional finance and access to land) for companies agreeing to set up industrial plantations or to engage in smallholder contract schemes. The government has also made such feedstock cultivation eligible for its NREGA, which provides up to 100 government-paid days of manual rural labour per year. The main crop of choice has been jatropha. However, yields have been lower than expected, the policy has resulted in unwelcome monocultures, and land has in some cases been appropriated. Food production may have also suffered as a result. As a consequence, the government put back the biodiesel target to 2017.

Source: UNRISD 2012

Care should also be taken to assess unintended consequences, such as the impacts of biofuels on food prices or renewable energy development on consumer energy prices. In fact, policies may result in a chain of effects that impact negatively on commodity prices and employment levels. For

example, in terms of biofuels, the problem can be compounded by the overlap in the use of some crops for both purposes. There is some evidence that large biofuel plantations have negatively affected the land rights of the poor (Neville and Dauvergne, 2012). Bastos Lima (2012) provides a case study for India, which sets out the trade-offs with smallholder biodiversity, livelihoods and food security.

4.3 Resilience and environmental aspects

4.3.1 Climate adaptation and resilience

Co-benefits

There are potentially strong synergies between green growth and climate adaptation and resilience. South Asia already experiences high impacts and economic costs from current climate variability (including from natural hazards such as cyclones, droughts and floods – see section 4.1.1). Future climate change will increase many of these impacts and add new risks; indeed, South Asia was highlighted as a major vulnerable region in the recent IPCC Working Group II Summary (IPCC, 2014).

At the global level, there are obvious synergies between green growth and resilience, as green growth reduces GHG emissions, which reduces the risks of future climate change (thus reducing future losses). At the national macro-level, green growth can reduce the current economic costs of climate variability, leading to immediate economic benefits as well as reducing the future losses from climate change. This may be through changes to the structural composition of the economy, for example away from sectors that have high climate sensitivity (e.g. agriculture) or through specific resilience and adaptation actions that reduce the potential for current and future economic costs of climate impacts.

At the national–micro level there are a number of potential synergies. Most of these focus on sector mitigation–adaptation linkages, for example:

- There are potential synergies between avoiding deforestation (or forest conservation and afforestation) and resilience, because of the reduction in GHG emissions and the role of forests in watershed management (Ravindranath, 2007).

- There are clear green growth–climate resilience synergies in agriculture through the greater uptake of climate-smart agriculture (e.g. conservation agriculture (minimal soil disturbance, permanent soil cover and crop rotations), soil and water conservation, and sustainable agroforestry). These options increase yields (relative to rain-fed agriculture), reduce GHG emissions, increase climate resilience, and have broader environmental benefits (McCarthy et al., 2011).

Trade-offs

Trade-offs identified include the following:

- For energy demand, there are high potential feedback loops between warmer temperatures from climate change and the increased demand for cooling – leading in turn to higher electricity demand and increased GHG emissions (unless generation is decarbonised or passive cooling is adopted). These issues are already a particular concern for India, due to the high cooling needs and rising per capita incomes, and will likely become more acute over time (Akpinar-Ferrand Ezgi and Singh Ashbindu, 2010).

- There are also potential conflicts for green urbanisation, with a potential conflict between actions that seek to reduce GHG emissions (through high density cities) versus options that can increase urban heat island effects (low density cities and urban green space).

- In the energy generation supply sector, there are some potential conflicts between green growth (renewables) and resilience. These include the vulnerability of hydropower to future rainfall and variability trends, which is important given that hydro-development is a source of major export growth for some countries (e.g. Nepal). It also applies to the potential vulnerability of biomass/bioenergy to shifting climates and the linkages to water demand, with potential social impacts another factor to take into account.

- There are similar mitigation–adaptation linkages emerging for the water sector. Although water demand is primarily sensitive to population growth and urbanisation, it is also likely to increase with rising temperatures and this in turn may increase the energy demand (and GHG emissions) associated with water abstraction and transport. These effects may be exacerbated by climate change reducing precipitation in some countries, notably mid-latitude and subtropical dry regions. This suggests a conflict between competing demand and supply (although there is also the potential for synergy from resource use efficiency).

Trade-offs between climate resilience and clean power generation: Hydro-electricity in Nepal

A recent study on the economics of climate change in Nepal analysed the potential trade-offs between pursuing clean energy development based on Nepal's significant hydropower resources and potential climate change impacts. The analysis of the future impacts linked a hydrological model to a power plant and energy system model in order to understand how climate change affects dry season flows and reservoir storage recharge, and thus future electricity generation and plant investment profiles. The analysis found that the future effects of climate change on the hydroelectricity sector are potentially large but uncertain, varying by climate projection, river catchment and over time. To take this uncertainty into account, two alternative climate models were used.

The main additional risks related to the climate change-induced reduction in river flow during drier periods for run-of-river plants (and associated reduction in output) and the increase in high flows (which will mean facilities need to be planned with greater capacity). Based on discussions and the analysis of the climate and hydrological modelling results, the total additional adaptation costs to build resilience into the planned future sector development is approximately US$ 500 million (present value), above the baseline for the period, of which US$ 200 million falls on the public budget.

Source: IDS-Nepal, PAC and GCAP (2014)

4.3.2 Environmental sustainability and biodiversity

Co-benefits

Many of the impacts of development upon the environment can be reflected in economic accounts (e.g. the productivity of labour affected by environmental health problems and reduced productivity of agro-ecosystems), but some do not enter the accounts at all. While the theoretical structure for expanding the accounts has been laid out in various reviews, the empirical challenge of doing so is substantial (Reilly, 2012). Green growth also has high potential synergies with environmental sustainability, particularly through resource efficiency, cleaner fuels, and end-use efficiency. These reduce natural resource use and pressure, the degradation and loss of natural and semi-natural habitats, and therefore the impact on biodiversity. In turn, this can enhance the ecosystem services these natural habitats provide (i.e. the economic benefits from provisioning, supporting, regulating and cultural services). It also maintains and enhances natural capital, which is a key component of (sustainable) macroeconomic growth, even if this is not explicitly captured in formal economic

accounts or GDP. Greener growth also reduces environmental pollution, including air, water and waste pollution. By reducing these external costs, it has positive economic effects. In the South Asian context, this is particularly important due to the high external costs of air pollution, which leads to higher resource costs from medical treatment costs, lost productivity, and high dis-utility. These benefits could be very large, with one study suggesting that low carbon pathways (to 2050) potentially increase average life expectancy in India by 2.5 years (Holland et al., 2011).

Trade-offs

While the synergies between green growth and environmental sustainability are large, there are some potential conflicts. For example, the move towards greater GHG efficiency in agricultural economies may result in larger-scale farms that have negative impacts on biodiversity and promote monocultures (Urban and Nordensvard, 2013), although such trends are currently more developed in South East Asia than in South Asia. While the internalisation of environmental externalities is preferable from the perspective of social welfare, it may have impacts on the private sector because it will increase input and production costs, which can have an impact on growth, investment and competitiveness in the short run.

Analytical work is ongoing in the region to provide more robust valuation of ecosystems services and benefits to avoid the redirection of land to other productive uses on the basis that their current use is not properly understood or monetised. Examples include Verma et al. (2013), Kumar (2012) and Chopra et al. (2009).

5 Lessons from other countries

While the evidence base for the effectiveness of green growth continues to emerge in South Asia, in other regions there is a more developed policy base. The Green Growth in Practice report highlights a number of examples where policies and programmes have driven private sector investment and changed consumer behaviour. Best practice country examples include Chile, China, Germany, Korea, Mozambique and Rwanda (GGGI, 2014).

A number of key factors are recognised in terms of successful design and implementation of green growth policy:

1. Employ well designed planning and coordination processes;
2. Establish clear visions, targets, and baselines;
3. Undertake robust analysis and balanced communication of the benefits of green growth;
4. Prioritise measures and technologies and construct credible pathways toward targets;
5. Design portfolios of policies to address near-term development and longer-term green growth transformation goals and respond to specific market failures and political economy challenges;
6. Design public finance instruments to overcome the barriers to mobilising private investment into green growth sectors;
7. Tap the power of public–private collaboration;
8. Pursue mutually reinforcing action across subnational and national levels of government; and
9. Build and maintain robust green growth monitoring and evaluation systems.

A key lesson is that the most successful programmes are those that respond to the trade-offs associated with green growth, particularly those encountered during transition. The report also recognises that further work is required to be able to evaluate the long-term success of such programmes.

In the developing country context, and especially for LDCs, the main focus of green growth policy has tended to be on resilience (adaptation), as advanced through the NAPA process and now the national adaptation plans, reflecting the low levels of current emissions in most of these countries. However, there are a number of countries that are advancing synergistic low carbon, climate-resilient strategies, with specific green growth policies.

The IPCC 5th Assessment Report[23] concluded that the most advanced of the LDC examples were in Ethiopia[24] and Rwanda.[25] Given the importance of climate change in these highly vulnerable countries, they are looking to build climate resilience but also recognise the benefits in advancing low carbon development. The linkages between emission reductions and adaptation in these studies are still at an early stage and most of the synergies between adaptation and mitigation are centred on the agricultural and forestry sectors, rather than macroeconomic policy. Nonetheless, these provide some useful lessons for South Asia:

[23] Chapter 15 of Working Group III, 2014
[24] Ethiopia's Climate Resilient Green Economy Vision, 2011 and the Green Economy and Climate Resilience Strategy, 2011.
[25] Rwanda's Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development, 2011.

- The formulation of a specific green growth policy (low carbon and climate resilience) is key for advancing synergistic policy, as it moves beyond the typical silos of mitigation and adaptation.
- The design of institutions affects the choice and feasibility of policy options as well as the sustainable financing of measures.[26]
- Strong leadership is essential: both Ethiopia and Rwanda have high-level political champions (i.e. the president or prime minister). This drives the policy through national development, budget lines and down into sectors, which in turn need to report on progress back up the chain. This contrasts with green growth policies that originate in the Ministry of Environment, which have little traction due to the low accountability of other sectors and the lack of budgetary incentives.
- Flowing from this, there is a need to incorporate green growth in the national vision (i.e. the 2030 aspirational vision) as well in medium-term development plans (e.g. five-year plans) and sectoral plans (e.g. sector master plans), rather than as a standalone policy. These should ideally be linked to budget allocations – for example, Rwanda has included a set of climate mainstreaming indicators for every ministry, which are included in the budget circular.
- Both countries are using emerging climate funds and mechanisms to help incentivise action in line ministries through finance opportunities.

One notable driver for these strategies (in both Ethiopia and Rwanda) was the lack of indigenous fossil fuel reserves. The low carbon aspect of green growth therefore provides strong growth incentives through reduced oil imports (improving balance of trade, reducing price volatility, etc.) and, in the case of Ethiopia, it provides an opportunity for export growth through major hydro-development. This has direct relevance for South Asia, especially for Nepal, which also has low fossil resources and high potential for hydro-electricity exports.

The fossil reserves in other countries may, however, be less conducive for green growth. It is notable that, in other countries that have large fossil reserves or have recently found large exploitable reserves (e.g. gas in Tanzania), the incentives for low carbon growth are significantly diminished, and medium-term development planning is moving back towards fossil exploitation and a classic industrialisation model. The reserves of coal in India, and gas in Bangladesh, Afghanistan and Pakistan, will strongly influence the green growth potential: once large reserves are found that are potentially exploitable, it is almost impossible to avoid a resources push, and this tends to spill over into other sectors. It is also noted that, for Bangladesh, the primary focus will be resilience, given that the country is among the most vulnerable countries in the world to climate change. While India has more poor and vulnerable people to climate change than any of the other countries, it also has strong response and capacity mechanisms (OECD, 2013).

