Roadmap for a green economy in the Heart of Borneo: a scoping study

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The momentum for building a global green economy is growing. Spurred on by the need to curb greenhouse gas emissions, to use resources more efficiently, to provide long-term sustainable increases in GDP and standards of living, and to value the often invisible natural assets that have underpinned economic success over the centuries. These needs go hand in hand with opportunities – for green jobs, for new products and innovations, for cost reduction, and for capturing some of the estimated **USD 5 trillion low carbon and environmental goods and services market worldwide**.

The last few years have seen a proliferation of green economy initiatives, both public and private, at the national and international level. This will continue, with green growth set to feature prominently at Rio+20. The green economy is about **improving prosperity in an environmentally friendly and socially inclusive way**, although the emphasis of individual green economy initiatives varies. Our analysis of these initiatives highlights the importance of critical success factors which need to be present to build a green economy; **policy, skills and knowledge, analysis and evidence, and collaboration**. **Finance** is also critical; the transition to a green economy will be costly, although some policies and practices (e.g. resource efficiency) can save money.

National responses to the green economy opportunity vary. In developed countries this has been a way of responding to the 2008-09 recession and is an issue of consumption not just production. In developing countries the focus has been more on the supply side. For some countries green growth is primarily about the natural environment, whilst for others it is largely an issue of urbanisation. And within countries, green economy strategies differ between rural and urban areas. Whatever the primary focus, few, if any, countries can afford to ignore the green economy opportunity.

The green economy opportunity in the Heart of Borneo

The Heart of Borneo (hereafter the HoB) is rich in natural capital with over 22 million hectares of intact tropical forest. It is also an existing government priority for Indonesia, Malaysia and Brunei, with strong foundations in terms of national action plans, governance bodies and emerging partnerships. In 2007 the three Bornean Governments signed the HoB Declaration (hereafter the Declaration), committing to conserve and sustainably manage the biodiversity, ecosystems and natural resources in HoB. Domestic political commitments have since been boosted by international support for action to tackle climate change and protect biodiversity in HoB. Some businesses are also showing a strong interest in opportunities to green economic activity.

A green economy in the HoB could help deliver the objectives set out in the Declaration but also support goals such as economic growth, poverty alleviation and energy and food security. Green economic activity, such as renewable energy generation, bio-prospecting, eco-tourism, forest carbon and ecosystem service markets and sustainable agriculture and forestry could also attract foreign investment from both the public and private sector and improve the quality of the environment and the well-being and the prosperity of local inhabitants.

Progress is already underway in developing a greener economy in the region, with changes to both policies and practices. These range from payments for ecosystem services in Kalimantan, incentives for investment in renewable energy (i.e., Feed-In Tariffs (FITs)) in Malaysia and public-private conservation programs in Brunei. On a more systemic level both Central and East Kalimantan have published low carbon growth and prosperity plans, Sabah has recently committed to a state wide REDD+ plan, and Brunei is working with Carbon Conservation towards a green economy. Indonesia is a priority for the UNEP Green Economy Initiative.

However, efforts to fully deliver the Declaration and green economic growth will need direction, coordination and large scale implementation support to address capacity constraints, economic growth based on unsustainable natural resource use, the high costs of investing in economic transformation and continuing demand for unsustainable goods and services (mostly for export). Changes to policies and practices are imperative, but **need to be based on sound evidence generated through robust modelling, stakeholder engagement and demonstration projects**.

Towards a Roadmap

Recognising the green economy opportunity in HoB, WWF and PwC have worked together to analyse the current situation in HoB and the global response to green growth and to make a series of recommendations for how HoB governments can seize on these opportunities. Both WWF and PwC hope that this document provides a useful input for the three governments and stand ready to further support the elaboration and implementation of the recommendations. We believe an integrated approach to green growth is essential to understand the trade-offs and synergies between policies and practices and to help avoid unintended consequences. We recommend the following:

Develop a 'Green Growth Generator' and Roadmap: an evidence-based decision-making framework for green growth that is created in partnership with the HoB governments and other stakeholders. This will require consolidation of the existing, and the gathering of new, data to create baselines, followed by the development of economic models to generate scenarios for different economic futures. The output of the generator would be a Roadmap with recommendations for changes to policies and practices, including how to support the Strategic Plans of Action. The estimated cost is USD 900,000.

Create a virtual HoB Green Economy Centre of Excellence (CoE): a capacity building programme for skills and knowledge to advance trilateral commitments. HoB governments, businesses and other stakeholders would benefit from the CoE through training programmes and knowledge transfer in a variety of subjects including REDD+, adaptation, renewables, bioprospecting and sustainable agriculture and for a variety of skills (e.g. policy development and enforcement, MRV, TEEB/INVEST, GIS and green business leadership). The CoE would be permanently staffed, supporting demand-led country and province specific initiatives. The best available trainers and technology would be procured to build capacity. Estimated funding for 3 years: USD 3,375,000.

Set up a HoB Partnership Forum: a platform for coordinated stakeholder engagement to incubate ideas and stimulate and facilitate public private collaboration. Membership would include governments, businesses (including the Green Business Network), donors and NGOs. The aim of the forum would be to generate broader and deeper stakeholder engagement and commitment for the HoB to inform policy-making, business practice and investment. Estimated funding for 3 years is USD 250,000.

Design and set up a Sustainable Finance Facility for Green Growth: recent international commitments as well as increasing interest from businesses in green economic opportunities, present unprecedented potential revenue sources. Donors expect transparency and use of funds in an efficient, effective and equitable manner. This could be achieved by setting up a sustainable finance facility with an initial injection of public finance to leverage private investment**.** The facility would be independently managed with decisions made on a technical basis by a representative board of the HoB governments, international organisations, donors and subject matter experts. The facility would act as pilot for an investment fund. Estimated funding for set up and a range of projects is USD 35,000,000 for 3 years.

Identify a set of demonstration projects: Green Growth is about finding ways to create real change on the ground to improve people's lives and the environment. There has been a lot of progress in HoB which the recommendations above can help to build upon. All the recommendations should be informed by projects on the ground and demonstrate their potential to create change through piloting, scaling up and rolling out green growth solutions. Examples could include; using the Green Growth Generator to identify the economic case for rolling out sustainable forest management to all concessions in HoB; using the Sustainable Finance Facility to scale up restoration efforts or piloting land swaps to save millions of hectares of forest land without inhibiting the growth of the palm oil sector.

Next Steps

In 2011 WWF, PwC and partners will convene public and private sector stakeholders to discuss how these recommendations could help advance HoB and wider green economy goals. In addition there are a series of high profile events such as the East Asian World Economic Forum, ASEAN summit and the Business 4 Environment Summit, at which stakeholder discussion can take place. Funding sources need to be identified and the recommendations developed in accordance with **investor and donor ambitions**.

Background to this document

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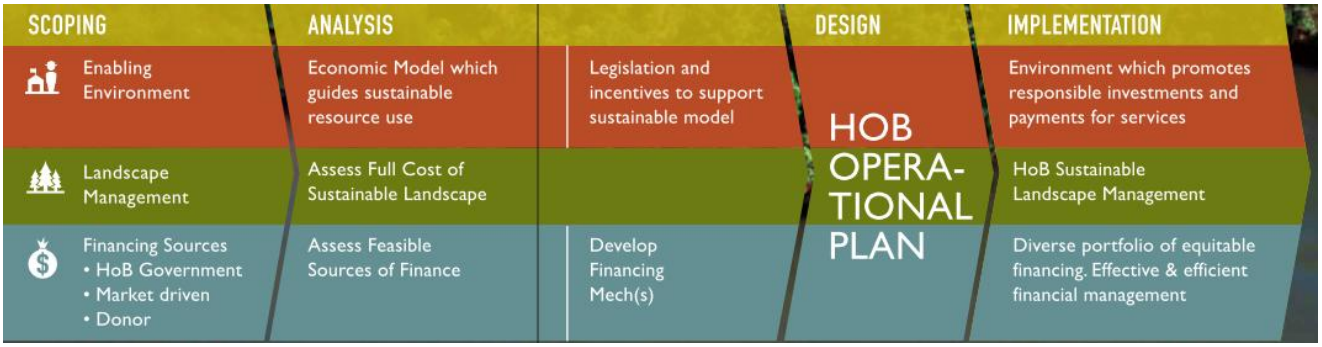
WWF is a long standing partner of the three HoB governments in supporting the development and implementation of the HoB Initiative. For example WWF began work on the island of Borneo in the 1960s. It has a long history of supporting species and habitat conservation programs in partnership with governments and other stakeholders. WWF supported the three governments to agree to the Heart of Borneo Declaration and since has actively been involved in developing regional and national strategic plans and implementation structures. More recently some of the many examples include: WWF's support to the government of Brunei and partners on the ground-breaking scientific research on biodiversity of a remote forest reserve. In Indonesia, WWF is working with multiple government agencies to develop the first-ever environmentally friendly-based National Strategic Area designation for HoB. And in Malaysia, WWF and the government of Sabah have partnered to develop an innovative, state-wide REDD+ programme.

Recently WWF worked with the three HoB governments to release "A partnership approach to economic sustainability: Financing the Heart of Borneo". This recognised that HoB plans need to be aligned with development plans in the three countries and that this requires the development of an economic model to guide sustainable resource use. At the launch of this report at the United Nations Conference on Biological Diversity (CBD) Conference of the Parties (COP), the international professional services firm PwC offered their support to WWF to follow up on the opportunities laid out by the three governments.

Fig 1. Diagram taken from the Sustainable Finance report:



Further discussion with PwC highlighted that the 'green economy'[1] was a strongly emerging concept which has real opportunities to contribute positively to the social, environmental and economic agendas in the region. Recognising the green economy opportunity for the HoB, WWF and PwC worked together to analyse the current situation across the HoB and the global response to the green economy and to make a series of recommendations for how HoB governments could seize on these opportunities to drive forward the Declaration. These are set out in this scoping study which PwC has drafted, working closely with WWF Indonesia, for WWF. The scoping study was produced over a 3 month period (November 2010 to January 2011), based on desk research and stakeholder engagement (in HoB countries and more widely). The scoping study is not a comprehensive investigation into all aspects of the green economy opportunity in HoB but an attempt to set out the main issues and establish a way forward for further investigation and action.

This report has 5 sections. **Section 1** reviews current progress in green economy initiatives globally: **Section 2** relates these to the Declaration and wider government goals. The available natural, human and physical capital and their current uses are considered, highlighting synergies and conflicts with the green economy opportunity. **Section 3** builds on this to define an approach to progress green growth and concludes with a set of recommendations that are intended to address each of the critical success factors for green growth. **Section 4** considers how progress and success towards a green economy should be measured and tracked through the different stages of consultation, analysis and implementation. **Section 5** draws the different elements of the

[1] Green economy, green growth and green economic growth are used interchangeably in this report, depending on syntax.

approach together, integrating them to briefly illustrate how they interrelate to each other. Sources of information used during the scoping study and a glossary of key terms are included in the **Appendices.**

Both WWF and PWC hope that this document provides a useful input for the three governments and stand ready to further support the elaboration and implementation of the recommendations. We intend to discuss our ideas and recommendations with the three governments and a range of other potential stakeholders e.g. donors, business and implementation partners to continue to refine our thinking and to generate support for work towards a green economy in HoB based on learning from this report

About WWF

WWF is a global organisation acting locally through a network of over 90 offices in over 40 countries around the world. WWF has more than 5 million members worldwide. WWF was founded in 1961 and some of its initial work began in Indonesia and Malaysia. Currently WWF has over 80 staff working on the ground in Borneo. These teams are backed up by policy, strategy, business and communication staff in Jakarta, Kuala Lumpur and WWF's global network. WWF has a successful history of collaborating with government, businesses and communities in Borneo to facilitate and support conservation and sustainable development for people and nature. WWF has been a long term supporter of the Heart of Borneo initiative, working with the three governments to secure the Declaration and playing a partnering role within the three countries to support its implementation. Examples of our work include supporting over 1 million hectares of forest towards FSC certification in Borneo, facilitating creation and management of over 3M hectares of protected areas in HoB and current work to support mapping and valuation of ecosystem services in HoB.