Finally, there is likely to be an important environmental driver for India, related to the use of coal and the resulting air pollution and health concerns (externalities). The extremely high levels of coal related pollution in China are already influencing policy, with more of a move toward energy efficiency and renewables (which may be due to the high marginal costs of cleaner coal production). The potential for green growth built around lower air pollution (with reduced GHG emissions as a co-benefit) may therefore offer high potential for India.

[26] See also IPCC (2014).

6 Recommendations for further research and capacity

6.1 Research topics

The report has reviewed the evidence base for green growth in the South Asia region. It has found that there is a significant volume of policy and programme activity in relation to the sub-components of green growth (i.e. low carbon development, climate resilience and social equity), but that the evidence base on the relationship between these three topics is relatively weak and underexplored. On this basis, we have identified the following research topics that might act as a guide for further research:

6.1.1 Macroeconomic growth

- From a *macroeconomic growth* perspective, the evidence base for linkages with green growth is weak. Key opportunities for further research include:
    - What are the macroeconomic effects of green growth strategies, e.g. GDP, employment, competiveness and trade effects? This could be assessed with Computable General Equilibrium models (national, regional and global) alongside assessment of employment effects and trade (and competiveness) analysis.
    - What are the input–output coefficients for net job creation in green growth sectors, bearing in mind that job creation has to be seen as only part of the benefits (and incentives) and that the distribution of profit and rent will also be important for assessing the next benefit of policies on society, the economy and the environment?
    - What are the constraints related to access to finance for up-front investments in South Asia, particularly in relation to capital-intensive sectors?

6.1.2 Social inclusion and poverty reduction

- In terms of *social inclusion and equity*, the evidence base for linkages with green growth is weak, in particular in the following areas:
    - What are the processes and benefits to mainstreaming green growth elements into welfare systems and social safety nets?
    - What is the distribution of the benefits and costs of green growth, particularly in relation to poor and vulnerable populations?
    - What are the potential resource price adjustments associated green growth that would need to be offset and do countries have this capacity?

6.1.3 Climate resilience and environmental sustainability

- In terms of *climate resilience and environmental sustainability*, the linkages with green growth are weak. The following emerged as areas with a weak evidence base:
    - What are the macroeconomic and economic costs of current climate variability and future climate change, i.e. how important might the reduction in growth be under different future scenarios (e.g. a 2°C or 4°C world)?

- Is there synergistic potential for reducing emissions (low carbon) and increasing resilience at the sectoral (national) level? What is the appropriate balance of investment in resilience (adaptation) versus mitigation, given the longer-term nature of climate change and the high uncertainty involved, and are there greater benefits from investing in short-term resilience to reduce the existing adaptation benefits?

- How can we exploit the synergies (e.g. in agriculture) and address the trade-offs (in energy and the built environment) between low carbon and climate resilience, both in terms of the technical options but also in relation to the institutional and governance barriers?

- What is the economic value of ecosystem services, and more importantly how can these be used at a macroeconomic planning level to help build the case for green growth, taking into account their non-market nature?

- What are the external costs (e.g. of air pollution) now and in the future, and how much might these be reduced under green growth strategies? Is there the potential to internalise these without affecting competiveness or leading to social conflict?

6.2 Research institutions and platforms

6.2.1 National institutions

Green growth is seen as a multi-disciplinary research theme. While many institutions exist that address one or another aspect, there are few that bring together the necessary skill sets to understand the complex dynamics.

It is important to highlight that this has been a rapid assessment of the research capacity in the different countries and in the region related to green growth, based mostly on the knowledge of the country researchers and of the stakeholders interviewed. It aims to be as inclusive as possible, however it is in no way exhaustive, nor it is an evaluation of the work of individual institutions.

The main key national institutions identified include:

- Afghanistan:

  - *Growth, policy, development:* Centre for Policy and Human Development, Afghanistan Public Policy Research Organisation, National Centre for Policy Research, Afghanistan Institute for Rural Development (AIRD)

  - *Green growth and climate change*: no specific institution

  - *Universities*: Kabul University (different faculties, including: Geo-Science, Agriculture)

- Bangladesh:

  - *Growth, policy, development:* Bangladesh Institute of Development Studies (BIDS), Centre for Policy Dialogue (CPD)

  - *Green growth and climate change:* Centre for Environmental and Geographic Information Services, Centre for Natural Resource Studies, Environment and

Population Research Centre, Society for Environment and Human Development (SEHD)

- *Universities:* Dhaka University, North South University, Chittagong University

- India:
  - *Growth, policy, development:* Tata Institute of Social Sciences, Centre for Policy Research (CPRI), Institute of Economic Growth, Indira Gandhi Institute of Development Research
  - *Green growth and climate change:* TERI, Sardar Swaran Singh National Institute of Renewable Energy, Divecha Centre for Climate Change, Centre for Science and Environment, Indian Climate Research Network, Indian Institute of Tropical Meteorology, Indian Agricultural Research Institute, Forest Research Institute, Dehradun
  - Indian Institute of Forest Management, Bhopal
  - *Universities:* Indian Institute of Technology, Delhi University
- Nepal:
  - *Growth, policy, development:* Institute for Policy Research and Development, Nepal Institute of Development Studies.
  - *Green growth and climate change:* Institute for Social and Environmental Research.
  - *Universities:* Kathmandu University, Tribhuvan University.
- Pakistan:
  - *Growth, policy, development:* Pakistan Institute of Development Economics, Economic Evaluation and Research Centre, Institute of Policy Studies.
  - *Green growth and climate change:* Lead Pakistan.
  - *Universities:* National University of Science and Technology.

6.2.2 Regional institutions

From a regional perspective, a number of potential research networks and enabling institutions were identified, including: South Asian Network for Development and Environmental Economics (SANDEE), Asia Energy Institute, South Asian Association for Regional Cooperation (SAARC), and International Centre for Integrated Mountain Development (ICIMOD).

7 Conclusions

This report has set out the findings of the project 'Scoping Green Growth Challenges and Opportunities in South Asia', with research in five countries (Afghanistan, Bangladesh, India, Nepal and Pakistan). The objectives of this study were to assess the relevance and effectiveness of green growth initiatives in South Asia, to understand the status of regional and national green growth strategies, and to analyse their compatibility with traditional and emerging country growth models. Also, to provide broad evidence of what is and is not working, to identify initial challenges and opportunities that green growth poses for poverty reduction in the region, and to map out key institutions carrying out research on green growth in the region.

'Green growth' is a relatively new concept without, as yet, a single definition. Broadly, green growth implies alignment between development, environmental and social improvement by adopting a planning approach that shifts public and private expenditure from BAU towards a green economy path. It has relevance for different sectors, in particular LULUCF, the extractive industries, agriculture, energy, industry, transport, infrastructure, and health and education.

The status of the progress of green growth policies in South Asia varies in the different countries. There is in general more attention on 'green' elements in planning and policy-making in South Asia, leading to a diverse range of models based on country characteristics and priorities. In some countries, there is a departure from traditional growth models, while in others the tendency is to incorporate green elements in traditional policies.

The evidence base is varied too. While research is increasing and so are approaches based on more rigorous evidence, the effectiveness of these efforts varies. It appears that the tendency is to paint a positive image of green growth, but underlying analysis of costs and benefits and winners and losers is often lacking or insufficient.

Broad findings from this analysis include:

- **On growth, employment, trade, and competiveness**: The evidence indicates that green growth policies will result in higher levels of long-run GDP growth, both from avoided costs of climate change but also from the development of new sectors. However, the timing and distribution of costs and benefits in the short run remains a challenge.

- **On poverty reduction:** green growth can be supportive of poverty reduction when activities are aligned with traditional community-led sectors, provide access to cost-efficient pro-poor technologies, or provide direct employment opportunities; otherwise, the costs for inclusion will need to be taken into account and safety nets may be necessary.

- **On resilience and the environment:** at the global level, there are obvious synergies where green growth reduces the impacts and economic costs of avoiding future climate change, and also reduces pollution and pressures on the environment. However, domestically, trade-offs or benefits will depend on the sector of analysis. Strong synergies exist in the forestry and agricultural sectors, while potential conflicts exist in the energy sector and in urban planning. Also, while there are benefits in terms of enhanced natural capital, these positive effects will not be recognised in short-term current metrics such as GDP. Moreover, internalising externalities may affect prices, which may affect investment and competitiveness.

There is ample space for further research. Green growth research is still in its nascent stage, so there are numerous topics that need to be explored. In particular:

- **In terms of macroeconomic growth:** the macroeconomic effects of green growth have not been sufficiently researched, and the impacts on employment also require further analysis.

- **On poverty reduction**: there is often the expectation that economic growth will also lead to poverty reduction, but instead it can increase poverty and vulnerability. Safety nets may therefore be required, but research on the costs and subsequent uptake by the countries may require further research.

- **On resilience and the environment:** there is a need for more analysis on the macroeconomic and economic costs of climate change and weather variability in different scenarios, of investment needs, on synergies and trade-offs, and on environmental costs.

Some lessons are emerging. There are increasing country and case studies that provide evidence of what works and what does not, although these are still context-specific and generally it may be still too early to make assessments.

There is increasing research expertise on green growth but implementation capacity is low. There are numerous research institutions at the country level, and some regional organisations that work on climate change and green growth issues. There are opportunities to tap into and strengthen their capacity in rigorous research, in addition to building regional coordination, in order to provide stronger assistance to governments.

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Annex A Stakeholder interviews and documents reviewed

Stakeholder interviews	Strategies, policies and laws screened
Afghanistan	
Mr Ahmed Shah, Internal Auditor, World Bank Mr Amulya Das Shrestha, UNOPS/MPW, Afghanistan Rural Access Project (ARAP) Mr Samee Ullah, ARAP Mr Nematullah Haidari, Research Specialist at UNDP Mr Mojeeburahman Stanikzai, Expert at ARAO Mr Tariq Nasery, Water Resource Engineer at Ministry of Public Works	The National Capacity Needs Self-Assessment for Global Environmental Management and the NAPA, 2009 ANDS (2008–2013) Afghanistan Agriculture Master Plan, 2008
Bangladesh	
Dr Aminul Islam, Senior Adviser on Sustainable Development, UNDP Dr Liakat Ali, DFID Mr Abdul Quayyum, Director, CDMP Mr Arif Faisal, Environment Specialist, ADB Dr Nadia Sharmin, Environment Specialist, World Bank, Dhaka Dr Asaduzzaman, Research Director, BIDS Professor Dr. Shamsul Alam, Member, Planning Commission	National CCSAP, 2009 National Adaptation Plan of Action, 2005 The 6th Five-Year Plan FY 2011–FY2015, 2011 The Perspective Plan of Bangladesh 2010–2021, 2010 National Environment Management Action Plan, 1995 The National 3R Strategy for Waste Management, 2010 Recent Reform Initiatives of Bangladesh Bank, 2012
India	
S Vijay Kumar, Distinguished Fellow, TERI (former Secretary Ministry of Rural Development) Dr Pradipto Ghosh, Distinguished Fellow, TERI (former Secretary, Ministry of Environment and Forest) Dr Kanchan Chopra, Ex. Dir. Institute for Economic Growth (IEG) Dr Kirit Parikh, Director, IRADe Seema Arora, Executive Director, CII Dr Ashok Khosla, Chairman, Development Alternatives	NAPCC, 2012 Low carbon strategies for inclusive growth, 2014 12th Five-Year Plan, 2012 National Mission for Sustainable Agriculture, 2014 Energy Conservation Act, 2001 Integrated Energy Policy, 2006
Nepal	
Prof. Dr. Govind Nepal, NPC Dr Madan Pariyar, Former Chairperson High Level Commission for the State Restructuring in Nepal Prof. Dr Pushkar Bajracharya, former NPC Mr Sharma, Donor	Climate Change Policy, 2011 The Strategic Programme for Climate Resilience, 2012 NAPA, 2010 Approach Paper to the 13th Plan 2013/14–2015/16, 2013 Agriculture Development Strategy (Draft), 2014

Keshav Kanel, former Director General, Department of Forests Mr Parashu Ram Adhikari, Undersecretary. Ministry of Agriculture Development Mr Madhukar Upadhyay, former NPC	District Forest Strategic Plan (Draft), 2013 Environment Friendly Local Governance Policy, 2010 District Climate and Energy Plan, 2013
Pakistan	
Mr Irfan Tariq, Director General, Ministry of Climate Change Mr Hameed Marwat, Chief Environment, Planning Commission Mr Ali Tauqeer Sheikh, CEO Lead Pakistan Mr Mirza Muhammad Ali, Vice President Chamber of Commerce Dr Bashir Khan Marwat, Director General Environmental Protection Agency (EPA), Khyber Pakhtunkhwa Environment Department Mr Shakeel Ahmed Ramay, Head of Compliance Unit, Sustainable Development Policy Institute Mr Ahsan ullah Khan Kundi, Programme Associate Global Environment Facility	NCCP, 2012 NSDS (Draft), 2012 The Tenth Five-Year Plan 2010 – 15, 2010 National Forest Policy, 2010 National Environmental Policy, 2005 National Drinking Water Policy, 2009 Vision 2030, 2005

Annex B Thematic questions for the research phase

Policies, programmes and capacity

- How does the government or ministry define green growth and is it an explicit objective in policy-making?
- What is the process for mainstreaming green growth and climate change in development plans and sector strategies?
- What are the specific tools, policy instruments and activities used by government to promote green growth?
- What are the potential barriers to implementing green growth in national development plans/sector strategies?
- What is the level of institutional capacity on green growth issues and is this an issue in delivery and implementation?

Macroeconomic perspectives

- What are the trade-offs between environment and growth and how are these being addressed by the government?
- Does green growth align with conventional growth policies or open up new areas for economic development?
- Does the government assess the impact of climate change and costs of action in terms of GDP and economic growth?
- How are the implications of green growth/climate change for budgeting, revenues and expenditure being assessed?
- What financial support exists for green growth and are there incentives for the private sector/non-state actors to invest?
- Do sector development plans promote green sectors as a strategic focus of economic development and job creation?

Social and poverty perspectives

- What are the potential opportunities and challenges of green growth for poverty reduction and social inclusion?
- How is the distribution of the benefits and costs of green growth for vulnerable groups monitored and managed?
- Do long-term green growth mechanisms, pathways and targets assess the potential social impact?
- How are green growth activities integrated into social development policy or welfare safety nets?

- How does the social protection system react to resource and commodity price adjustments (e.g. energy, water)?

Resilience and environmental perspectives

- How are concepts of climate resilience included in national development/sector plans and how are they monitored?
- Are all policies, programmes and projects screened against potential climate risks and opportunities?
- How are long-term climate change projections used in planning to minimise risk and improve decision-making?
- Are adaptation and mitigation policies designed and delivered in an integrated way, with co-benefits maximised?
- Are environmental costs/benefits considered in planning processes (air and water quality, waste, ecosystems, etc.)?

Research opportunities

- What are the weaknesses in the underlying evidence base for green growth policy and how could these be improved?
- Which research institutions are engaged in green growth, climate change and economics?
- What regional networks exist that could support green growth research?

Annex C Policy screening template

Analysis	Does the policy or programme…	Rating	Detail
Internalising environmental externalities	Levy fees or taxes on pollution or resource use Support cap and trade, pollution permitting or certificate systems	Strong Moderate Weak NA	Examples of how this is achieved
Incentivising third-party environmental investment	Support investment incentives for green activities (low interest, micro finance) Provide subsidies, feed-in tariffs or other direct support for green goods Remove distortions and perverse incentives (e.g. fossil fuel subsidies) Leverage finance for green investment (PPPs, guarantees, FDI)	Strong Moderate Weak NA	
Building green institutional and legal capacity	Introduce green regulations (standards, disclosure, labelling, enforcement, targets) Support property rights and access laws Develop governance/institutional capacity for sustainable development/climate resilience	Etc.	
Investing in sector sustainability and skills	Support public procurement programmes for green purchasing Invest in natural capital (protected areas, rehabilitation, Payments for Ecosystem Services etc) Invest in sustainable agriculture Invest in human capital (training on environmental knowledge and skills) Invest in green infrastructure (energy, water, waste, ICT, transport) Invest in green innovation, R&D Invest in climate resilience and adaptation		
Raising environmental awareness and understanding	Promote green information sharing, education, CSR, labelling, targets Measure progress – green targets, inventories, accounting approaches		
Social inclusion and protection	Promote green skills retraining and job search Provide social protection for impacted groups (price rises, climate impacts) Mainstream green activities in social and welfare to work programmes		

Annex D Detailed country analysis

This annex contains the findings from the desk review of relevant literature, from the policy screening, and from the interviews conducted with the different stakeholders.

D.1 Afghanistan

D.1.1 Policies and programmes

In institutional terms, an independent NEPA was established in 2005, being elevated from a department previously established in the Ministry of Irrigation, Water Resources and Environment. The country's growth strategy is directly driven by the president through a dedicated oversight committee and the relevant sector ministries. The NEPA takes the primary role in climate change-related policy-making, and acts as a coordinating body with other institutions.

From a policy perspective, there is no overarching green growth strategy, and limited explicit green growth objectives set out in sector sub-strategies. The main growth strategy is the ANDS 2008–2013.

- The ANDS strategic vision contains a number of green growth elements. It aims to improve the quality of life of the people of Afghanistan through conservation of the nation's resources and protection of the environment. Goals include to secure a clean and healthy environment and to attain sustainable economic and social development while protecting the natural resource base and the environment of the country; and to ensure effective management of the country's environment through participation of all stakeholders. Environmental protection is considered one of the cross-cutting issues in the ANDS. It sets out that government, donors and implementing agencies follow established environmental best practice with respect to the design and monitoring of social and economic development projects. It also provides guidance that environmental costs should be accounted for in appraisals. Specific activities include: the restoration and sustainable use of rangelands and forests; conservation of biodiversity; preservation of natural and cultural heritage sites or resources; encouragement to community-based natural resource management, prevention and/or abatement of pollution; and improved environmental management, education and awareness. The ANDS has a strong focus on water efficiency and management to support the agriculture sector. From a capacity-building perspective, the ANDS focuses on developing NEPA's capacity to perform its regulatory, coordination and policy-making duties, as well as supporting the capacity of line ministries to improve their EIA capacity.

The Environment Law (2005) is the key policy document relating to environmental issues. The key climate change-related documents include the NAPA and its supporting documents, the First National Communication to the UNFCCC and the Strategic National Action Plan for Disaster Risk Reduction (2010).

- The NAPA sets out some priority programmes associated with climate resilience. Two priority projects were developed – 'Improved Water Management and Use Efficiency' and 'Land and Water Management at the Watershed level'. These were established as standalone initiatives rather than mainstreamed into government policy. The NAPA has served to raise awareness of climate change among key constituencies, and to build institutional capacity to respond.

Sector strategies also include elements of green growth. The Initial National Communication sets out some of the activities across a range of sectors, including low carbon energy sector development (hydropower development), improvement of mass transport systems, forest and rangeland management, waste management and clean air regulation. For example, the Afghanistan Agriculture Master Plan proposes some elements that support natural resource development (afforestation, watershed rehabilitation, nursery development, and land reform), but the focus is more on mainstream sector development and finance. It is not clear to what extent the high-level greening and sustainability objectives within the ANDS have been operationalised across the broader sector strategies.

Stakeholders report little longer-term strategic thinking about the impacts and opportunities of climate change in relation to macroeconomic and sector planning. New sector strategies are beginning to adopt green growth principles, but implementation remains an issue. Green growth policy-making is primarily being driven through the enforcement of donor-led environmental safeguards and screening approaches to protect social and natural capital. Donor agencies like the World Bank and ADB make detailed assessments of the impact of their infrastructure projects on the environment (including climate change) and take necessary steps to minimise/mitigate them. The United Nations Office for Project Services (UNOPS) deploys a policy for sustainable infrastructure. Donors seek to mainstream green growth concepts in their programming, but are constrained by competing development objectives.

In terms of barriers to implementation, Afghanistan remains a fragile state and presents a difficult operating environment for planners. Institutional capacity remains weak, with a lack of coordination among different governmental organisations. Stakeholders indicate that NEPA has a weak influencing role among other line ministries. There is limited awareness of green growth, a lack of commitment in general to environmental objectives and limited capacity for implementation. United Nations agencies and other donors are supporting government authorities to build capacity around environmental and green growth objectives. Examples include UNOPS' strengthening of the capacity of the Environment and Social Management unit in the Ministry of Public Works.

D.1.2 Macroeconomic perspectives

Growth is a key objective within the ANDS. Currently, development is pursued through an almost entirely traditional growth model. From a mitigation perspective, respondents indicated that the additional costs and delivery challenges of green technologies might be outweighed by the need to provide rapid economic development. More than one respondent talked about the 'front loading of costs' as a particular challenge given Afghanistan's resource constraints. There is currently no integration of climate change considerations in budgeting and expenditure analysis. There has been no attempt to achieve green growth policies through the tax system using fiscal instruments in order to engage the private sector (e.g. low interest loans, tax relief, and export and import duties). Respondents felt overwhelmingly that, while a coherent approach to green growth was both desirable and possible, currently the agenda was only of interest to donors, with one calling it a 'fancy expression'. Awareness and commitment to moving to a different growth path both remain low among Afghan policy-makers.

D.1.3 Social and poverty perspectives

Poverty reduction is a key objective of the government, both from a development and a security perspective. Donors typically prioritise poverty reduction in their growth strategies and development programmes. While the potential for environmental degradation associated with unconstrained growth was recognised by respondents, access to jobs, energy and infrastructure were considered of greater importance. There are, however, some areas where poverty reduction and green growth were seen as being fundamentally aligned. The use of solar photovoltaic lighting

for off-grid communities is now developing quickly, and to a lesser extent renewable energy-based agricultural technologies (e.g. pumps). One respondent recognised the potential to use green climate funds to support social inclusion and health (e.g. solid waste management, sanitation, urban traffic pollution).

D.1.4 Climate resilience and the environment

From a resilience and environmental perspective, programmes funded by donors tend to undergo some level of climate and environment risk-screening process as part of their development and approval. Environmental governance and enforcement remains weak however. Plans for climate resilience have been developed by international partners (e.g. in the NAPA), although their implementation remains patchy. A number of resilience-oriented initiatives have been implemented from a programmatic perspective (primarily in agriculture and water). Respondents felt that the government had not yet fully mainstreamed climate considerations into the development strategy itself.

D.1.5 Research opportunities

Respondents report that a number of ministries have undertaken green growth-related research to support policy formulation. The National Environment and Forest Protection Directorate under the Ministry of Agriculture was identified as a department with a specific interest in the subject. However, there is little or no evidence base for how well such policies have been implemented or what the results have been. A lack of technical capacity to undertake research and monitoring, together with the costs of doing so, mean that evidence remains a constraint.