About PwC

PwC is a professional services firm founded on a culture of partnership with a strong commercial focus. The Sustainability & Climate Change (S&CC) group within PwC brings together environmental specialists, engineers, financial specialists and economists. With a Centre of Excellence in the UK but with a global network across PwC members firms (including Indonesia and Malaysia), the team comprises some 800 sustainability and climate change professionals. The ability to work closely with other lines of service across PwC networks and with clients and partners in the public and private sector, based on over 20 years' experience , gives PwC the ability to provide holistic solutions to pressing economic and environmental problems. Competencies include sustainable sourcing and procurement, climate change and carbon markets, policy and economics, international development, agriculture, biodiversity and ecosystems, adaptation, and measuring, managing, reporting and assuring. PwC has been working in the Borneo region with a range of clients for many years as well as more recently performing a review of the sustainability of business practices in Borneo, supporting WWF's "Business Solutions in the Heart of Borneo" report.

Section 1: The case for a green economy

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Introduction

Economic growth depends on our ability to use natural and social capital, in order to create new physical and financial capital.[2] Progress in transforming our economic and social life over the past few centuries has been remarkable. However, there is a growing concern that if we run the natural capital asset base down too far then we risk undermining our ability to maintain existing and develop new physical and financial capital.

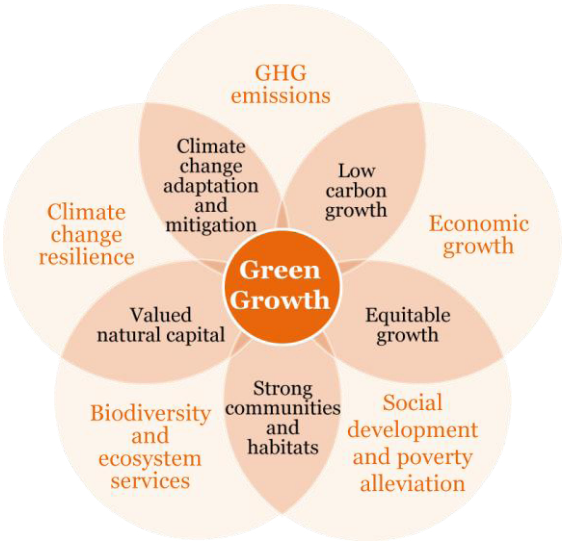
The limits to this transformation are not clear. Estimates exist for present and future water availability, for the ability of the Earth to absorb greenhouse gases and for our ability to substitute scarce resources with renewable ones. Much less clear is the extent to which we can afford to run down the Earth's biodiversity and ecosystem services, such as flood protection and the provision of food, without costly or irreversible feedbacks. Despite these uncertainties we know that in order to grow the world economy and support the changing consumption patterns of a global population predicted to reach 9 billion by 2050, we need to use natural capital much more efficiently; to decouple economic growth from biodiversity and ecosystem degradation and depletion.

The opportunities presented by the challenge of decoupling economic growth and environmental degradation are remarkably varied and extensive. Opportunities include the development of technologies for more efficient use of natural capital (e.g. water, soil and fossil fuels), the recycling of materials, the development of cleaner (less polluting) goods and services, the use of natural capital for recreation, harnessing the power of the sun, water, wind and geothermal activity for energy production, the design of products derived from biodiversity and the trading of pollution permits. These opportunities and numerous others are part of the growing global green economy. **Definitions of the green economy vary, but at its heart, a green economy will identify and value natural capital in order to transform and strengthen economic activity, benefitting society today and in the future. This will necessarily involve decoupling economic growth from biodiversity and ecosystem degradation and depletion.**

We recommend defining the green economy along the five dimensions depicted in figure 1.1. Interactions between the dimensions illustrate the kinds of changes that could be expected to arise from the implementations of interventions (policies and practices) designed to address each of the five dimensions. For example, the combination of economic growth and greenhouse gas emission reduction leads to low carbon growth, and the further consideration of social development and poverty alleviation will steer this path towards equitable growth. Together the five dimensions set out the core issues to address when transitioning to a green economy.

[2] Natural capital assets include renewable and fossil fuels, water, minerals and biodiversity, social capital includes skilled workers, community cohesion and institutions, physical capital includes buildings, roads, dams and machinery, and financial capital is primarily money but can take different forms e.g. loans, shares, debentures, over-drafts.

Figure 1.1. The Five Dimensions of green growth



- Economic growth is important for social development and prosperity and must be considered in conjunction with other environmental and social factors, and business activities.
- Social development and poverty alleviation is a central objective of green growth, and is highly correlated with economic growth and environmental quality.
- Biodiversity and ecosystem services provide valuable contributions to economic growth and human welfare but are often omitted from decision making. Green growth seeks to address these market failures.
- Climate change resilience is about adapting to the physical impacts of a changing climate.
- Greenhouse gas emissions need to be limited to contribute to global and national efforts to mitigate climate change and minimise future adverse impacts on local and international society.

Source PwC and WWF

Drivers of the Green Economy

Interest in the green economy has been growing worldwide. Whilst many of the ideas that underpin the green economy are not new, such as sustainable development, payments for ecosystem services and technology transfer, the green economy opportunity at the start of the twenty-first century represents an evolution from similar previous initiatives for a number of reasons, including the:

1. Use of green stimulus packages to respond to the recession of 2008-09;
2. Scale of international commitments to tackle climate and biodiversity challenges;
3. Growing understanding and use of environmental economics to value natural capital;
4. Demand for low carbon and environmental goods and services (currently approximately USD 5 trillion, projected to grow 4% by 2015); and
5. Proliferation of green economy initiatives focusing on analysis and evidence, collaboration, policy and skills and knowledge.

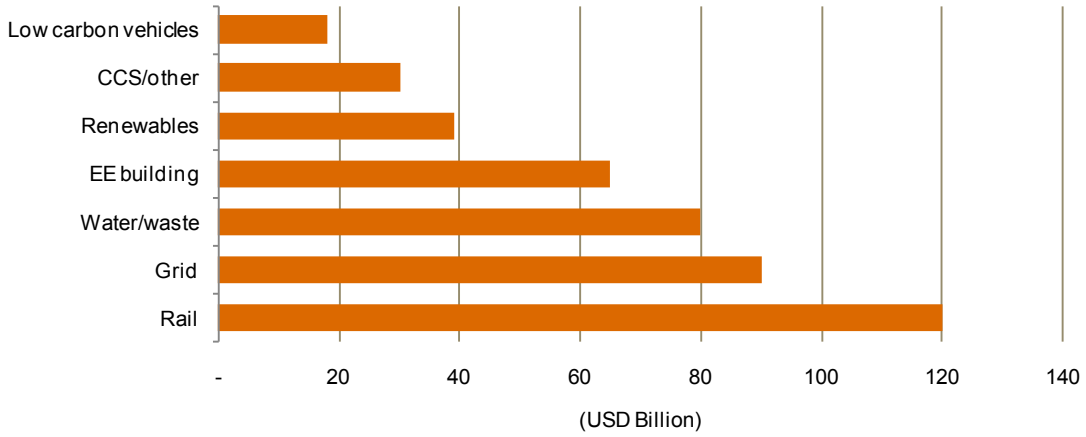
These five characteristics of recent green growth are driving change and opportunity at an unprecedented level. Understanding these drivers is essential to understanding the scale of the opportunity that green growth presents; consideration of them is therefore set out in more detail below.

1. Green stimulus packages

In 2008-2009 when major economies in all corners of the globe fell into the worst recession since the 1920s many governments focused on green stimulus packages as a vehicle for job creation, export strength and economic recovery, in other words 'green growth'. In total 15.6% (USD 436 billion) of fiscal stimulus commitments were assigned to green economic activity.[3] Stimulus packages covered a range of green economy sectors, including obvious ones such as renewable energy but also less obvious sectors such as rail, which is considered a greener alternative to air and road travel and constitutes the largest spend of any one sector (see figure 1.2).

[3] http://globaldashboard.org/wp-content/uploads/2009/HSBC_Green_New_Deal.pdf

Figure 1.2 G20 Green stimulus spending per sector



Source: HSBC global research, UNEP

Of all the countries that launched green stimulus plans between 2008 and 2009, South Korea led the way with 80.5% of its total fiscal stimulus (USD 30.7 billion) assigned to its green growth strategy. The 'Green New Deal' will entail a fundamental restructuring of the South Korean economy, including of the energy industry which is heavily reliant on imported oil and natural gas. It has also separately planned to invest USD 84 billion to increase energy efficiency[4]. Table 1.1 summarises some of the green stimulus packages published by governments to date in response to the 2008-09 recession.

Table 1.1: Summary of green stimulus packages

	Total Green stimulus (bn USD)	Green stimulus as % of total stimulus	Green stimulus as % of GDP (2008)	Areas of expenditure							
				Renewables	Energy efficiency in buildings	Low carbon vehicle	Rail	Grid	CCS[5]	Water/waste	Land-use
China	200.8	34.4	4.8	✓	✓	✓	✓	✓		✓	
US	112.2	11.5	0.8	✓	✓	✓	✓	✓	✓	✓	✓
South Korea	30.7	80.5	3.2	✓	✓	✓	✓			✓	
EU	22.8	58.7	0.1	✓	✓	✓		✓	✓		
Germany	13.8	13.2	0.4		✓	✓	✓				
Japan	12.4	2.6	0.3		✓			✓			
France	7.1	21.2	0.2	✓	✓	✓	✓	✓			✓
Canada	2.6	8.3	0.2	✓			✓	✓	✓	✓	
Australia	2.5	9.3	0.2		✓						
UK	2.1	6.9	0.1		✓	✓	✓	✓		✓	

Source: Stern, 2008, and http://greeneconomypost.com/country-greenest-stimulus-package-674.htm

[4] Bloomberg, July 2009

[5] Carbon Capture & Storage

2. The scale of international commitments to tackle climate and biodiversity challenges

In recognition of the need for adequate and sustainable access to funding by developing countries, the 2009 UNFCCC Conference of the Parties (COP) 15 in Copenhagen resulted in an 'Accord' which agreed an ambition to raise USD 100 billion per year in climate aid by 2020.This ambition was kicked off with 'Fast Start' financing of approximately USD 30 billion for the 2010-2012 period, for enhanced action on mitigation (including Reducing Emissions from Deforestation and Forest Degradation, aka REDD+), adaptation, technology development and transfer, and capacity building. The 2010 Cancun climate conference confirmed these commitments and agreed to establish a centralised 'Green Climate Fund' to help disburse money needed to help developing nations combat climate change. The fund is expected to be approximately half public and half private sector funded, with appropriate carbon pricing emerging as an important new source of finance. The fund will be governed by a board with equal representation from developed and developing countries with the World Bank serving as the interim trustee for the first three years.

The Cancun summit also produced an agreement to establish a technology mechanism to set up networks that will help facilitate the preparation of projects and innovation instead of direct technology transfer. A Technology Executive Committee will oversee the Climate Technology Centre and Network that will manage regional hubs of technology development.