D.2 Bangladesh

D.2.1 Policies and programmes

Green growth is a term widely used in Bangladesh. The meaning and usage of the term, however, can be very broad and ill defined. Stakeholders have differing views on its meaning. Sometimes it is regarded as the minimisation of environmental degradation associated with economic development (e.g. environmental protection). In other circumstances, it can tend more towards longer-term low carbon development (e.g. the CCSAP). Sometimes the concept is confused with the sustainability of growth itself.

From an institutional perspective, environmental policy is managed through MoEF. The Five-Year Plan initiated by the Planning Commission activated the National Environmental Council, which is a cross-sector body headed by MoEF. In addition, environment committees have been established at Division, District and *Upazilla* levels.

The Government of Bangladesh does not have a separate green growth strategy, although the NSDS (2008) brings together many of the concepts. A number of core plans and strategies address various aspects of green growth. Economic growth and development policies are set out in the sixth Five-Year Plan (2011–2015) and the Perspective Plan Bangladesh (2010–2021). Both have green elements mainstreamed within them. The Bank of Bangladesh has also promoted a series of green growth reforms.

- Chapter 10 of the sixth Five-Year Plan elaborates the green strategy. The focus is primarily on incentivising environmental behaviour and building institutional capacity. The Plan commits to building capacity to mainstream poverty, the environment and climate change into development planning, budgetary processes and project implementation and monitoring. Specific initiatives are set out, such as tax rebates for environmental

businesses. A number of institutional and regulatory reforms to be undertaken reflect emerging environmental issues and conventions, particularly in regard to the Department of Environment and related activities. There is also a commitment to strengthen EIA guidelines. However, the Plan lacks specific detail in terms of an actionable agenda.

- The Perspective Plan of Bangladesh (2010–2021) sets out a long-term development strategy and seeks to balance the opportunities for environmental improvement against economic growth and poverty reduction concerns. Chapter 13 provides the environmental strategy, which is generally strongest in its sector strengthening ambitions. The Plan seeks to promote the mainstreaming of environment, climate change and disaster management across government to benefit the poor. It mandates the Planning Commission and other agencies to build national and local-level capacity to improve climate resilience, particularly in relation to disaster management. From a sector perspective, the Plan promotes biodiversity through a National Assessment and Action Programme, afforestation in the coastal areas to protect against storm surge, integrated coastal zone management and land desalinisation. Health and sanitation are also covered. The focus is on protecting vulnerable communities and linking disaster risk reduction and climate change with social protection and economic development.

- The Bank of Bangladesh's reform initiative (2012) sets out a range of support measures to enable green growth. Chapter 9 targets activities that deliver positive environmental activities. The bank has developed a green banking cell, and introduced a refinance scheme worth BDT 2 billion (USD $25 million) to refinance loans for effluent treatment plants, solar panels, biogas plants and HHK technology in the brick-making industry at a 5% interest rate. On-lending by banks and other financial institutions is provided at a 9% rate (compared to an average 13% market rate). It also integrates an assessment of green management when awarding ratings under the CAMELS system.

The NSDS (2008) was supported by UNEP and marks Bangladesh's first attempt to define an integrated green growth strategy. The strategy seeks to 'ensure sustained economic growth, environmental protection and social justice which implies improvement of livelihood options of the people, reduction of poverty; ensuring wise use of natural resources, good governance and people's participation'. It sets out a development vision to 2030. The NSDS has four priority areas – sustainable economic development, agriculture and rural development, social security and protection, and environment and natural resource management. Bangladesh has comprehensive environmental rules and regulations (managed through MoEF). The use of EIAs is mandatory. Projects are traffic light-coded on the basis of their potential environmental impact. Recently, the government has required to identify potential negative environmental, climate and disaster risk reduction impacts arising from any proposed projects, together with potential mitigation strategies.

There were early examples of mainstreaming, such as the Coastal Zone Policy and National Water Management Plan, but this process was consolidated through the NAPA (2005) and more recently the CCSAP (2009).

- The NAPA explores the vulnerability of Bangladesh to climate change and disaster risk. Prepared in 2005 with 15 projects, it was updated in 2009 to include 45 programmes. The thematics around capacity building and knowledge generation are similar to those set out in CCSAP with a focus on protecting vulnerable groups. Growth aspects are tangentially addressed through specific sectoral interventions, such as supporting agricultural and fisheries production through the use of flood- and saline-resistant crops and species. Insurance mechanisms are also explored as a risk management mechanism.

- The CCSAP identifies three climate hazards – tropical cyclones/storm surges, inland flooding, and droughts. The strategy contains 44 programmes formulated around six themes: food security/social protection/health, comprehensive disaster management, infrastructure, research/knowledge management, mitigation/low carbon development, and capacity building/institutional strengthening. The plan is estimated to require US$ 500 million in the first two years and then approximately US$ 5 billion for the first five years of implementation. The focus is heavily oriented towards vulnerable communities. Examples of activities include developing early warning systems, improving climate modelling capacity, developing biodiversity monitoring, and disaster forecasting. Specific initiatives are included on health, community adaptation and social safety nets. One area of specific green growth alignment is the commitment to better understand the macroeconomic impacts of climate change on the economy of Bangladesh, although it is not clear what work has been undertaken as a result. There is also a discussion about improving the resilience of agricultural systems to ensure economic development and food security.

These policy frameworks support a number of programmatic and financing structures. The Bangladesh CCSAP (2009) saw the operationalisation of a National Climate Change Fund. The Bangladesh Climate Change Resilience Fund (BCCRF) was also established as a multi-donor trust fund to coordinate development partner activities. Stakeholders report that a National Environmental Fund will be established in order to provide assistance to the victims of environmental degradation caused by natural disasters and anthropogenic activities.

The process of mainstreaming green growth concepts in sector strategies and plans has been somewhat slower. There is some government-level support for the development of renewable energy, water management and pollution control. However, stakeholders indicated that GHG mitigation initiatives are not well integrated with wider economic policies. As a result, the ADB is currently working to develop a holistic framework for climate change mitigation. In addition, UNDP is currently working with 23 institutions to build technical and research capacity to develop green technology.

Policy-makers are in general well sensitised to the broader concept of low carbon growth and environmental protection, and there is a relatively high level of awareness. A lack of technical capacity to implement green growth policies and plans was identified by many respondents as a key constraint. The long-term costs and benefits of green growth development are not well understood by policy-makers and the evidence base is weak. Both the technical capacity of the Department of Environment and its ability to influence other line ministries are considered issues. Respondents also highlighted that the lack of technical knowledge resources (e.g. a standardised national vulnerability index) may impede Bangladesh accessing international climate finance going forward. Access to resources and the higher costs of green technologies are also considered potential barriers. One of the major constraints in promoting green growth in Bangladesh is the availability and cost of green technology transfer.

D.2.2 Macroeconomic perspectives

Respondents indicated that traditional growth models still dominate government thinking, despite the extensive work that has been undertaken on climate mitigation, resilience and finance in the country. Some activities associated with sustainable growth (e.g. off-grid renewables, social forestry, waste management, etc.) are well developed and promoted within government programmes. Sector policy covers a diverse range of issues, including the following: Bangladesh Environment Policy 1992, Forest Policy 1994, Water Policy 1999, National Land Use Policy 2001, National Fisheries Policy 1998, and National Environment Management Action Plan (NEMAP)

1995.[27] Stakeholders generally cited a lack of evidence on the trade-off between growth and the environment and the distribution of costs and benefits over time.

From a long-term economic planning perspective, there has been some work to identify the GDP implications of both low carbon growth and climate impacts/resilience, but not in an integrated way across the economy. The World Bank undertook a study on the Economics of Climate Change, which identified the benefits of the US$ 10 billion of resilience work (both structural and non-structural) undertaken in Bangladesh since 1960. Despite this work, the direct economic costs of climate change are estimated at 0.5% to 1% of GDP annually without the costs of loss of life. The economic impacts are expected to worsen over time, with impacts on agriculture alone increasing to US$ 2.9 billion per annum on average over the period to 2050 (World Bank 2010).

For example, there has been a national-level loss and damage assessment following the Durban meeting and CDKN has recently undertaken a review of the impacts of climate change on agriculture and food security (CDKN, 2011). However, the capacity to undertake such modelling within Bangladesh is not strong. An integrated framework to map the costs and benefits of green growth over time is missing, and policy-making is undertaken based on limited information.

From a medium-term budgeting perspective, the Government of Bangladesh has developed a Climate Public Expenditure and Institutional Review (CPEIR) (GoB, 2012) and is currently developing a climate fiscal framework, while UNDP is supporting the government in mainstreaming an environmental and climate change coding methodology into the budget system to allow the quantification and tracking of relevant fiscal expenditures. The initial assessment detailed in the CPEIR indicated that approximately 7% of total public expenditure contributed to green growth type activities. The introduction of a climate budget code is creating a level of transparency, but there is scarce evidence as to whether this information has improved policy-making or the allocation of finance. For example, in 2011/12 around 45% of planned climate-sensitive expenditure was not referenced in the Ministry Budget Framework of most ministries involved in climate-sensitive activity, thereby removing a significant proportion of this expenditure from the performance management architecture and disconnecting climate policy at the operational level.

The private sector is provided with incentives to opt for environmentally friendly technologies. For example, duties on green technologies have been reduced. The machineries and raw materials imported to set up waste management capacity also involve a very low level of duty compared to other machinery. Environmentally compliant industries also receive direct and indirect benefits from government. Moreover, the removal of VAT from the purchase of identified clean technologies has been proposed in the current fiscal budget of the government.

D.2.3 Social and poverty perspectives

There is evidence that the poor are meeting the costs of climate change already. The World Bank suggests that damages from climate change are geographically concentrated in those areas with higher levels of poverty (World Bank, 2010). The poor in Bangladesh live in poorly constructed houses susceptible to storm surge, cyclones and floods. In addition, rural households typically depend on climate-sensitive sectors for their livelihoods and their limited asset base means it is difficult to recover in the face of a natural disaster. About 80% of losses in agriculture fall directly on household consumption and have severe household welfare implications. The southern coastal regions and the north-western regions are expected to experience the largest income declines (World Bank, 2010).

[27] However, some policies, such as the Export Policy (2006) and Industrial Policy (2005), have components that sometimes conflict with climate change concerns.

Poverty alleviation remains the most important policy priority for the Government of Bangladesh. While one respondent indicated that it was too early to implement green growth until basic social needs were met, others indicated that there is already a high level of alignment between social and green growth policy in Bangladesh. Bangladesh is still a subsistence economy based on indigenous technology. In most cases, growth policy is focused on scaling up these activities and promoting self-employment in rural areas using non-intensive technologies.

There is some concern that rapid economic growth will disrupt this subsistence model (indirectly leading to an intensification of agriculture and industry), and benefiting relatively wealthier and more skilled workers. The replacement of labour with capital-intensive machinery may have negative social policy (as well as economic) consequences, although the long-term employment effects are poorly understood at present. Given the limited formal linkages between social and green growth policy, there are no monitoring mechanisms in place to assess the welfare and distributional effects of potential green growth policies. The NSDS does not have integrated monitoring mechanisms for the more general social protection policies (although a monitoring framework is available to ensure macroeconomic stability in the context of promotion of good governance).