Cancun also recognised that 'enhanced action and international co-operation' on adaptation is urgently needed, resulting in the establishment of the Cancun Adaptation Framework to increase financial, technical and constitutional support in relation to adaptation in developing countries. This framework includes the creation of an Adaptation Committee to support implementation of actions and provide technical support through knowledge sharing, partnerships and guidance on how to spend climate finance.

In the run up to Cancun one of the areas which received the most attention, and perhaps also held the greatest expectations, was REDD+. During the summit many of the potentially contentious issues where clarified, including agreements for the allowance of 'interim' sub-national REDD+ projects until sufficient capacity is developed for national monitoring and reporting systems. Requirements for indigenous rights and biodiversity protection were reiterated, however, the monitoring, reporting and verification (MRV) of this remains to be developed. Also outstanding are decisions over the appropriate REDD+ funding mechanism. Fund-based and market-based approaches have been debated, along with various combination options; resolution is expected at COP17, to be held in Durban, December 2011. If the decision is taken to partially or fully incorporate REDD+ into compliance carbon markets it will significantly increase the resultant level of demand and therefore the potential scale at which REDD+ can reduce deforestation and influence land use decisions.

In the meantime, governments, NGO's and some private investors are moving ahead with REDD+ demonstration projects funded via bilateral agreements, multilateral fast start funds, the voluntary carbon markets and private initiatives. Fast start funds since Copenhagen have spurred the proliferation of REDD+ projects, together with other climate change mitigation and adaptation projects, including: land use, renewable energy, energy efficiency, adaptation and infrastructure, technology and capacity building, and biodiversity (table 1.2).

Table 1.2: Fast-start pledges and programmes

	Total pledged	Total disbursed	Prog-rammes	Main Themes						
				Land use/REDD	Renwables	Energy efficiency / Low Carbon	Water	Adaptation	Technology and capacity	Biodiversity
Australia	USD 603 million		5	✓				✓		
Belgium	USD 197 million	USD 55 million	-	✓	✓			✓		
Canada	USD 402 million		-	✓				✓		
Denmark	USD 210 million	USD 54 million	12	✓	✓		✓	✓	✓	
European Union	USD 197 million	USD 66 million	8	✓	✓			✓		
Finland	USD 144 million		7			✓		✓	✓	
France	USD 1 651 million	USD 1 651 million	24	✓	✓		✓			
Germany	USD 1 651 million	USD 383 million	51	✓	✓			✓	✓	✓
Iceland	USD 1 million		-							
Japan	USD 15 000 million		-	✓	✓			✓		
Luxembourg	USD 12 million	USD 12 million	-	✓				✓		
Malta	USD 1.3 million	USD 0.13 million	2			✓			✓	
Netherlands	USD 406 million	USD 406 million	7							
Norway	USD 1 000 million	USD 382 million	20	✓	✓	✓				
Portugal	USD 47 million	USD 16 million	-							
Slovenia	USD 10 million		2			✓				
Spain	USD 492 million		6	✓	✓			✓		
Sweden	USD 1 049 million		17	✓			✓	✓		✓
Switzerland	USD 145 million		-							
United Kingdom	USD 2 324 million	USD 880 million	8	✓	✓			✓	✓	
United States		USD 1 700 million		✓	✓	✓				✓

Source: www.faststartfinance.org

The costs of reducing emissions are highly variable depending on the mitigation strategy employed. The costs from avoided deforestation and degradation are amongst the most attractive relative to many other large-scale mitigation options, for example concentrated solar power, coal-to-gas fuel switching, biodiesel and retro-fitting carbon capture and storage, although they are considerably higher than some abatement options, in particular energy efficiency gains. From the fast start funding pledged to date, USD4.5 billion is being directed at REDD+ and is expected to be used principally to support institutional and technological capacity building in anticipation of the development of regional or global mechanisms for REDD+. Numerous donor-driven REDD+ initiatives have been set up, including: multinational funds such as the World Bank Forest Carbon Partnership Facility (FCPF) with USD 220 million for capacity building and co-financed demonstration projects in 37

countries, and the Congo Basin Forest Fund (CBFF) with USD 165 million to finance sustainable forestry, development, and emission reduction projects in the region; and bilateral agreements, for example Norway has agreements with Indonesia and Brazil worth USD 1 billion each for verifiable reductions in deforestation. Japan has pledged more than USD 5 billion to REDD+ projects. These financial and institutional commitments represent a significant scaling up of efforts to tackle climate change and thus for green economic activity, although the overall impact of these opportunities on economic growth will depend upon how public finance is used.

In addition to international climate change agreements there were also agreements by the 192 countries party to the Convention on Biological Diversity (CBD). Agreement reached at Nagoya in October 2010 set out a 10-year strategic plan to put the world on a path for fairer and more sustainable use of biodiversity. One of the major outcomes from Nagoya was a commitment to increase protected areas to 17% of the terrestrial land surface and 10% of marine environments by 2020 (up from 13% and 1% respectively in 2010). The funding mechanism is expected to be confirmed by 2012, but pledges are already being announced, including USD 2 billion from Japan. In addition the negotiations outlined the requirement for Access and Benefit Sharing agreements governing the use of genetic and biological resources, as well as traditional knowledge. To date biodiversity protection has been the 'poor relation' to climate change but these commitments should help to change the way businesses value natural capital, and will help ensure that local and indigenous communities can benefit economically from their resources, providing new opportunities for sustainable use and green economic growth.

To undergo a transition to long-term sustainable models of green growth which genuinely address the drivers of GHG emissions, biodiversity loss and poverty it is important that this funding is not used in silos. Rather it should be managed using an integrated national and regional development planning structure which incorporates all of the five dimensions of green growth simultaneously and in an interconnected manner.

3. The economic value of nature

Understanding of the economic value of nature has advanced dramatically in recent years. Led by a major international initiative - The Economics of Ecosystems and Biodiversity (TEEB) – these advancements have provided evidence of the economic imperative to conserve and enhance ecosystems, and suggested practical actions for specific user groups to this end.

Ecosystem services are the benefits that businesses and communities receive from nature. These can be categorised as: 'provisioning services' (also known as ecosystem 'goods') such as food, fibre and fuel; 'regulatory services' including local and global climate regulation, pollination and erosion control; 'cultural services', such as recreational and aesthetic services; and 'supporting services' like soil formation and primary production which underpin and enable the other ecosystem services. Beyond these discreet categories bio-diverse ecosystems also provide 'resilience', for example to the impacts of climate change.

Ecosystem services have great value. In the case of the tangible outputs of ecosystems such as wood and various forms of food this value is immediately apparent; end products such as timber and food have prices and are traded in markets. While this market price may not always be a true reflection of the value of these products they at least have a place in conventional economic decision making. The value of other services provided by ecosystems is not always so obvious. Vegetation and soils have long acted as a sink for vast quantities of carbon and only recently have we started to appreciate that this has a value in terms of mitigating climate change. Coastal ecosystems such as mangroves provide protection from storm surges but often this value only becomes apparent when the ecosystem is removed and storm damage increases. The cost of alternative engineering solutions to protect coastlines, or the incremental cost of damages can both be used to estimate the 'value' provided by coastal ecosystems. Figure 1.3 below summarises how most economies currently account, or fail to account, for the value ecosystem services.

Figure 1.3: The invisible value of nature

Provisioning services

Food, fibre and fuel ▶ Market values – known and generally taken into account in decision making

Water provision
Genetic resources ▶ Value historically overlooked (private sector exceptions)

Regulating Services

Climate regulation ▶ Value long ignored, now being understood

Water and waste purification
Air purification ▶ Value often overlooked
Erosion control

Natural hazards mitigation ▶ Value often appreciated only after service gone
Pollination
Biological control

Cultural Services

Aesthetics, recreation, tourism ▶ Value sometimes implicit in markets

Cultural and inspirational services ▶ Values rarely calculated

Supporting Services

Soil formation

***+ Resilience**: e.g. to climate change*

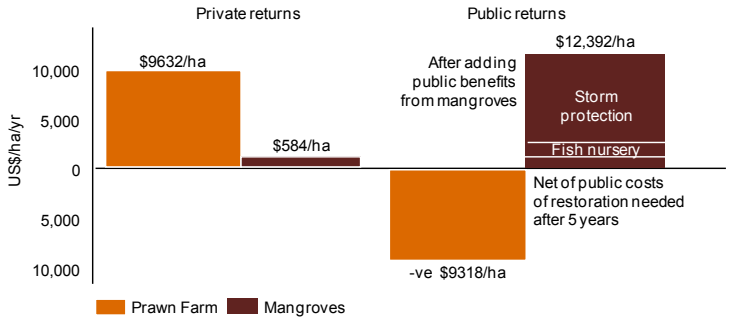
The non-market value of ecosystems can be significant and a stark difference can exist between the private and public returns from an ecosystem and a competing economic activity. This difference is illustrated by the case study of coastal mangrove forest conversion to prawn farming in Thailand (see case study 1.1.) but has lessons for other ecosystems such as the forests of the HoB. Similar studies could be used to demonstrate the economic basis of comparable trade-offs occurring between native forests and competing activities in the HoB.

Case Study 1: Public versus private returns to mangrove forest and prawn farming

Looking first at private returns the case for a prawn farm looks good; private profits accruing to the prawn farmer appear to justify a decision to convert when set against the modest value of food and fuel foraged by local communities from the intact mangrove. But digging a little deeper we discover that most of the private profit actually comes in the form of subsidies from the government; a transfer of public funds. If we take away the subsidy element the remaining private returns to the prawn farm are USD 1,220 /ha/yr; still greater than the private returns to the same area of mangrove forest, but not such a clear cut conversion decision, particularly if we take into account the distribution of benefits from those two competing land-uses.

However, that is not the end of the story. Firstly, it transpires that in many cases, prawn farming ceases to be profitable after around five years; prawn ponds become too degraded and are abandoned, leaving the public to pick up the significant rehabilitation costs. Integrating this cost makes prawn farming look less economically attractive. Secondly, and even more significantly; if we take into account the invisible value of mangroves – the value of just a couple of the ecosystem services out-lined above – as a nursery for valuable offshore fish stocks, and as a protective barrier from storm surges and other extreme weather events, it becomes clear that the public value of intact mangrove forest greatly exceeds the private returns to prawn farming. This analysis calls into question the original conversion decision and notably that it does not include any value for the most talked about ecosystem service of the moment; the ability of vegetation such as mangrove forest to sequester and store large quantities of carbon dioxide, in the process helping to mitigate climate change.

Figure 1.4: Public and private returns to a mangrove forest and a prawn farm in southern Thailand

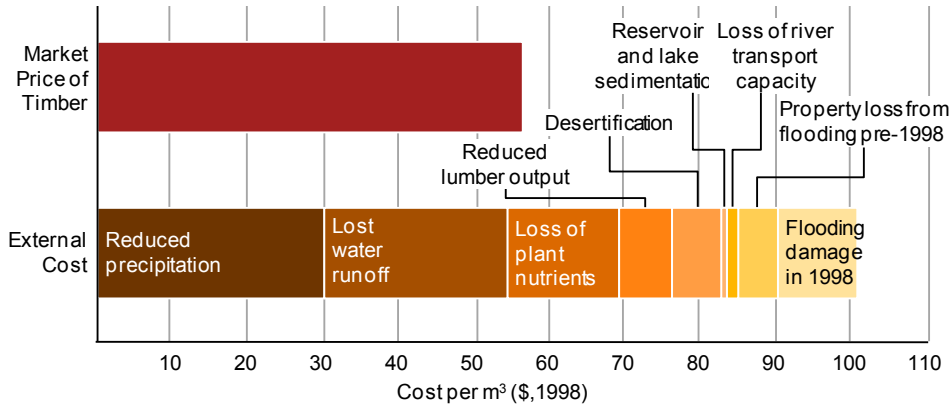


Source: TEEB, 2010.

Case Study 2: Market price of timber versus external environmental costs

Looking at a similar public private trade-off from a product perspective shows that even where an ecosystem service (in this case timber) does have a market price, that market price may not be a fair reflection of the societal costs associated with bringing the product to market. Figure 1.5 allocates the value of ecosystem services lost as a result of deforestation in China from 1950 – 1998 to the production of one metre cubed (m3) of timber. For the timber producer these costs were 'externalities' and therefore unlikely to be considered. If we add the private costs of bringing the timber to market the 'true' marginal cost of timber production in China may have been almost three times the prevailing market price during this period. In 1998 the Chinese government banned domestic logging and timber imports (particularly from Russia and Indonesia) increased significantly. China effectively 'exported' the external costs associated with logging to other markets, and while the price of timber in China did increase, the increase was not nearly sufficient to offset the external costs shown in figure 1.5. While a total logging ban is a drastic step which in the case of China simply shifted the loss of value elsewhere, strong forest policy and new financial incentives which reward standing forest can be an effective means of 'internalising' these values.

Figure 1.5: Comparing the market price of timber with its external environmental costs

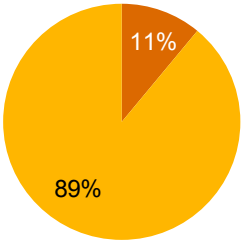


Source: TEEB, 2010

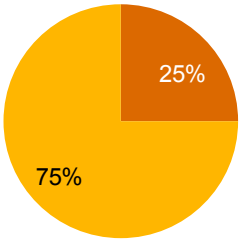
Some ecosystem services do appear in national accounts and this is most apparent in the outputs from primary industries such as agriculture, forestry and fisheries. However, an important finding of many studies recently reviewed by TEEB is the much more significant contribution of forests and other ecosystems to the livelihoods of poor rural households, and therefore the significant potential for conservation efforts to contribute to poverty reduction, as part of the transition to a green economy. For example, as figure 1.6 below illustrates it has been estimated that in Indonesia ecosystem services and other non-marketed goods account for 75% of the so-called 'GDP of the poor' (i.e. the effective GDP or total source of livelihood of rural and forest-dwelling poor households), whereas in national GDP agriculture, forestry and fisheries account for only around 11%. This is because standing forests generate multiple flows of value tending to be in the form of non-marketed *public goods* which directly accrue to poor rural households, such as flood protection, food, shelter, fuel and fibre (see figure 1.5 above).

Figure 1.6: Ecosystem services in GDP vs. 'GDP of the poor'

Share of agriculture, forestry, and fisheries in classical GDP



Ecosystem services as a percentage of 'GDP of the poor'



Source: TEEB for National Policy, Chapter 3 (NB: Rural poor population considered in 'GDP of the Poor' 99 million)

Whilst the idea of payments for ecosystem services has influenced some policies in the past (e.g. the use of European agricultural subsidies to pay farmers for environmental benefits), TEEB has heavily influenced the international conservation agenda – indeed, TEEB is explicitly referenced in 17 of the 48 decisions of the 10th Conference of the Parties to the CBD. But TEEB is also influencing policy making at a broader level as national and international policy makers increasingly recognise the value of nature to their economies. For example, India has commissioned a full analysis of its natural capital and is trailing market based pollution control policy in three states (Tamil Nadu, Gujarat and Maharashtra). The UK is also due to release the National Ecosystem Assessment in 2011 including a comprehensive valuation of ecosystem services to help guide policy making. Smaller scale NGO led and government supported initiatives are also underway in Canada, China, Colombia, Ecuador, Indonesia, Tanzania, and the United States. Partly inspired by the work of TEEB, greater recognition of the economic value of ecosystem services accompanied by appropriate policy reform is central to a successful transition to a green economy.

Furthermore, the World Bank recently launched a five-year ten-country pilot programme to develop mechanisms for integrating ecosystem valuation into national accounts - to be reported alongside GDP and other conventional measures. Businesses are also taking note; many have begun the process of assessing their impacts on biodiversity and ecosystems, and perhaps even more significant, some have started to evaluate the extent to which their business models depend on the free services provided by nature. The World Business Council for Sustainable Development's (WBCSD) Corporate Ecosystem Valuation Initiative is a good example of a direct business response to TEEB. It brings together 15 major corporates to test economic approaches to valuing ecosystem services in a corporate context with the aim of improving corporate decision making.

4. Demand for low carbon and environmental goods and services worldwide

Demand for low carbon and environmental goods and services, from business, governments and non-governmental organisations, is increasing rapidly. This increase in demand has multiple drivers, including resource scarcity, awareness of the impacts of pollution, legislation in response to the threat of climate change and globally rising incomes leading citizens to demand higher environmental standards at both the regulatory and consumer goods level. Numerous examples exist: localised potable water shortages are driving demand for water-efficient and desalination technologies; the Chinese government has recognised the likelihood of future commodity shortages, buying equity in natural resource firms and writing long-term procurement contracts for minerals and oil; questions over the remaining stock of easily extractable oil augment global concerns over carbon emissions from the combustion of fossil fuels to provide a convincing case for clean energy technologies; consumer and NGO pressure on consumer-goods companies has resulted in the formation of such organisations as The Roundtable on Sustainable Palm Oil, the Forest Stewardship Council and the Marine Stewardship Council.

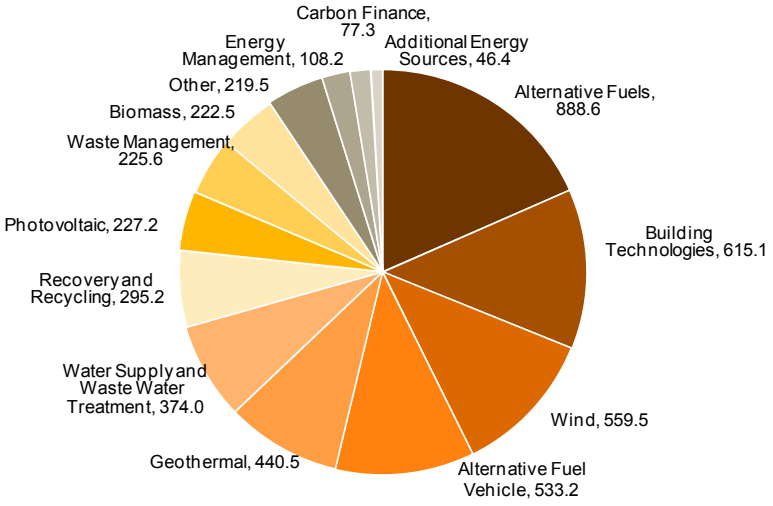
Businesses are increasingly responding strategically to the risks and opportunities resulting from the consumption, degradation and destruction of natural capital. This response goes beyond corporate social responsibility and additionally seeks to develop new business solutions, build resilience in supply chains, reduce exposure to shareholder and stakeholder pressures, and respond to changing consumer demand. Businesses both large and small are actively pursuing greener practices. Table 1.3 below provides a snapshot of some of the many business practices that are changing to be more sustainable.

Table1.3; Business leadership in the green economy

Walmart carbon commitment	The retailer has committed to reducing 20 million metric tons of carbon pollution from its products' lifecycle and supply chain over the next five years. That's equivalent to the annual greenhouse gas emissions from 3.8 million cars.
Natura responsible supply chain	Brazil's largest cosmetics company committed to consider sustainability in all processes: ingredients are sourced through local communities in Brazil's Amazon region, no animal testing and all products carry "environmental labeling.
Vestas low cost technology transfer	Denmark-based wind energy generator that is rapidly expanding its presence in China and contributing to bringing the latest technology to an emerging market at low cost.
Sime Darby	The world's largest producer of palm oil is a founding member of the Roundtable on Sustainable Palm Oil (RSPO), which provides certification for palm oil producers which meet their sustainable environmental and social criteria. Sime Darby aims to have all its plantations certified by the end of 2011.
Consumer Good Forum	The independent global parity based consumer goods network identifies and seeks solutions to key consumer goods issues. It's work includes sustainability solutions, for example pledges for deforestation free supply chains.

Together these responses are contributing to the significant global growth of the low carbon and environmental goods and services (LCEGS) markets, which were worth USD 5 trillion in 2008-2009, creating over 28 million jobs.[6] Energy, technology and infrastructure are the most lucrative LCEGS sectors, with alternative fuels worth more than USD 890 billion, and building technologies USD 615 billion. Other environmental markets such as waste management and biomass also represent a significant portion, both worth more than USD 220 billion. Other niche but growing markets include habitat banking, offsets, and payments for ecosystem services - these have grown rapidly in recent years and trade more than USD 6.5 billion annually.[7] Carbon markets are arguably the subset of ecosystem services markets which have attracted most interest in recent years. Some existing carbon trading schemes have expanded and new schemes implemented, in particular for forest carbon projects, both in the voluntary and compliance carbon markets. The recession and ongoing policy uncertainty has put some developments on hold, most notably in the USA, however, the volume and value of the voluntary (USD 338 million) and particularly the compliance (USD 144 billion in 2009[8]) markets is significant.

Figure 1.7: Global LCEGS sales by sub-sector 2008/09, USD million



Source: BERR, UK

[6] http://www.bis.gov.uk/files/file50253.pdf

[7] OECD, 2010

[8] http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/AGF_reports/AGF%20Report.pdf

The USA, China, Japan India and Germany together account for half of the global market value for LCEGS[9]. Table 1.4 below sets out a country breakdown of the top 25 markets. The outlook for LCEGS remains bright, taking into account different growth rates for more than 220 global economies, it is estimated that overall the global LCEGS sector grew by approximately 4% in 2009, which for many countries was a year of recession. Growth is forecast to continue at 4% p.a. for 2010-2015 despite the downgrading of growth forecasts due to recent economic circumstances.

Table 1.4: LCEGS market value

Ranking	Country	Market value £bn	% total
1	United States	629.12	20.61
2	China	411.23	13.47
3	Japan	191.26	6.26
4	India	190.81	6.25
5	Germany	127.58	4.18
6	United Kingdom	106.72	3.5
7	France	92.9	3.04
8	Spain	83.29	2.73
9	Italy	81.99	2.69
10	Brazil	79.54	2.61
11	Russian Federation	77.23	2.53
12	Mexico	55.18	1.81
13	Canada	54.2	1.78
14	Korea, South	49.76	1.63
15	Indonesia	43.86	1.44
16	Taiwan	35.05	1.15
17	Australia	30.85	1.01
18	Argentina	27.92	0.91
19	Thailand	27.07	0.89
20	Iran	27.06	0.89
21	South Africa	26.93	0.88
22	Turkey	26.52	0.87
23	Netherlands	25.87	0.85
24	Poland	23.97	0.79
25	Philippines	21.84	0.72

Source www.berr.gov.uk

5. Green Economy Initiatives

The last few years have seen a proliferation of green economy initiatives, both public and private, at the national and international level. The common aim of such initiatives is to improve prosperity in an environmentally friendly and socially inclusive way, although the individual emphasis of green economy initiatives varies. Some focus on analysis and evidence (e.g. ESMAP, Project Catalyst, US Government Low Emissions Development Strategies), some on capacity building and advice (e.g. UNEP, UNESCAP), some on skills and knowledge , i.e. green jobs (e.g. HSBC, the ILO, Worldwatch), some on policy (e.g. OECD) and other on partnerships (e.g. the Green Economy Coalition). These initiatives have contributed to the understanding of green growth and to progress in greening economic activity worldwide. However most are still relatively new and work is ongoing. A selection of green economy initiatives are considered in more detail below.