A number of green growth opportunities that would align growth with a social inclusion model were identified by respondents. These include the promotion of renewable energy policy, the move towards greater energy efficiency, and e-technology (e.g. mobile banking). Other potential green investment opportunities (such as mass transit schemes and ecosystem service approaches) were also identified as potential future areas of social–green growth alignment.

While social safety net programmes in Bangladesh are not explicitly designed to promote green activities, they nonetheless include activities that support the green growth agenda. The first role is preventative in the sense that they prevent the poor from carrying out activities such as cutting trees, capturing wildlife etc. to sustain their livelihoods. There are examples of a positive correlation between participation in social safety nets and improved environmental behaviour (Chowdury, 2008). The second role is promotional in the sense that, by using different safety net programmes, the poor are involved in building green assets like planting trees, digging ponds or irrigation canals. For example, the World Bank is helping the poor in the Char lands to produce pumpkin without irrigation, so that they reduce the impact on the environment. Another example is crab farming, which promotes biodiversity as well as provides livelihoods for the poor. The Government of Bangladesh is also using microfinance institutions to provide credit support to the poor for environmental activities. From a resource perspective, Bangladesh does operate a system of progressive price adjustments for commodities such as electricity and fossil fuels for the poor.

D.2.4 Climate resilience and the environment

Every project at sector level in Bangladesh requires an EIA, with proposals obliged to include a discussion of probable environmental risks and mitigation actions. The government does use some level of climate risk screening, although this is normally implemented on an ad-hoc basis at the insistence of specific government advisers or donors. As a result, respondents report that resilience is as yet poorly integrated into mainstream development planning. While the National Development Plan includes climate change, it provides no actionable guidance.

Respondents report that climate risk analysis and programming tends to be concentrated within the established climate-adaptation finance structures (i.e. the BCCRF, CCSAP and NAPA) and to date these approaches have not been fully mainstreamed. Some work has been undertaken in a few selected sectors. For example, the Ministry of Agriculture has developed both saline- and flood-tolerant breeds of rice, and is promoting the shift to a rainfall-based harvest due to evidence that ground water availability is in decline in certain regions. Community-level resilience planning is

considered a relatively strong aspect of development policy in Bangladesh. However, the broader picture is less positive and there remains broad scope to widen out these measures. Agrawala (2010) and Srinivasan (2008) both explore the benefits of climate-resilient programming and mainstreaming for Bangladesh, including more efficient policy implementation, improved financial leverage and avoided maladaptation (e.g. the 1999 floods saw people trapped inland by poorly planned flood defences).

Currently, the climate projection and impact models used for policy and programme development are considered inadequate by respondents, and a more rigorous approach is suggested. The meteorological and hydrological projections currently available are not of the quality or resolution to use for policy-making purposes. For example, the government's current Disaster Management Plan is derived from historic data. Respondents indicate that this is in part due to the lack of importance given to green growth as a policy objective by the government, resulting in a lack of commitment to expanding the research and evidence base. From an economic perspective, environmental externalities are rarely modelled in policy or programme appraisal. Economic analyses of the additional costs of resilience are considered weak.

D.2.5 Research opportunities

Stakeholders generally cited the weak evidence base as a major challenge for robust green growth policy-making. While a large number of studies have been undertaken on the components of green growth (i.e. economics, social development and environmental sustainability), the linkages between them are poorly understood. Current capacity constraints were identified in upstream climate and hydrological modelling, as well as in understanding the sector, economic and social impacts. The scale and distribution of benefits and costs of green activities and investment are not well modelled. A lack of funding and political will were identified as key issues.

Research institutions are engaged on aspects of these topics, particularly on climate change. Some donors (e.g. DFID) have been particularly active in promoting research. The Comprehensive Disaster Management Programme undertakes some work on green growth issues.

No regional networks were identified.

D.3 India

D.3.1 Institutions, policies and programmes

There is no single definition of green growth among Indian policy-makers, and it is not a concept in common usage among government representatives. The 12th Plan document talks of 'sustainable growth', which stakeholders consider a synonym of green growth. It stresses both social inclusion and environmental sustainability. Concepts include energy security, local environment and natural resource conservation. One respondent indicated that the lack of definition was deliberate in order to allow politicians the flexibility to be selective about their choice of policy implementation.

The MoEFCC and the Planning Commission are the key agencies with a remit for setting out the green growth agenda. The former manages environmental legislation and compliance, with the latter focusing on economic growth and low carbon development.

The sustainable growth concept makes up a large part of the 12th Plan document, which acts as a core funding and planning mechanism for both national and state policy. This represents the main channel for mainstreaming green growth concepts into the economic planning structure:

- The 12th Plan document subtitle is ‘Faster, Sustainable and More Inclusive Growth. India’s priorities for green growth are targeted at providing food and energy security, but also include actions on sustainable agriculture, waste management, resource efficiency and energy access, sustainable water provision, sustainable transport and green housing.

From a climate and environment perspective, India has been seeking to address environmental and social inclusion in its growth policies for a number of years. It has operated environmental governance structures (e.g. the Environment Committee and pollution control boards). EIAs are required for most projects. The key climate change policy is NAPCC (2008) and state action plans are in different stages of development in each state.

- NAPCC is a comprehensive document with eight thematic missions (energy efficiency in industry; water; green India; solar; sustaining the Himalayan ecosystem; sustainable habitat; sustainable agriculture; and strategic knowledge for climate change). Each of these missions has developed its individual strategy and activity schedule. Multiple elements of green growth are addressed in NAPCC, with the notable exception of social inclusion and protection. NAPCC includes activities to address environmental externalities (e.g. mandated energy consumption decreases in energy-intensive industries), increase investment (e.g. credit and insurance schemes for sustainable agriculture), improve regulation (e.g. develop a water efficiency target for 20% improvement), invest in sector sustainability (e.g. solar R&D programme) and awareness raising (e.g. the Strategic Knowledge Fund). There is a high level of alignment with economic development, although the macroeconomic implications are not set out or measured.

Different ministries may also have policies and laws with characteristics of green growth initiatives. For example, the Integrated Energy Policy (2006) and the Energy Conservation Act (2001) both mandate elements of renewable energy and energy efficiency. Under its Green Mission, India is investing INR 46,000 crore (US$7.6 billion) in forest conservation and reforestation projects with the aim of revitalising more than 10 million hectares of degraded forest area. The Ministry of Mines improved resource use efficiency though a zero-waste policy when the cut-off grade for iron ore was reduced from 55% to 45%. This resulted in a significant reduction in land use for mining. In the planning process, there has also been an emphasis on green growth; for instance, in the agriculture sector, through the better use of land and water by watershed development programmes and incentives to technologies like System for Rice Intensification or drip/micro irrigation. In the infrastructure sector, green buildings are being promoted. The Department of Industrial Policy and Promotion is promoting a green manufacturing policy and economic zones. The government is also looking to only approve clean technologies after a specific cut-off date and any non-conformance identified in proposed projects after that date would result in hurdles for clearances.

Stakeholders identified the additional capital costs of green infrastructure as an issue, given ongoing resource constraints and a lack of lifecycle cost analysis in budgeting and procurement. Connected to this, access to technology was also raised as a concern, underpinning India’s focus on (cost-effective) technology transfer in the international climate negotiations.

Although the green growth policy documentation, institutional structure and directives are fairly robust on paper, implementation nonetheless remains an issue. One stakeholder provided the example of the cleaning of the Ganga and Yamuna rivers, for which there have been action plans developed but little practical progress. Another identified the worsening situation regarding forest protection and management. Issues often arise in the implementation of programmes and projects, where natural resource and equity concerns may be sacrificed. Poor governance and corruption were mentioned as potential issues around implementation. Monitoring systems need to be improved.

Respondents identified a number of capacity and institutional barriers to green growth. Stakeholders identified a lack of knowledge and capacity among policy-makers and implementing agencies in regard to green issues. While senior representatives generally have a strong understanding, their ability to implement is hampered by the government staff rotation policy. Several capacity-building initiatives have been established, but progress has been slow. One respondent referred to the dependence on a small number of influential policy-makers (e.g. principal secretaries) to deliver progress. Once these individuals move on, momentum is often lost.

Respondents also noted the silo approach of the government. Environmental issues are managed by MoEF, but are poorly integrated with those institutions responsible for growth policy. Another challenge was identified as supporting policy-makers and academics from different disciplines (e.g. economics, environment, social protection, etc.) to cooperate and develop an integrated approach to green growth.

D.3.2 Macroeconomic perspectives

Most respondents supported the rationale for the alignment of the environmental and growth perspectives over the long term. Some technology approaches (particularly those with short payback periods and negative overall costs such as resource efficiency) were identified as win-win under all scenarios. One respondent highlighted a study on the Yamuna action plan that indicated that there would be fewer work days lost due to ill health with improvements in river quality. However, stakeholders recognised that the picture is a nuanced one. Respondents noted that trade-offs between environment and growth need to be assessed on a case-by-case basis and are often sector specific. There may be cases where both are not possible.

Policies that involve a paradigm shift to higher cost technologies are regarded as more challenging. Even within energy efficiency, one respondent contrasted the cost difference between CFL (negative-cost) and LED (low-cost) lighting. Another indicated that a fully green growth approach to the Indian power sector would only be possible from a policy perspective once full energy access had been delivered. It was noted that subsidies for GHG- and pollution-intensive sectors remain much higher than those supporting green sectors.

Examples were cited where environmental issues had negatively impacted upon economic development. One respondent identified the role of MoEF and the pollution control boards in creating environmental compliance delays for large project implementation. Another cited a study in Himachal Pradesh, which indicated that GDP would decrease marginally under an economic realignment to green sectors (tourism, agriculture and horticulture) away from industry and power generation (although the distribution of benefits would be more socially inclusive).

The challenge for policy-makers is that trade-offs are more likely to be identified at the project level through an EIA process rather than at a macro planning level. The balance and distribution of costs and benefits remains poorly understood. The temporal nature of these trade-offs was recognised (sacrificing short-term growth for longer-term sustainability). One respondent indicated that a lot depended on the government in power, with the new government seemingly more committed to addressing environmental issues in the growth agenda.

The potential for job creation was also raised by stakeholders as a potential trade-off. The potential for an increase in skilled labour was identified (e.g. in the green construction sector or through the use of the System for Rice Intensification in the agriculture sector). However, there were large doubts as to the impact of green growth on the number of net jobs. While new jobs would be created, they had the potential to displace those in existing industries. One stakeholder cited the lower labour intensity of solar power compared to coal mining and power generation, and the increasing automation of renewable technology production. An example was given of the

Government of India's solar mission in Rajasthan and Gujarat, where only limited employment was created. It was felt that further research would be warranted in this regard, particularly an input–output analysis to assess the potential for green jobs on a sector-by-sector basis.

The strength of the government's commitment to green growth was also questioned by some stakeholders. Concerns were raised about the international distribution of the benefits of green growth between developed and developing countries. A number of respondents indicated that green growth remains a third tier objective for the Government of India, behind economic growth or inclusive growth (including job creation/poverty reduction). Growth policy was seen as continuing to serve vested interests, with environmental concerns considered secondary. The financial viability of projects remained the primary driver in decision-making, with less weight given to environmental externalities or social justice. A number of examples that might demonstrate a less than full commitment to green growth were given:

- While adopting a voluntary target of improving emissions intensity by 20–25% by 2020 (excluding agriculture), India has opposed the adoption of binding or absolute emissions targets in the international climate negotiations in order to not impact upon the existing Indian competitiveness and growth model;
- Recent efforts by the Department of Industrial Policy and Promotion to lobby that certain manufacturers should be exempt from undertaking an EIA; and
- The lack of clarity of the roles and responsibilities for environmental compliance between the MoEF and implementing agencies under the new government, potentially weakening environmental compliance and enforcement.