[9] http://www.berr.gov.uk/assets/biscore/business-sectors/docs/10-795-low-carbon-environmental-goods-analysis-update-08-09.pdf

Analysis and evidence: A number of green growth studies have been undertaken in recent years. Some studies are dominated by a particular focus, e.g. carbon, whilst others attempt to combine different elements of green growth, e.g. carbon and jobs or mitigation and adaptation. An overview of a selection of studies is provided in Table 1.5 along with an indication of their focus.

Table 1.5: Scope of green growth studies

	Economic growth	Low carbon growth	Climate change resilience	Biodiversity and Ecosystem services	Social development and poverty alleviation
ESMAP Low Carbon Growth Country Studies	✓	✓	✗	✗	✗
Climate Works & European Climate Foundation: Low Carbon Growth[10]	✓	✓	✓	✗	✗[11]
OECD Interim Report of the Green Growth Strategy	✓	✓	✓	✓	✓
UK Government Low-Carbon Transition Plan	✓	✓	✓	✗	✗[12]
UNESCAP Integrated Policy Approaches	✓	✓	✓	✓	✓
Kenyan National Climate Change Response Strategy	✗	✓	✓	✗	✗
East Kalimantan low carbon growth strategy	✓	✓	✓	✗	✗

Despite some variation in focus, studies of green economic growth coalesce around five dimensions - economic growth, social development and poverty alleviation, climate resilience, greenhouse gas emissions, and biodiversity and ecosystem services. These were recognised at the 2010 OECD Ministerial Meeting which considered the inclusion of the five dimensions as an optimal approach to the analysis and decision-making process for meeting the needs of the current generation without compromising future generations. However, **few studies actually look at green growth as a holistic proposition which incorporates all these dimensions**.

Consideration of all five dimensions in green growth studies, as depicted in figure 1.1 is recommended. Interactions between the dimensions illustrate the kinds of changes that could be expected to arise from the implementations of interventions (policies and practices) designed to address each of the five dimensions and together the five dimensions describe the process of transitioning to a green economy. This framework for analysis is similar to sustainable development. The primary differences are the degree of emphasis on natural capital based economic opportunity, and crucially the central importance of growth. Economic potential and opportunity are given equal accord to conservation, and so the framework seeks to exploit opportunities that are favourable to both opportunities, rather than simply green an existing economy. The dimensions can be used as an analytical framework (see Section 3), to develop targets and as indicators to measure success against those targets (see Section 4).

Green economy studies also vary in the methods employed for analysis and decision-making. For example, some are primarily desk based whilst others are based on extensive stakeholder engagement. Often studies employ highly technical modelling. Different methods will suit different needs and contexts and ultimately the usefulness of approaches depends on the quality of the evidence collected and its interpretation. Buy-in from key decision-makers to the analytical and decision-making tools adopted and the capacity to use such tools is essential to their value. Improved understanding is needed of the full range of methodologies that exists, their

[10] This is a review of country NAMAs and NAPAs rather than external green growth studies

[11] The study notes the problem of "policy wishlists" with no clear integration between social, economic and environmental dimensions

[12] Within a developed country context, this is not about poverty alleviation per se, but shielding poorer households from energy price increases

relative merits and limitations for applicability in a variety of contexts and how to go about selecting the most appropriate methodologies. A forthcoming review by the Climate and Development Knowledge Network (CDKN) will examine the range of green growth methods to assess their suitability for analysis and decision-making.

Collaboration: The transition to a green economy can be supported through forums that connect and engage relevant stakeholders for informed debates, the outcome of which is then shared with decision-makers. The Green Economy Coalition is an initiative that brings together environment, development, trade union, consumer and business sectors around the world with the common objective of accelerating a transition to a new green economy. Activities include: engaging public perceptions of a green economy and providing a platform for debate and communicating with heads of states on environmental issues at the G20 summit.

In the UK, the Green Alliance creates alliances with relevant businesses, third sector bodies and academics to persuade key players in all three political parties that there are attractive opportunities to use policy to drive pro-environmental behaviour change.

In Asia, the Global Green Growth Institute (3GI) was set up by President Lee Myung-bak of South Korea in 2010 to help developing countries 'develop and implement green growth strategies and policies, and to engage in analytically sound, fact-based activities to spread green growth practices and approaches as a new growth paradigm around the globe'. 3GI services to governments include policy advice, economic assessment and best practice sharing including in-country presence and initiatives.

Internationally, there are a number of 'roundtables' which focus on bringing together stakeholders from specific sectors to address sustainability issues. The Roundtable for Sustainable Palm Oil (RSPO) is one such example that unites stakeholders from across the palm oil industry in order to develop and implement global standards for sustainable palm oil. Other initiatives are sector wide, such as the CDKN; an alliance of six private and not-for-profit organisations which fosters and supports local partnerships, and provides access to the best available expertise in the climate change and development field. CDKN's processes are stakeholder-rich, allowing buy-in from key decision-makers and making action more likely.

Skills and Knowledge: There is a growing awareness that tackling environmental challenges will have a fundamental impact on economies and the job market. Solutions must be considered to adapt to the opportunities and cushion any negative impacts. Needs will vary from one economy to another; however, three areas that feature repeatedly are:

1. The greening of existing industries – making conventional business, including primary resource extraction, sustainable;
2. Creation of sustainable livelihoods for land-use dependent economies; and
3. Economic diversification – the creation of new innovative business opportunities not based on forest/land-conversion.

Green jobs include opportunities for managers, scientists and technicians in particular in the first and third categories above, however many other sectors of the workforce can benefit from green economic job opportunities, such as farmers, rural populations, builders, retailers and the informally and irregularly employed. Rural populations in particular require the creation of green jobs in the second category above.

The International Labour Organisation's joint initiative with UNEP and the International Trade Union Confederation (Green Job Initiative), aims to assess, analyse, and promote the creation of jobs as a consequence of the need for new environmental policies and practices. It supports a concerted effort by governments, employers and trade unions to promote environmentally sustainable jobs and development in a climate-challenged world. Other NGO efforts in providing research and campaign on the topic include Friends of the Earth's Green Economy Campaign and the World Watch Institute's Green Economy Program.

There are also initiatives aiming at supporting private sector transition to a green economy. WWF's Market Transformation Initiative for example aims to change the way key commodities are produced consumed and financed. In collaboration with major companies throughout the supply chain, the initiative aims to develop new standards for sustainability e.g. FSC and RSPO to promote better management practices and to collaborate

with these companies to drive implementation of these standards. As part of this, WWF recently launched the Green Business Network to catalyse action on sustainable business practices in the HoB..

Policy: NGOs and intergovernmental organisations have been providing analysis and recommendations to assist governments' green growth policy development. These projects typically come in the format of a report or guidance document to help governments identify the policies that can help achieve the most efficient shift to green growth. The OECD's forthcoming Green Growth Report for example will focus on a number of key issues that policymakers face in a greener economy and presents possible options to overcome the various challenges. Other examples include UNEP's initiative on the integrated assessment of trade-related policies and biological diversity in the agriculture sector which provides a guidance manual on how to incorporate biodiversity in trade policy assessments in the agricultural sector, with the practical application of policy assessments in six ACP countries, including Cameroon, Jamaica, Madagascar, Mauritius, Uganda and Papua New Guinea. Sector specific policy support initiatives have also been introduced to help governments make effective and informed decisions. For example WWF's 'The Energy Report: 100% renewable energy by 2050', provides a vision for the world's energy system to minimise its impact on nature and natural resources, as well as on the climate.

Policies commonly considered catalytic to the progression towards a green economy include fiscal incentives such as systematic taxation of fossil fuel-based energy, subsidies to renewable energy consumption and infrastructure, government support for R&D into environmental technologies, and non-fiscal such as strengthening property rights over natural resources, environmental product labelling, and legislation to enable Payments for Ecosystem Services.[13] Some examples are included below.

Market pricing of fossil fuels

G-20 and IEA last year called for elimination of fossil fuel subsidies globally by 2020

Tackling deforestation

Indonesia has set a target to reduce carbon emissions by 26%, to be met principally through reduced deforestation

Payments for Ecosystem Services

Bolsa Verde legislation in Brazil identifies potential PES participants and creates synergies with existing support programmes

Managing scarce resources

New Zealand has implemented tradable Fishing Quotas covering more than 30 commercial species, helping ensure sustained revenues

Green Buildings

Indian Green Building Council encourages, facilitates and certifies reduced environmental footprints for India's buildings

Renewable Portfolio Standards

China insisting that 15% of energy come from renewable sources by 2020

Conclusion

Together the drivers of green growth constitute a paradigm shift in the economic opportunity presented by markets, governments and private and non-governmental sector actors for decoupling economic growth from ecosystem degradation and depletion. Expectations for the future are high – markets are predicted to grow, developing countries are anticipating funding from donors, businesses are positioning themselves for supply and demand changes driven by the green economic agenda and global fora, such as the Rio+20 gathering, will be showcasing iconic examples of green growth.

Governments, businesses and civil society all have a role to play as the various green growth initiatives and donor programmes have demonstrated. As the summary of green economy initiatives in Table 1.6 below shows, efforts to support the transition to a green economy coalesce around a number of **critical success factors, namely policy, skills and knowledge for green jobs, collaboration, analysis and evidence.** The importance of **finance** is demonstrated by the unprecedented commitments from governments at Copenhagen/Cancun and Ngoya to address climate change and biodiversity respectively.

[13] UNEP *Driving a Green Economy Through Public Finance and Fiscal Policy Reform* (http://www.unep.org/greeneconomy/Portals/30/docs/DrivingGreenEconomy.pdf)

Table 1.6: Supporting green growth initiatives

Organisation	Name of initiative	Type
UNEP	Green Economy Initiative	Analysis and evidence, Collaboration, Policy, Finance
Green Economy Coalition	Green economy coalition	Collaboration, Policy
OECD	Green Growth Strategy report	Analysis and evidence
ILO, UNEP, IUTC	Green jobs initiative	Knowledge and Skills
Friends of the Earth	Green economy campaign	Knowledge and Skills, Analysis and evidence, Policy
Green Alliance	Sustainable Economy	Knowledge and Skills, Finance, Policy
World Watch Institute	Green Economy Program	Knowledge and Skills, Policy
UNESCAP	Green Growth Capacity Development Programme	Policy, Analysis and evidence
CDKN	Comparative Analysis of planning methodologies	Analysis and evidence, Collaboration
3GI	Global Green Growth Initiative	Skills and Knowledge, Analysis and evidence

Changes in policies and practices are at the heart of the transition to a green economy but depend on robust decision making frameworks to help address the multiple dimensions of success in a green economy. Implementation of these policies and practices requires a skilled and knowledgeable workforce, finance and partnerships across the public, private and civil society sectors. This will take time and require considerable, coordinated effort. However, ignoring the opportunities for green growth is a risk few, if any, governments and businesses can afford to take. These opportunities are not evenly distributed. Countries are endowed with different levels of natural, physical and financial capital, and have different policy priorities. In Section 2 we explore these capital classes and green economy opportunities in the Heart of Borneo, with particular reference to the significant natural capital that exists in the HoB.