Stakeholders were not aware of specific initiatives to measure the GDP effects of green growth at a national level. A significant proportion of GDP is already based around ecosystem services. The World Bank estimated that the total value of India's ecosystems was INR 1.4 trillion (US$ 29 billion) in 2009 or 3% of the total GDP for the year. Of these, wetlands account for approximately half (World Bank, 2013b). The Environment Minister and Statistics Office in India have indicated their intention to introduce green GDP estimates from 2015. The Ministry of Statistics and Programme Implementation set up an Expert Group in 2011 and this has produced a Framework for Green National Accounts in India. The government has commissioned Professor Partho Dasgupta to chair a committee to develop a methodology. Independent estimates of green GDP for India suggest that it is at least 5% lower than conventional GDP (World Bank, 2013b).

Respondents were aware of international work in this field, and the government intends to operationalise this though a pilot and gradually scale up the approach. The current evidence base is more at the project than the macro-sectoral level and therefore poorly designed for policy-making purposes. From a budgeting perspective, respondents were not aware of the mainstreaming of green growth or climate considerations into the budgeting tracking and formulation process. One respondent quoted a figure of 2.6% of GDP spent by central government on schemes that address climate variability either directly or indirectly.

From a sector support perspective, stakeholders recognised the support provided by government for individual sectors such as renewables, water and resource efficiency. There are a number of fiscal and regulatory frameworks, including accelerated depreciation of equipment for pollution control, wind power and feed-in tariffs for renewables. State support is provided to the pollution control boards.

However, some stakeholders regarded these incentives as being too limited in both scale and scope, and argued that in those sectors where significant progress was being observed the

primary driver was cost savings associated with resource efficiency (e.g. green buildings) rather than the fiscal incentives themselves. Where progress was limited, one issue was the failure to agree the burden share between government and the private sector to meet the marginal costs of more expensive green technologies. CSR was also identified as a non-government driver of green growth investment.

D.3.3 Social and poverty perspectives

The trade-offs and co-benefits between green growth and social inclusion are not uniform, and very much sector and location specific. Activities associated with access to energy (both solar photovoltaic and hydropower) were identified by respondents as supporting social inclusion and contributing to poverty reduction. Likewise, where green growth is pursued in terms of livelihood-based economic development (e.g. fisheries, forests, livestock, etc.), then the alignment of green growth and social policy is also regarded as less contentious. The Amul milk production project in Gujarat was cited as a successful example. However, one respondent warned against the 'romantic notion' that the poor are saviours of the environment, suggesting that often the subsistence model promoted by government policy could result in an inefficient and potentially damaging use of the environmental resources upon which they depend.

The evidence for the long-run benefits of sustainable growth for the poor remains weak, although some work has been done on the impact of general growth policies. Large projects generally require some level of social impact assessment within the EIA, and those projects funded by international donors generally require some analysis of distributional effects. One respondent indicated that green projects were generally exempt from environmental clearance by the MoEF, which would constrain the potential evidence base for positive social benefits from such projects.

The Green Growth in Practice report (GGGI, 2014) highlights the example of the Karnataka Watershed (Sujala) Project in India as a best practice example of an integrated environmental and social inclusion programme. The programme (focused on soil and water conservation) was aimed at supporting livelihoods and used a range of participatory techniques in its design and implementation to ensure the equitable distribution of benefits.

As set out in the previous section, there is some uncertainty among respondents as to the distribution of wealth benefits associated with green growth, particularly in relation to the potential to displace labour from resource-intensive industries. There are also concerns that new technologies and sectors will require a higher skill base that will marginalise non-skilled workers and result in skilled migration from other regions. One stakeholder suggested that government policy would continue to sacrifice social inclusion by exploiting cheap labour as a part of the economic growth model.

There was little evidence provided of the explicit mainstreaming of the green agenda into social welfare safety nets. However, there is some reference in the Mahatma Gandhi National Rural Employment Guarantee Act of building upon soil and water conservation projects as a core strategy.

D.3.4 Climate resilience and the environment

Respondents reported some use of climate and environment risk screening in policy and programme development. In general, systems for environmental risk screening are considered much better developed than those for climate risk and resilience screening, with the latter more recently introduced. While EIAs are compulsory, longer-term climate risks are not systematically included. The quality of environmental assessment tends to be more robust where external finance

or PPP structures are being used, with government projects tending to undergo a lower level of screening. The MoEF is responsible for ensuring screening is undertaken.

In terms of resilience screening, stakeholders report an early focus by government on the resilience of the agriculture and urban infrastructure sectors. At a project level, climate risk screening tends to be undertaken where there is strong donor input. Risk-screening approaches are being piloted in the Strategic Pilot on Adaptation to Climate Change. At a strategic level, it is expected that NAPCC and the sectoral action plans will form the basis of a broader cross-government risk assessment. This is expected to feed into the Planning Commission processes. However, respondents commented on the lack of certainty surrounding climate models and sector impact models for India, making it difficult to develop robust resilience plans. Considerable scope remains for improving modelling and undertaking sector impact studies.

D.3.5 Research opportunities

While respondents commented on the lack of certainty surrounding climate models, the following were seen as specific gaps in the evidence base.

- Defining green growth in the Indian context (expanding from low carbon development);
- Improving the robustness of climate and hydrological modelling;
- Applied research into sector solutions (e.g. cropping patterns, urban design policy, etc.); and
- Interdisciplinary research around the sub-components of green growth and their integration.

TERI was identified as one of the institutions with the greatest capacity to address green growth in a cross-disciplinary manner. The Indian Society for Ecological Economics was also identified as a good example of a cross-disciplinary research network. Other institutions had specific strengths. These included IIT Delhi (water resources), Pant Nagar Agriculture University (crop modelling), CSE and CPRI (policy research).

MoEFCC has committed to a series of measures to strengthen the scientific base and broaden its capabilities around climate change mitigation and adaptation. Steps include publishing a regular emissions inventory every two years, supporting the Indian Network of Climate Change Assessment (120 research institutions), supporting the GANGES advisory network, establishing a National Environmental Sciences Programme, and creating an expert committee to build the scientific capacity of MoEF and an Action Plan to Enhance Forestry Science.

The World Bank capacity-building programme (1998–2004) targeted institutions where research on economics was a focus to assist in capacity creation. The Indian Statistical Institute in Kolkata, the Indira Gandhi Institute for Development Research, the Institute of Economic Growth, Delhi and the Madras School of Economics started the earlier work. Government has a whole network of institutions like the IIFM in Bhopal, the Govind Ballabh Pant Institute of Himalayan Environment, and several others.

From a regional network perspective, the SANDEE and the SAARC Secretariat in Kathmandu were identified as potential platforms for regional networking and research on green growth issues.

D.4 Nepal

D.4.1 Policies and programmes

The concept of 'green growth' has not been explicitly defined by the Government of Nepal. Stakeholders generally understand the term to mean minimising the environmental impacts of the economic growth agenda and/or promoting environmentally and socially inclusive sectors (forestry, agriculture, renewable energy, etc.). There are a number of indications that this situation is changing. The National Approach Paper to the 13th Three-Year Plan sets out a focus on the green economy. GDP+ is being considered by the government as an economic measure (to include measurement of environmental welfare). A number of national-level workshops have been undertaken to explore the implications of a green growth concept. Nonetheless, green growth is broadly seen as part of the environment and climate change cross-cutting agenda area, rather than a standalone policy focus.

Green growth policy is shared among a number of institutions. The government convened the Climate Change Council in 2009. The NPC is responsible for setting the overall economic development framework through the three-year plans and associated approach papers. The MOSTE provides the focal point for climate change mitigation and resilience activities. Other line ministries (e.g. Ministry of Forestry, Ministry of Agriculture and Ministry of Energy) take responsibility for the mainstreaming of green growth elements in their sector strategy documents and plans.

Aspects of green growth (environmental, social and economic) are being addressed through a range of government plans. In terms of mainstream economic development, the NPC Approach Paper sets the planning framework:

- The Approach Paper of the Three-Year Plan FY2013–FY2013 contains a number of green growth type initiatives. It states that 'The implementation of development programs will be climate compatible.' For example, the use of heavy equipment is discouraged when undertaking community-based initiatives. Forest protection and community-based forest management are promoted and there is a commitment to REDD. Conservation of natural resources, environmental conservation and pollution control are all key themes. The Paper promotes the use of adaptive and efficient technologies in agriculture and supports the development of an agricultural technology research base. Resilient crop varieties and year-round irrigation are both to be promoted.

Core climate change policy is currently enabled by Climate Resilient Planning Framework (2013) and the Climate Change Policy (2011).

- The Climate Resilient Planning Framework (2013) was developed by the NPC to mainstream adaptation to climate change into the planning process. The Framework helps planners to understand climate projections and the associated sector impacts. Guidance on screening and risk assessment is provided. GHG mitigation is also included where there are co-benefits with adaptation (e.g. off-grid renewables and REDD). Community-level resilience and social protection are addressed.

- The NCCP (2011) was developed to improve livelihoods by adapting to the adverse impacts of climate change, adopting a low carbon emissions socioeconomic path and supporting and collaborating in the country's national and international commitments. The policy has three main areas of focus. First, it supports the mobilisation of financial resources through a range of measures including a climate fund and carbon trading to finance programme interventions. Second, the policy sets out actions for low carbon

development and resilience through sustainable growth, GHG mitigation activities and climate resilience planning. Third, the Policy supports capacity building, the participation of marginalised communities and knowledge sharing.

In addition, there are a range of further policies including Environment Friendly Local Governance and the Climate Budget Code. MOSTE is also in the process of developing a Low Carbon Economic Development Strategy. A NAPA and LAPA have also been developed.

At a sector level, the NPC has supported line ministries to mainstream green growth elements. The NPC Annual Circular sets out green growth and climate change components as priority areas for consideration by line ministries. In terms of sector policies, a number touch upon green growth, with those developed after 2010 more likely to reflect sustainable development concepts.

Some sectors have higher levels of green growth mainstreaming than others. For example, the forestry, agriculture and water/hydro sectors have relatively strong mainstreaming approaches. In the hydropower sector, the 13th Plan now requires the consideration of climate change in the development of large hydropower projects, extending the previous EIA mandate. In irrigation, the mainstreaming of climate change and disaster risk assessment is also mandated in project development. Other examples of good practice include the national forestry strategy, REDD and the agriculture development strategy. A climate change sector strategy for economic development in forestry and agriculture is currently being developed. Some other sectors' policies (e.g. industry, transportation and infrastructure) are less developed.

Policy-makers have also adopted green growth approaches at a local level. Examples of mainstreamed policies include the LAPA preparation process, local disaster risk management plans, district disaster management plans, district forest strategic plans, district forestry periodic plans, district climate and energy plans, district development committee periodic plans, and district-level agriculture development strategy/plans. For example, many district development committees have banned the use of heavy equipment to construct roads in mountainous regions for environmental reasons.

A number of tools and approaches are regularly used in policy-making and programme development to support the green growth agenda. These include vulnerability analysis, initial environmental examinations (IEEs), EIAs, GHG inventory, pollution thresholds (water, air and noise), resource mapping and distribution, and strategic environmental and social assessment.