Section 2: The green economy opportunity in the Heart of Borneo

Section 2: The green economy opportunity in the Heart of Borneo

Introduction

The HoB is a global biodiversity hotspot where intact tropical forests can still be protected on a large scale (approximately 22 million hectares). This has been recognised by the governments of Indonesia, Malaysia and Brunei Darussalam in the Declaration. The rich natural capital of the HoB is also a primary source of economic growth; a priority for national governments. But the rate of use of this natural capital is unsustainable. It is being used at a rate much faster than it can re-generate or in a way which destroys it for good. A green economy aims to ensure the sustainable use and maintenance of natural capital to support national priorities such as poverty alleviation, climate adaptation and food and energy security. The international community, businesses and NGOs have all shown interest in supporting the Declaration as well as other national and international priorities such as greenhouse gas reduction and meeting the Millennium Development Goals. However, realising this opportunity will depend on the three HoB governments integrating the HoB goals into national and local development plans and business practices and directing the available funding and support in a way which meets their long term economic and social development goals. In this section we assess the green economy opportunity in the HoB with reference to the critical success factors needed for green economic transformation.

The Heart of Borneo Initiative: A Declaration from the Governments of Indonesia, Malaysia and Brunei Darussalam

In 2005 recognition of the value of Borneo's biodiversity was made at the ASEAN summit in Kuala Lumpur. This was followed by Presidential assurance from Indonesia that palm oil would not be allowed to "interfere" with the HoB and Malaysia placing an area of approximately 238, 000 hectares under sustainable forest management. In March 2006 the HoB Initiative was officially launched at the Convention for Biological Diversity by the Governments of Brunei, Indonesia and Malaysia and in February 2007 the formal declaration was officially signed between the three Bornean governments. These events led to the establishment of a co-ordination process, based on annual trilateral meetings, which in turn led to the formation of the HoB Strategic Plan of Actions in 2008.[14]

Figure 2.1 illustrates the HoB vision enacted in the Declaration and its three high level objectives and five programmes for action. The programmes for action include the activities formally agreed upon by the three governments. These are elaborated upon in table 2.1[15].

Each of the three countries has created a unique governance structure under the Declaration; the National Council in Brunei, the HoB Working Group in Indonesia and National Expert Group and Steering Committee in Malaysia. The HoB initiative is coordinated through a revolving secretariat of the three nations. The principles of the secretariat were established during the first and second trilateral meetings in 2007 and 2008. To date four trilateral meetings have been held, with the most recent focusing on finalisation of national plans and the finalisation of institutional arrangements for their implementation (Strategic Plan of Action or Project Implementation Framework).

[14] WWF Indonesia Website

[15] Tri-lateral Strategic Action Plan

Figure 2.1. The HoB vision, objectives and programmes

The heart of Borneo vision

"With one conservation vision and with a view to promote people's welfare, we will cooperate in ensuring the effective management of forest resources and conservation of a network of protected areas, productive forests and other sustainable land-uses within an area which the three respective countries will designate as the 'Heart of Borneo', thereby maintaining Bornean natural heritage for the benefit of present and future generations."

Objective 1	*Objective 2*	*Objective 3*
Sustainable natural resources management of cross boundary resources	Implementation of supporting policy and law enforcement	Promoting welfare, education and development for locals

Agreed programmes

- Transboundary Management
- Protected Areas Management
- Sustainable Natural Resource Management
- Ecotourism Development
- Capacity Building

Source: PwC

Table 2.1. Agreed Programmes

Transboundary Management	"to address issues of management of natural resources and socio-economic welfare of local people on the border areas"
Protected Areas Management	"to enhance and promote effective management of protected areas within the HoB area, with the emphasis at those situated on the common border, in order to conserve and maintain forest biodiversity and the ecological linkages"
Sustainable Natural Resource Management	"to manage the natural resources outside the protected areas network through the development and implementation of sustainable land uses."
Ecotourism Development	"to recognise and protect the value of special natural and cultural places or sites within the HoB area."
Capacity Building	"to ensure the effective implementation of HoB initiative at all levels, both public & private sectors and at the local community"

The importance of Heart of Borneo to national and regional priorities in Indonesia, Malaysia and Brunei Darussalam

The importance of the HoB is greater than its status as a global biodiversity hotspot. Although the Declaration is not expressed in economic terms, the HoB contributes to the economic success of Indonesia, Malaysia and Brunei Darussalam and supports wider national priorities such as alleviating poverty enhancing energy and food security. This wider importance of the Declaration to the three governments is considered below.

Malaysia

The main emphasis in the 10th Malaysian Plan (10MP) is on GDP, with the growth target to 2015 of 6% p.a. The government has prioritised specific sectors for growth, which include services and primary production. Palm Oil is one of the National Key Economic Areas, and improving the industry's sustainability (yield being a core concern) is explicitly given as an objective. Whether this is achieved or not will impact upon the success of the Declaration, given the link between palm oil and the degradation of natural capital. Failure could undermine long-run GDP growth and standards of living as well as depleting natural capital irreversibly. There are potential synergies between the 10MP and the Declaration, most notably the government's aim to establish Malaysia as a "Global Biodiversity Hub". However, the Economic Transformation Programme (ETP), which outlines implementation routes ("Entry Point Projects") to achieving 10MP, does not include HoB-specific priorities, with the exception of an eco-tourist resort in Sabah and references to tapping Malaysia's hydroelectric potential. There is an absence in the ETP of projects to address natural capital depletion or preserve biodiversity.

Overall, however the 10th Malaysian Plan (10MP) recognises that "the key to sustainability is a proper valuation of our environmental resources". Specifically, the government focuses on the link between ecosystem preservation and business operations, offering to "ensure that Malaysia's environmental assets and ecological resources are managed sustainably". The government is pushing for greater exploitation of opportunities provided in international carbon markets. Wider fiscal support is offered, with market pricing of fossil fuels promised (i.e., the scrapping of fossil-fuel subsidies), Feed-In Tariffs for renewables are guaranteed and broader fiscal support for green technology committed. Eco-tourism is strongly advocated as a method of increasing growth whilst specifically benefiting local communities, reducing reliance on carbon-intensive industry, and providing the appropriate financial incentives to preserve ecosystems. The government has also started to consider adaptation to climate change. Particular concern is shown in general for the plight of the bottom 40% of the income distribution and widening inequalities in the country. These national priorities can both support and be supported by the goals of the Declaration.

At the sub-national level there is some interaction between the Declaration and regional priorities. For example, the Sabah Forestry Department seeks to make logging more sustainable, overseeing the MYR 5 million performance bonds for new forestry operations. Long-term Socio-economic development is the purpose of the Sarawak Corridor of Renewable Energy (SCORE) plan, which is supported by the Declaration in terms of achieving rural growth, generating electricity sustainably, and moving towards a service-based economy (though SCORE does promote large-scale hydro-power, heavy industry and industrial development which may be at odds with the Declaration if careful planning and strict sustainability standards are not put in place).

Indonesia

Indonesia is currently in the process of designating the HoB as a national strategic zone, *Kawasan Strategis Negara*; the first time that an area has been identified as such for its natural value (usually such areas are trade or military zones). Indonesia has also internalised the Declaration into its National Forestry Strategic Plan of Action, demonstrating that specific institutional responsibility is being delegated for the HoB.

In 2007 Indonesia published its National Action Plan Addressing Climate Change (NAPACC) covering both mitigation and adaptation. It specifically cites the Declaration as a policy measure aimed at supporting "mitigation and adaptation simultaneously". The NAPACC is supported by a national energy policy which aims to generate 17% of electricity from renewables by 2025. Given 5.8 million people in Kalimantan still did not have access to electricity in 2006[16] the electrification of Indonesian Borneo using renewable energy presents an opportunity to achieve national targets.

Furthermore, in September 2009[17]the government publicly pledged to reduce carbon emissions from their Business-as-Usual levels in 2020 by 26%, or 41% assuming sufficient international finance is provided. The upper commitment was based on 26 percentage points coming from land-use and forestry sector changes[18], of which the HoB could play a major role. This concern for climate change is echoed at the regional level, with both the Central and East Kalimantan governments commissioning low-carbon growth strategies. For example, the strategy published by the Governor of East Kalimantan and DNPI propose a series of 29 priority initiatives which could together lead to reduction of 178 Mt relative to Business-as-Usual whilst, for example, increasing agricultural GDP by IDR 3.2 trillion by 2030.

Indonesia has also taken steps to better value its natural capital, only last year transferring responsibility for illegal logging to the an anti-organised crime and anti-corruption unit and generally increasing the attention of law enforcement on the forestry sector[19]. However, the government is strongly committed to palm oil, explicitly aiming to remain the world's largest producer, and witnessing constant growth rates of output over the decade to 2008[20]. To fulfil national production target of 40 million tons crude palm oil by 2020, it is estimated that 5

[16] Source: International Energy Agency http://www.iea.org/textbase/nppdf/free/2008/Indonesia2008.pdf

[17] Source : Jakarta Globe http://thejakartaglobe.com/national/indonesias-carbon-reduction-goals-a-tall-order-expert-claims/334149

[18] Source : Jakarta Globe http://thejakartaglobe.com/national/indonesias-carbon-reduction-goals-a-tall-order-expert-claims/334149

[19] Embassy of Indonesia April 2010 http://embassyofindonesia.it/president-sby-orders-taskforce-against-court-mafia-to-handle-illegal-logging-mafia/

[20] http://www.pecad.fas.usda.gov/highlights/2007/12/Indonesia_palmoil/

million hectares is required[21] in addition to the current 6-8 million hectares[22]. However, in May 2010 the President announced policy to produce this palm oil on degraded land. Mining and quarrying make up over 10% of Indonesia's GDP[23] most of which is open cast and requires clearance of forest. The forestry sector grew at an annual real rate of over 17% from 2004-2009[24]. These extractive sectors have a large ecological footprint that if not reduced will degrade and deplete the natural capital asset base.

Brunei Darussalam

The national economy is almost entirely based on oil and gas, with very little poverty and excellent social security for the people. There is, however, a national policy for diversifying the economy away from its over-reliance on one sector. In Wawasan 2025, the government's long-term Vision for the Economy, emphasis is placed on the importance of "an environmental strategy that ensures the proper conservation of our natural environment and cultural habitat" together with an assertion that Wawasan 2035, fully relies on such conservation[25]. Full details of national policy documents were not obtained for the scoping study and Brunei's action plans as part of the UNFCCC process are still under development. The 1989 National Forestry Policy explicitly states that "In pursuance of national development objectives and consistent with global strategies on bio-ecology in which the forests play a vital role, the government commits itself to conserve, develop, and manage its forest resources for the preservation and improvement of the quality of life".[26] The government of Brunei has indicated plans to diversify its economy; green growth in the HoB presents an opportunity to do so.

So far, there is relatively little development impact on forests, by comparison with the situations elsewhere, with much primary forest still standing, in spite of a lack of national capacity for conservation and sustainable natural resource management. As an exception to the overall positive scenario, wildlife hunting is a problem.

Fifty-eight percent of Brunei's land area has been designated for HoB, with a proposal currently being considered to raise that to more than 70%. There is already a national implementation roadmap for the HoB (the Project Implementation Framework or PIF). Produced by a consultancy team working for the Ministry of Industry & Primary Resources (MIPR) and funded by Brunei Shell Petroleum (BSP), it contains concepts for specific interventions that are judged to be needed, ranging from broader issues such as policies and capacities, to specifics such as site-based and species needs.

A National HoB Council has been formed, but its proposed operational arm, a Brunei HoB Centre, has yet to be established. Overall, the most pressing need is for clear holistic planning, which should be guided by the national HoB Council, with a national HoB Centre as its operational arm. The national HoB Council has met, with the Forestry Department providing its secretariat, but it has yet to initiate the kind of coherent, long-term programme that is needed.

Nevertheless, several important, on-the-ground HoB projects are underway. These include:

- The Smithsonian Climate Change Program Permanent Forest Plot at the Universiti Brunei Darussalam (UBD) research centre at Kuala Belalong. This is funded by HSBC as a contribution to the HoB. As well as providing scientific data within a global programme, it helps to provide scientific credibility, prestige and international networking for UBD and the nation, and links HoB directly to the climate change issue.
- A two-year project being carried out for the Brunei Department of Environment to generate an action plan for the peatlands within Brunei's HoB area, in the context of rehabilitating degraded areas and reducing carbon emissions. This is jointly funded by the UK Government and Standard Chartered Bank in association with WWF. It addresses a key forest management issue and has given rise to considerable media coverage and community efforts at forest conservation. It is currently nearing completion and follow-up proposals are being generated.

[21] Feed the World. Indonesian Chamber of Commerce and Industry 2010

[22] World Resource institute for Sustainable Transport http://www.embarq.org/en/node/2962

[23] Source: PwC Analysis of Indonesian National Accounts

[24] Source: PwC Analysis of Indonesian National Accounts

[25] http://www.bedb.com.bn/why_nationalvision.htm Wawasan 2035 is not publicly available

[26] The Economist "Thinking of its Future" March 19th 2008

- A two-year survey of the fauna of Sungai Ingei Protection Forest, one of Brunei's most biodiverse areas, lying adjacent to the border with Sarawak and contiguous with Mulu World Heritage Site. This project is funded by Standard Chartered Bank in association with and carried out by UBD biologists in co-operation with MIPR and the Forestry Department. Early results are showing the conservation value of this area and creating interest in its potential for both ecotourism and a permanent scientific research centre.
- The Million Trees Programme of the International School Brunei, which raises its own funds and works with various government agencies, other schools, community groups, etc, to rehabilitate degraded forests in Brunei and Sabah as a contribution to the HoB.

In addition to these projects which have been formally recognised by the HoB Council, public enthusiasm for HoB has given rise to fundraisers, nature handbooks, commentaries and other research work, involving a broad cross-section of corporations, government agencies, community groups, schools, local NGOs and individuals.

The prospects for corporate support for a green economy are good, at least to the extent that corporations are supporting the national HoB, as illustrated in the previous paragraphs. In addition, both Shell and HSBC have pledged major support for the HoB Centre when it is established; and other corporations have indicated willingness to engage with the HoB when the capacity is in place to work with them.

Natural capital in the Heart of Borneo

The HoB Initiative was developed in response to the realisations that:

- As far as forest conservation is concerned, size matters and what is now the HoB area was the only place in Southeast Asia where a large, ecologically viable area of rainforest could be conserved;
- Although forest cover was being eaten away at the periphery, the pattern suggested that it would be possible to conserve and sustainably manage a transboundary area of mostly highland forest, with lowland areas where there was ecological connectivity to the main block;
- Forest conservation *per se* would only be achieved if it were to go hand-in-hand with the sustainable improvement of rural lifestyles in a largely forested landscape, within a context of overall sustainable development at local, provincial and national levels; and
- This could only be achieved through the co-operation of the three Bornean nations.

The governments' shared vision encapsulated in the Declaration should help to maintain the value of the natural capital that exists within the HoB. To achieve the vision will require, at least in large part, a move away from a purely extractive model of economic growth that relies on natural resource depletion. Instead, through sustainable use, conservation, and building of alternative sustainable economic opportunities, the depletion of natural capital assets can be avoided or slowed, whilst at the same time enhancing the welfare of the populations living in and around the HoB and providing a reliable and sustainable revenue stream to drive economic growth.

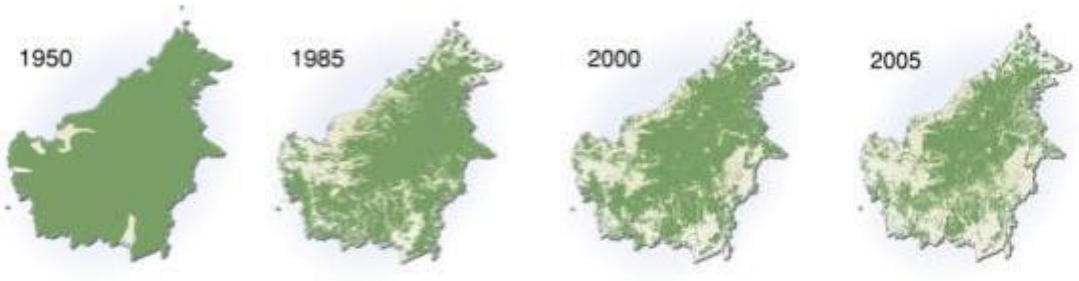
The HoB is rich in natural capital, an overview of which is set out below, including recognition of how different uses can promote or hinder green economic growth.

Forests

In 1950 forest covered most of Borneo's land area. Today, Borneo's forests cover about 50% of its land area. This represents a significant portion of the island's natural capital. However, between 1985 and 2005, Borneo lost an average of 850,000 ha of forest every year (figure 2.2).[27]

[27] WWF, *Borneo: Treasure Island at Risk*, 2005

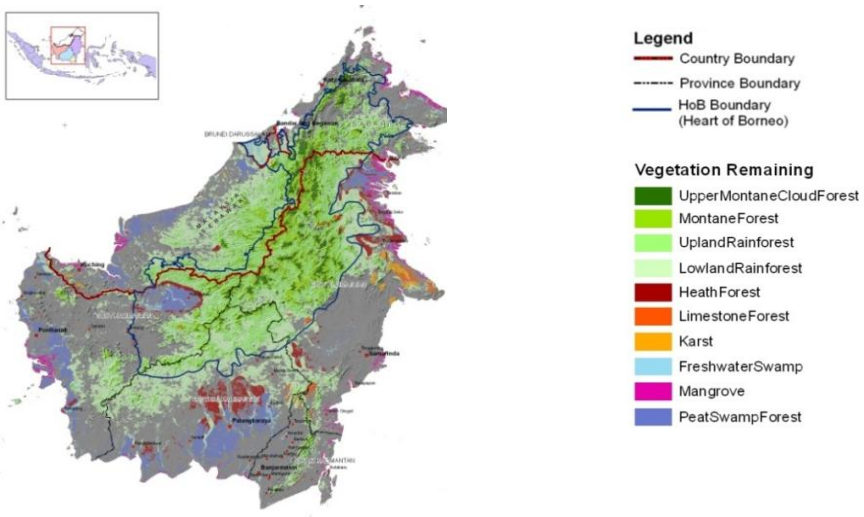
Figure 2.2. Since 1950Borneo has lost about half its forest cover



Source: WWF, 2005.

There are a number of different types of forests in the HoB, including montane cloud forest, upland rainforest, lowland forest, heath forest, peat swamps, fresh water swamps and mangroves. (Figure 2.3).

Figure 2.3. Forest cover and type



Source: WWF, 2008

Different forest types provide renewable and non-renewable value in a number of forms:

1. Timber – a renewable resource in theory, however, poor forest management can lead to land degradation which prevents effective forest regeneration and limits the future resource value and related timber revenue opportunities.
2. Carbon – Borneo's forests are a particularly important carbon store, with an average of 230 tonnes per ha in above ground biomass, and 2,400 tonnes per ha in below ground peat soils. Deforestation and land degradation results in the release of most of this carbon.[28] However, sustainable forest management is effective in minimising the lost carbon value through logging activities.[29] Figure 2.4 shows the distribution of carbon density across Borneo.
3. Water - Of the 20 major rivers in Borneo, 14 have their source in the mountainous forests of the HoB (figure 2.5). Rivers provide important values as an input to industry, agriculture and energy generation; they provide clean drinking water; and they are also an important means of transport. These values can

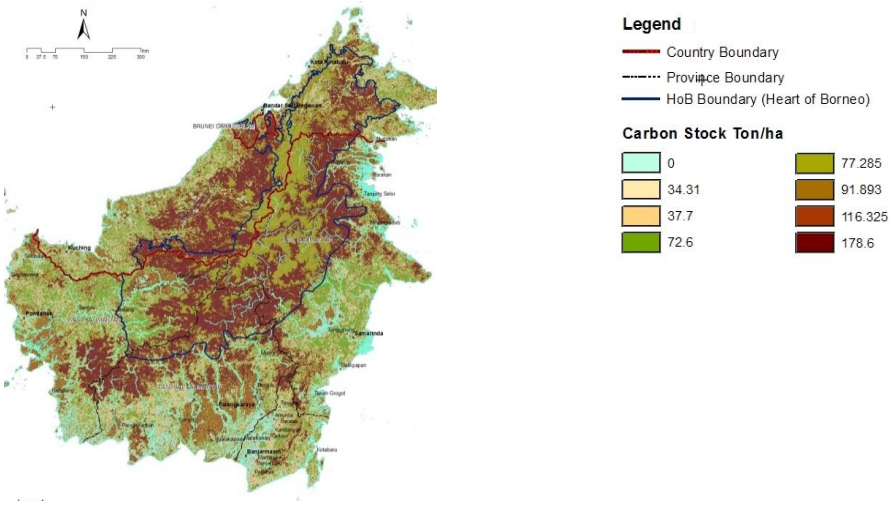
[28] Paoli *et al. Biodiversity Conservation in the REDD,* Carbon Balance and Management 5:7, 2010

[29] Putz *et al., Improved tropical forest management for carbon retention*, PLoS Biology, 2008

however be lost through deforestation and pollution. Maintaining the quality of the watershed forests in HoB will help ensure reliable, clean and safe water supplies to rural and urban populations.

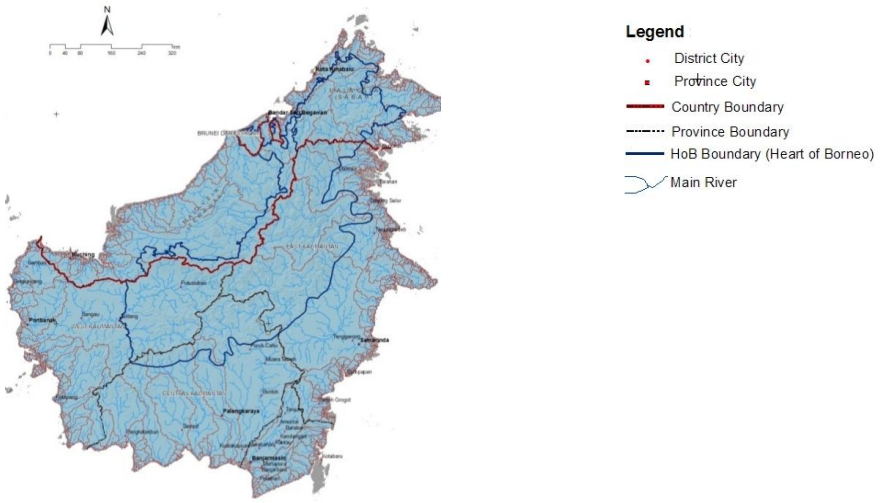
4. Biodiversity – includes the variety of living organisms, their genetic variation, and the variety of different natural communities and ecosystems within an area. Biodiversity provides different types of value through ecosystem services (described in more detail in **Section 1**) which are fundamentally linked to the quality of the natural environment in terms of the level of disturbance and pollution. Deforestation reduces the natural resource value of biodiversity. Figure 2.6 shows a high level indication of the distribution of different levels of high conservation value forests (HCVF) in Kalimantan.
5. Soil – the quality of rainforests soils such as those found in Borneo is naturally maintained by the rapid cycling of nutrients from decaying biomass through to plant uptake and growth. In many areas Borneo's soils typically have a shallow layer of nutrient rich topsoil that relies on the dense vegetation above for its replenishment and to protect it from heavy rains. This together with the steep terrain means that the soils are particularly vulnerable to erosion and quickly lose their nutrient rich upper layers if the forest is removed. As a result the soils are generally considered fairly poor and unsuitable for agriculture. Peat soils, in contrast, are quite deep, however these need to be drained before they are suitable for production. Peat soil drainage increases their susceptibility to erosion and releases large amounts of carbon into the atmosphere, contributing to climate change. The prevalence of poor soils has partly contributed to the spread of palm oil, as a lucrative and fairly resilient crop. Eastern Sabah seems to be the exception with rich soils that are good for agriculture and which give rise to some of the most spectacular forests in Borneo.