While multiple climate and environment initiatives are underway, green growth programming has been treated in a somewhat piecemeal way. Many green growth aspects are promoted through individual government and donor programmes. These include community forestry projects, agricultural projects, small irrigation and alternative energy projects. Examples include the Community Forestry Programme, the Leasehold Forestry Programme, the Nepal Climate Change Support Programme, the Poverty Alleviation Fund, the Hariyo Ban Programme (HBP), the Multi-stakeholder Forestry Programme, Initiatives for Climate Change Adaptation, the Pilot Project for Climate Resilience, the Alternative Energy Promotion Programme (AEPC) and the High Mountain Agri-business and Livelihoods Improvement (HIMALI) project. There are also several programmes being implemented by NGOs.

Awareness levels around climate change and the environment are generally high in Nepal due to various donor and governmental programmes. An understanding of green growth more specifically is less developed. The capacity to design and deliver climate and environment objectives remains somewhat underdeveloped across line ministries and in district-level government. There continues to be a somewhat silo-like approach to sector planning, which prevents the sharing of best

practice. Developments in the forestry, agriculture and water sectors could be better promoted with improved cross-sector collaboration.

D.4.2 Macroeconomic perspectives

There is little evidence that the trade-offs between environmental considerations and growth are being explicitly considered or analysed in policy-making terms. One recent study commissioned by MOSTE assessed the sector growth challenges, trade-offs and incremental investment requirements for various key sectors (hydropower, agriculture and water) against future climate baselines (CDKN, 2014). Potential trade-offs, however, are typically dealt with at project level through the use of EIAs and IEE, being analysed where possible through a socioeconomic cost–benefit analysis.

Respondents felt that there was a broad level of alignment between environmental/climate change strategies and economic development in Nepal. The bulk of Nepal's economy is natural resource based, and alignment is particularly relevant in the forestry and hydropower sectors. The industrial economy is relatively small. Development plans, such as the NPC Three-Year Approach Paper, also consider the promotion of the green economy as an economic development strategy in itself, beyond the mainstreaming of environmental benefits.

The approach to green growth has been somewhat piecemeal. The promotion of green jobs and enterprises is included in the Policy Paper and also in the Annual Budget Plan. Green job creation opportunities are explicitly outlined in a number of strategy documents (e.g. the Forestry Strategy, the Agriculture Strategy, the HBP and Initiatives on Climate Change Adaptation). Baseline methodologies are regularly used to establish the number of households that will benefit, the value of self-employment generated, and number of enterprises created, although rarely developed further into an extended cost–benefit analysis for government programmes.

A number of studies have attempted to make an assessment of the GDP effects of certain aspects of green growth. For example, CDKN (2014) estimates the negative impacts of climate change in water related sectors alone at about 1.5%–2% of current annual GDP, rising to 2%–3% by mid-century, potentially preventing Nepal from achieving its growth and development objectives. These types of analysis tend to remain at a sector level, and have not yet been mainstreamed into higher-level development and growth policy.

The Government of Nepal introduced a climate budget coding approach with UNDP support in 2011. This estimates the budgetary flows associated with climate change and allows the government to track expenditure and identify mainstreaming opportunities. Approximately 9% of flows in 2012/13 were allocated to climate change. Six ministries accounted for more than 85% of spending (Urban Development, Agriculture, Irrigation, Finance, Science, Technology and Environment).

Private sector incentive schemes on green growth remain in early development.

D.4.3 Social and poverty perspectives

In practice, social and poverty considerations are often mainstreamed across all areas of policy and programming, including in green growth initiatives. The importance of benefit sharing and generating income for poor and vulnerable households is promoted as a concept by the Government of Nepal. For example, the latest Approach Paper to the 13th National Development Plan highlights the need to prioritise vulnerable groups in policy-making. Gender considerations are addressed in a cross-cutting way, including for green growth type activities. The promotion of

social inclusion is further supported in green growth-related areas through the use of community-level user groups (forest, agriculture, and water/irrigation).

Specific monitoring is common at the project level for climate and environment-related projects (e.g. number of green enterprises established, number of green jobs, etc.), but such data are not collated or tracked at a national level. At a project level, social and environmental indicators are captured in a Strategic Environmental and Social Assessment as well as other appraisal approaches (IEEs, EIAs, etc.).

There is some best practice emerging of the integration of green and social policy through project implementation. In some cases, shares in hydropower schemes are issued to the local community to ensure that economic benefits are shared. Likewise, schemes promoting income from protected areas may also operate a revenue-sharing model with surrounding communities.

The use of social safety nets in Nepal is relatively limited, and respondents do not consider the country as being able to adjust to green growth-driven resource and commodity price adjustments very effectively.

No specific evidence was identified as to the social benefits or costs of green growth initiatives in Nepal.

D.4.4 Climate resilience and the environment

Climate resilience is increasingly mainstreamed in both national and sector plans. This is supported through the NPC Climate Resilient Planning approach and implementation of the UNDP-supported Climate Budget Code, as well as through other policy mechanisms. The NAPA also acts as a guidance note for sector development planning.

Even where climate resilience objectives are not addressed explicitly, the activities of a given policy or programme may be well aligned with adaptation objectives. For example, a recent study by MOSTE undertook resilience screening of policies for the water, agriculture and power sectors. This indicated that the implicit resilience benefits of the activities were much greater than the explicit objectives. This is changing as the policy and programme framework is updated over time, with more recent policies likely to explicitly encourage resilience.

Figure 1: Screening of climate resilience of Nepal national policies and programmes (2014)

Sector	Policy	Explicit climate change objectives	Implicit climate resilience benefits
National Development	National Three Year Plan (2010–2013)		
Water cross-cutting	National Water Strategy (2002)		
	National Water Plan (2005)		
Agriculture and irrigation	Draft Agriculture Development Strategy (2012)		
	Climate Change Adaptation: Priority Framework for Action (2011)		
	National Agricultural Policy (2004)		
	Irrigation Policy (2003)		
Hydropower	Rural Energy Policy (2006)		
	Hydropower Development Policy (2001)		
Water disasters	Water Induced Disaster Management Policy (2006)		
	National Strategy for Disaster Risk Management in Nepal (2008)		

Explicit climate resilience objectives

- Does not explicitly recognise climate risks in policy development
- Explicitly recognises current climate risks to policy development
- Explicitly recognises future climate change with policy response

Implicit climate resilience benefits

- Activities deliver minimal or no climate resilience benefits
- Activities likely to build resilience to current climate risks
- Activities provide resilience for increased risk scenarios in future

Source: CDKN (2014). Economic Impact Assessment of Climate Change in Key Sectors of Nepal

The co-benefits of resilience and mitigation are also promoted where possible. Many of the sector priorities in Nepal (e.g. hydropower, forestry and land management, agriculture, etc.), offer good opportunities to do achieve both.

In terms of screening, EIAs are often used and participatory research approaches are often used for community-level resilience planning during project preparation. EIAs tend to be used where there are particular issues associated with waste or pollution. Ecosystem analysis tends to be less common. There remains limited use of climate risk-based economic analysis in decision-making at both a macro level and for the planning of individual projects. IEEs and EIAs are used to quantify and describe potential impacts, but these are rarely put in financial terms.

The evidence base is limited but expanding. Sector research on the costs and benefits of climate resilience is being conducted on an ad-hoc basis for sectors including hydropower, agriculture and water (CDKN, 2014). Indicators to measure environmental sustainability are also being expanded, for example through the Environmentally Friendly Local Governance initiative. Sectoral programmes also have monitoring indicators to measure environmental sustainability. For example, the Forest Resource Assessment is currently being implemented at a national level to identify a baseline and to ensure that the sustainable levels for harvesting of forest products can be set. Likewise, hydropower systems are monitored to ensure that base flow rates are maintained. There is also periodic land use change analysis. However, monitoring and impact assessment remains in its infancy.

D.4.5 Research opportunities

Overall, respondents felt the evidence base and supporting impact analysis for policy and programme design were not currently satisfactory. There were some specific aspects of green growth that might make it more difficult to analyse, such as the long time horizons, the uncertainty associated with both environmental and economic modelling, and the difficult of establishing micro–macro-level linkages. Issues requiring further analysis included defining green growth as a concept and using micro- and community-level data to inform policy-making.

In terms of institutions, respondents identified various institutions and organisations carrying out green growth-related research and interventions in Nepal. These include:

- *Green growth:* Nepal Agriculture Research Council, Nepal Academy of Science and Technology, resource-based user groups (e.g. Federation of Community Forest Users Nepal and Association of Collaborative Forest Users of Nepal);
- *Growth and economic development:* Centre for Economic Development and Administration (CEDA), Green Foundation Nepal, Martin Chautari;
- *Climate change mitigation:* ICIMOD, World Wildlife Fund (WWF), SAARC Forestry Secretariat, Local Initiatives for Biodiversity, Research, and Development (LIBIRD), AEPC;
- *Climate change resilience:* ICIMOD, WWF, IUCN;
- *Economics of climate change:* ICIMOD, IUCN, CEDA, NAST, NARC, WWF, CARE Nepal.

Both ICIMOD and IUCN were cited as potential regional platforms for the development of research.

D.5 Pakistan

D.5.1 Policies and programmes

Elements of green growth have been widely adopted as policy concepts in Pakistan. Core concepts include encouraging sustainable development, the equitable sharing of environmental benefits, increased community management of natural resources, greater climate resilience, sustainable infrastructure and integration of environmental issues into socioeconomic planning.

Pakistan has a relatively structured institutional approach to mainstreaming green policy. A three-level institutional framework is used at the federal, provincial and local levels. The National Sustainable Development Council manages policy at a national level, while Provincial and Local Sustainable Development Councils manage implementation at the local level. National climate change strategy is placed alongside overall development goals, which are together translated into specific sector objectives. Line ministries are then responsible for sector programming to deliver on these objectives.

The concept of green growth has to some extent been mainstreamed into the 10th Five-Year Plan.

- The 10th Five-Year Plan also references a number of elements of green growth. The Plan references sustainable development, the integration of climate change into development planning, support for natural resources, sustainable forestry and biodiversity conservation, sustainable land management and capacity building. There is an environment and climate change section that sets out the range of incentives, tax breaks and fiscal support mechanisms to be approved through the provincial sustainable development councils. There is also promotion of eco-tourism and associated natural resource conservation.

In 2007, a few months before the end of its tenure, the outgoing government launched the 'Vision 2030' document.[28] The new government in March 2008 shelved it and developed the 'New Growth Strategy' in 2011. However, soon after the present government took over in May 2014, this document was shelved.

The government has just announced the 'Vision 2025' document. It is based on seven pillars: I – Developing human and social capital; II – Achieving sustained indigenous and inclusive growth; III – Democratic governance, institutional reform, and modernisation of the public sector; IV – Energy, water, and food security; V – Private sector and entrepreneurship-led growth; VI – Developing a competitive knowledge economy through value addition; and VII – Modernising transportation infrastructure and greater regional connectivity. Also, five key enablers are included: I – Shared vision; II – Political stability and continuity of policies; III – Peace and security; IV – Rule of law; and V – Social Justice.

This growth plan is supported by the NSDS (2012) – although this is still in draft form and may require thorough revision before being published by the former Ministry of Climate Change – and the NCCP (2012) developed by the Ministry of Environment. Also, a Framework for Implementation of Climate Change Policy (2014–2030) has been announced.

- The draft NSDS seeks to set out an integrated growth model that addresses economic development, social development and environmental sustainability. Pakistan's economic growth model is presented, and a series of challenges identified. Green growth approaches to agriculture, energy, industry, trade, water sector, waste management and tourism are set out. A strategy for social inclusion is also described, together with a broad implementation and monitoring mechanism.

- The NCCP aims to support the delivery of the development goals set out in the Planning Commission's Vision 2030 document. It identifies vulnerabilities across a range of sectors, including water resources, agriculture, forests, coastal areas, biodiversity and ecosystems. Various adaptation measures are identified, including disaster preparedness, capacity building, institutional strengthening, technology transfer and international cooperation. The energy section sets out plans for a carbon tax, a switch to low carbon fuels and carbon capture. Green construction, mitigation, capacity building and institutional strengthening are also discussed.

A number of sector policies also promote green growth objectives. For example, the draft National Forest Policy (2010) recognises the potential for reforestation as a carbon sequestration strategy. It also promotes watershed protection, forest livelihoods and soil erosion reduction. Alternative fuel sources are also considered, as is REDD+ as a forest livelihoods strategy. However, this policy has not been accepted, and the federal cabinet gave the direction that the provinces should develop their own forest polices. The Renewable Energy Technologies Act (2010) sets up the institutional framework for the promotion of solar photovoltaic, thermal, hydrogen, biogas, hydro and wind technologies, and the Alternative Renewable Energy Policy (2011) aims to harmonise the related efforts of various government bodies and increase renewable energy deployment, among other objectives. These aspirations are further reflected in the annual development plans and

[28] The Vision 2030 document from 2007 contains a number of green growth-related references. The main focus is on adaptation, but mitigation measures (including in energy efficiency, transport, forestry, industry, agriculture, livestock and town planning) are also included. The sustainable development section sets out government plans for strict enforcement of environmental and pollution standards and a ban on persistent organic pollutants. Incentives for water saving technologies in agriculture are identified. There are plans for the conversion of heavy transport vehicles to euro emissions standards and introduction of CNG-based and mass rapid transport systems. There is a commitment to double forest cover to 6% by 2030 through better watershed management and planting campaigns. Alternative energy sources are also promoted.

poverty reduction papers. Stakeholders indicate that the Government of Pakistan is also considering the establishment of a National Climate Change Fund.

On disaster risk reduction, the government has developed a National Disaster Management Plan 2012–2022 (2012) and a National Disaster Risk Reduction Policy (2013).

At a local level, provincial governments are also developing green growth policies. For example, the Khyber Pakhtunkhw government is implementing a Green Growth Initiative to support socioeconomic development through the efficient and sustainable use of natural resources, and through the identification of green policies for energy, water, forestry, transport and agriculture.

In practice, stakeholders feel that green growth policies have not yet translated into effective programmes and projects. The focus has been more on sensitisation of policy-makers and the public. Stakeholders report a number of barriers to green growth policy-making in Pakistan. Some of these are generic to all socioeconomic development, including political instability, a lack of security, and inadequate power and other critical infrastructure. Governance issues are widespread in both the public and private sectors. Pakistan lacks the institutional and technological capacity to fully embrace green growth, particularly in terms of the implementation of policies and programmes. Awareness levels remain relatively low.

Stakeholders consider that the institutional capacity to deal with green growth is generally inadequate, with strategies and responsibilities too fragmented. A lack of political will to make fundamental changes to the planning and economic development system are also identified by stakeholders as a key barrier. For example, the Ministry of Climate Change was downgraded to the status of a department in 2012 when the new government came to power, leading some to question the level of commitment among policy-makers.

D.5.2 Macroeconomic perspectives

Historically, growth policy in Pakistan (e.g. the Structural Adjustment Programme) has tended to ignore environmental issues, leading to widespread environmental degradation. Stakeholders report that traditional growth strategies continue to persist in the country, despite the emerging green growth policy frameworks set out above.

Respondents on the whole were overwhelmingly positive about the co-benefits implicit within the green growth concept, and there was little evidence of concern over the potential trade-offs. The emerging policy framework is beginning to align green growth and development objectives.

A number of studies have reviewed the cost of long-term environmental degradation and climate change in Pakistan. The World Bank gives a figure of PKR 365 billion as the current annual cost of environmental degradation.

From a budgeting and financial planning perspective, climate change is not yet included as a key element in tracking or allocation. The UNDP is supporting the Government of Pakistan to introduce a climate budget code to assist with the identification of climate-related budget flows. The national budget has been reformed to ensure that line ministries define their objectives and outputs associated with their expenditure. This provides the basis for including climate change as an objective.

In terms of the provision of financial support and incentives to non-state actors (private sector, NGOs, etc.), national-level funds are allocated through the medium term development goals. Most funds are mobilised through development partners as the government lacks significant funds for private sector mobilisation. For example, the Global Environment Facility operates a small grants

programme to support community NGOs. International climate finance mechanisms also provide some level of funding opportunity (e.g. the Clean Development Mechanism).

D.5.3 Social and poverty perspectives

There was little evidence as to the integration of green growth and social protection initiatives in Pakistan. A small number of stakeholders identified the benefits of green growth for vulnerable groups (e.g. increased livelihood opportunities and reduced inequality). Some social safety net programmes, such as the Benazir Income Support Programme, have provided support to those affected by climate change, such as by floods.

The study revealed little evidence of the potential distribution of the benefits and costs of green growth. There is no mechanism in Pakistan to measure how sustainable development of green growth impacts upon marginalised groups. There are no targets or plans to address social development through green growth policy. There was no evidence of how marginal groups might be protected from changes in commodity or resource prices affected by green growth policy.

D.5.4 Climate resilience and the environment

Climate resilience policy is set out the 10th Five-Year Plan, the 2030 document and the Climate Change Task Force report. The climate resilience monitoring mechanism is explained in the NCCP. Resilience planning is actioned through the national and provincial committees. For example, the Khyber Pakhtunkhw climate strategy sets out a provincial-level approach to resilience planning.

However, climate resilience planning has not translated into programme- and project-level risk screening, and there is no formal institutional mechanism. Environmental risk screening is more common through the EIA process at a project level. Environmental costs and benefits are sometimes assessed as part of larger donor-funded projects.

In general, policy-makers use the IPCC climate projections when designing policy and programmes. There are a number of research reports that set out key sector-level impacts.

Climate change adaptation and mitigation plans are separate in the climate change policy. The majority of programmes focus on adaptation, reflecting the relatively low level of emissions intensity in Pakistan.

D.5.5 Research opportunities

The integration of green growth into the overall economic framework is weak. It would take some time to change this and address the relevant concepts.

In terms of research institutions, the Pakistan Institution of Development Economics is involved in R&D of green growth concepts, together with the Sustainable Development Policy Institute. The Planning Commission also conducts some research, together with a range of universities, NGOs and CSOs.

Annex E Main green growth-related policies in each country

	Green growth, climate change, and disaster risk management policies	National growth strategies and economic development plans	Sector strategies					
			Agriculture, livestock, and fisheries	Forestry, mining, and land use	Environment and biodiversity	Water and waste management	Urban development and infrastructure	Energy, industry, and transport
AFGHANISTAN	Afghanistan Initial National Communication To the UNFCCC (2013)	ANDS 2008–2013 (2008)	Afghanistan Agriculture Master Plan (2008)	Mines Law (2014)	Environment Law, 2007			
	Strategic National Action Plan for Disaster Risk Reduction (2010)			Forest Law (2008)	Clean Air Regulation (2007)			
					EIA Regulation (2007)			
					National Environmental Action Plan (2007)			
					EIA Policy (2007)			
					Regulation on Ozone Depleting Substances (2007)			
					Regulations in waste management *			
					Regulations on noise control *			
					Hydrocarbon Law (2007)			
					UNEP State of Environment, 2008			
BANGLADESH	National Adaptation Plan of Action (2005, updated 2009)	6th Five-Year Plan 2011–2015 (2011)	Balu Mohal and Soil Management Rules (2011)	National Land Use Policy (2002)	National Environment Management Action Plan (NEMAP) (1995)	Draft National Solid Waste Management Rules (2010)		Industrial policy (2005)
	Bangladesh Climate Change Trust Fund Act (2010)	Perspective Plan 2010–2021 (2010)	National Fisheries Policy (1998)	Social Forestry Rule (2004, amended in 2010 & 2011)	Coastal Zone Policy (2005)	Hazardous Waste Management Rules (2010)		Renewable Energy Policy of Bangladesh (2008)

	Green growth, climate change, and disaster risk management policies	National growth strategies and economic development plans	Sector strategies					
			Agriculture, livestock, and fisheries	Forestry, mining, and land use	Environment and biodiversity	Water and waste management	Urban development and infrastructure	Energy, industry, and transport
	National Plan for Disaster Management 2010–2015 (2010)		Livestock Development Policy (1992)	Forest (Amendment) Act (2012)	Integrated Coastal Zone Management Plan (2005)	National 3R Strategy on Waste Management (2009)		
	BCCRF (2011)		National Seed Policies (1993)	Forest Policy (1994)	Draft National River Conservation Act (2011)	Water Policy (1999)		
	Disaster Management Act (2012)		Agriculture policy (2010)		Revised National Conservation Act (2010)			
	Bangladesh CCSAP (2009)				Bangladesh Wildlife Conservation Act (2012)			
	Bangladesh CPEIR (2012)				National Biodiversity Strategy and Action Plan for Bangladesh (2004)			
	NAPA (2005)				Bangladesh Environment Policy (1992)			
	Second National Communication of Bangladesh to UNFCCC (2012)							
India	NAPCC (2012)	12th Five-Year Plan 2012–2017 (2012)	National Mission for Sustainable Agriculture (2014)	National Forest Policy (1998)	Biological Diversity Act (2002)	National Water Mission (2011)	Energy Conservation Building Code (2007)	Energy Conservation Act (2001)
	State Action Plans for Climate Change (SAPCCs) – West Bengal: Madhya Pradesh: Jharkhand				Environment Protection Act (1986)	Water Act (1974)		Electricity Act (2003)
	Second National Communication to the UNFCCC (2012)				Air Act (1981)			Integrated Energy Policy (2006)
								National Electricity Plan (2012)

	Green growth, climate change, and disaster risk management policies	National growth strategies and economic development plans	Sector strategies					
			Agriculture, livestock, and fisheries	Forestry, mining, and land use	Environment and biodiversity	Water and waste management	Urban development and infrastructure	Energy, industry, and transport
								National Policy on Biofuels (2009)
								National Solar Mission (2010)
Nepal	Climate change policy (2011)	Approach Paper to the 13th Plan 2013/14–2015/16 (2013)	Agriculture Development Strategy (2013)	Forestry Sector Policy (2000)	National Parks and Wildlife Conservation Act (1973)	Water Resources Act (1992)		District Climate and Energy Plan (2013)
	Nepal Low Carbon Economic Development Strategy (2013)	Sustainable Development Agenda for Nepal (SDAN) (2003)		Forest Act (1993)	Soil and Watershed Conservation Act (1982)			Subsidy Policy for Renewable Rural Energy (2009)
	NAPAs (2010)			District Forest Strategic Plan	Environment Protection Act (1996)			
	The Strategic Programme for Climate Resilience (2012)				Environment friendly local governance policy (2010)			
	National Strategy for Disaster Risk Management (2009)							
Pakistan	NCCP (2012)	NSDS (2012)		National Forest Policy (2010)	National Environment Policy (2005)	National Drinking Water Policy (2009)	National Resettlement Policy (2014)	National Transport Policy (1991)
	Initial National Communication to the UNFCCC (2003)	Vision 2030 (2005)			Environment Protection Act (1997)			National Energy Policy (2013)
		Mid-Term Development Framework 2010–2015 (National Five-Year Plan) (2010)			National Conservation Strategy (1992)			
					National Environmental Action Plan (2001)			