Figure 2.4. Carbon storage HC



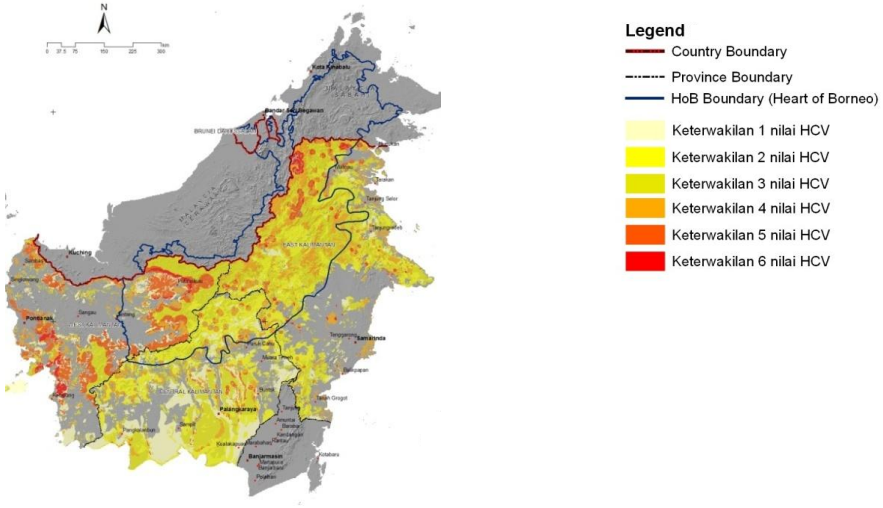
Source: Predictions using Modis Image Satellite 2007 and Statistics Indonesia

Figure 2.5. Watersheds



Source: WWF, DEM SRTM data, 2008

Figure 2.6. HCVF density across Kalimantan



Source: Modis Image Satellite Classifications 2007 and Statistics Indonesia. Data only for Indonesia.

Metals and minerals

Borneo holds metal and mineral natural capital including; tin, copper, gold, silver, coal, diamonds, and different types of sand and stone. For example, Kalimantan holds 53% of Indonesia's 4,300 million tonnes of recoverable coal reserves[30], and Sabah and Sarawak hold 99% of Malaysia's 1,724 billion tonnes of coal deposits[31]. Within the HoB the most significant mining resource is coal in the Kalimantan region, along with some copper, and gold.

[30] Innovation Energy Environment, 2010

[31] Mineral and Geosciences Department, Malaysia, 2010

Social and Physical capital in the Heart of Borneo

Economic development is also dependent on social and physical capital. These capital classes can both support and benefit from green growth, as green economic opportunities rely for example on people and infrastructure but can also support wider national goals such as economic growth, poverty alleviation and energy and food security.

Social Capital in the Heart of Borneo

Borneo has a population of 18.5 million, approximately a quarter of which are located in 10 cities with populations above 200, 000 people. This relatively large workforce is an important asset in developing new green industries. However, there is a lack of skilled workers, particularly in manufacturing and services in Indonesia and Malaysia, resulting in an influx of foreign workers. Additional training will be required in order to take advantage of green economy initiatives requiring particular skills and knowledge (see Section 3).

Government policies on labour and working conditions are also important for attracting both foreign direct investment (FDI) and skilled labour. Brunei ranks 4th in the world for flexible employment laws. However policy reform is needed to improve the attractiveness of developing businesses in both Indonesia and Malaysia which rank poorly in the World Bank Employing Workers Index; 149th and 61st, respectively. FDI is also dependent upon perceptions of a "clean economy". Currently Brunei is ranked 38th, Malaysia 56th and Indonesia 110th in Transparency International's Corruption Perceptions Index.

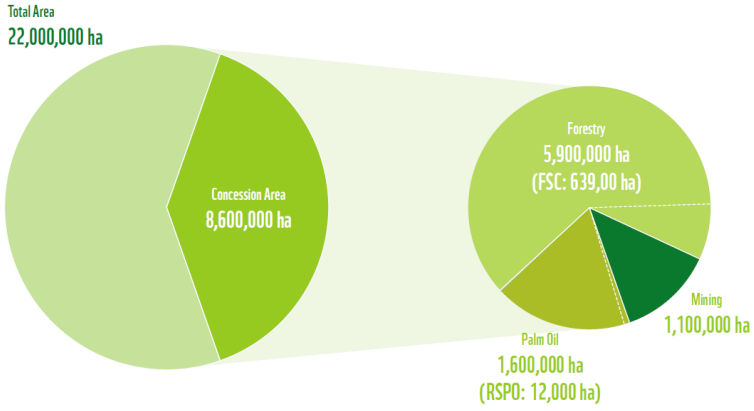
Physical capital in the Heart of Borneo

The physical capital of Borneo varies in terms of state of development (from less developed in Kalimantan to developed in Brunei), though it is generally improving across the region. The road network provides access to the areas of greatest interest, facilitating business development. Good planning, governance and law enforcement across and within borders are important in ensuring the network does not also facilitate illegal logging, encroachment and mining activities. Borneo also has excellent connections to export markets in Asia, Australia and further afield, principally via its numerous ports.

Economic Activity in the Heart of Borneo

Currently economic activity in the HoB is based primarily on the use of natural capital. This natural capital remains largely intact, with forest covering approximately 50% of its area. However, governments have allocated almost 40% of the land area to the forestry, palm oil and mining industries as concessions (figure 2.7). This will have a profound influence on the future value and distribution of natural capital. In order to green economic activity natural capital needs to be valued for its long-term economic, social and ecological benefits. This could further both the governments' conservation agendas and promote sustainable increases in living standards. The merits of these continued agricultural and industrial developments therefore need to be evaluated alongside the projected changes in natural capital (i.e. an analytical framework that accounts not only for economic growth but natural capital, climate change and social development).

Figure 2.7. Area of the Heart of Borneo currently allocated to forestry, palm oil and mining industries

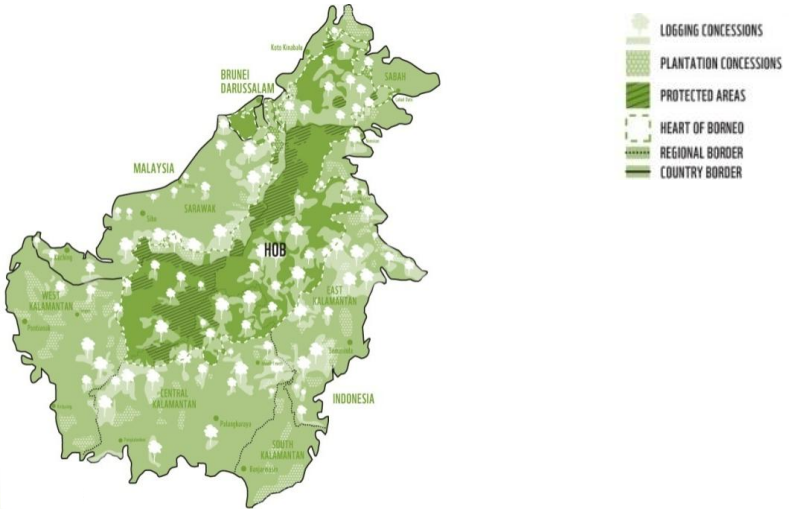


Source: WWF, 2011.

Forestry

The forestry sector manages the most land of any sector operating inside HoB, almost 6 million ha (figure 2/8). Sustainable natural logging poses the greatest opportunity for conserving the natural capital of HoB whilst still generating revenue. However, unsustainable logging and conversion to plantation forestry is also the greatest threat to the natural capital inside HoB. Currently, forestry provides an important revenue stream to Indonesia and Malaysia; in 2008 export revenues totalled USD 6.7 billion[32], and USD 6.8 billion[33], respectively. Furthermore, forestry is an important source of income for rural communities, employing more than 300,000 in Malaysia[34] and 500,000 in Indonesia[35]. However, the lack of skilled workers has resulted in a continuing increase in foreign workers; educating and training local labour would help increase the local industry benefits (see **Section 3**).

Figure 2/8. The distribution of logging and plantations across Borneo and within the HoB



Source: WWF, 2011.

Rapid logging over prolonged periods has resulted in a dramatic fall in the available economic reserves of timber in natural forests and thus production has been in decline in both countries for a number of years (figure 2.9 and 2.10).

[32] FAO Stat, 2010

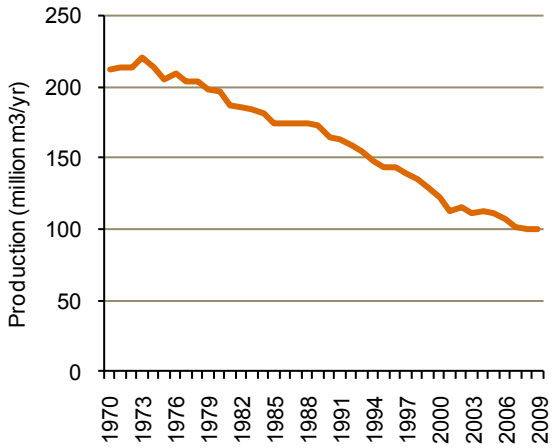
[33] Malaysia's National Timber Industry Policy 2009-2020

[34] Malaysia's National Timber Industry Policy 2009-2020

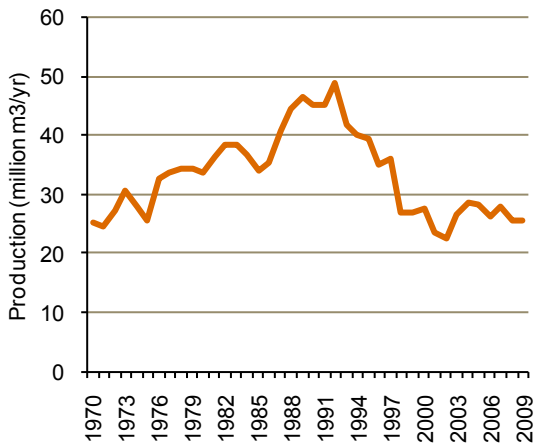
[35] A roadmap for the revitalisation of Indonesia's forest industry, 2007

Figure 2.9 and 2.10: Roundwood[36] production in Indonesia and Malaysia 1970 to 2009

Indonesia



Malaysia



Source: FAOSTAT, 2010

Revenues from the sector have however largely been maintained by diversification into other areas, such as manufactured timber products in Malaysia, and pulp and paper in Indonesia.[37] Both countries plan greater expansion of the forestry and timber products industries. The 'Malaysian National Timber Industry Policy' lays out plans for annual growth of 6.4%, more than doubling revenue to 2020. This is to be achieved by further increases in downstream processing (principally from, flooring, laminated veneer lumber, laminated timber, furniture, and joinery products such as doors, windows and mouldings), such that they represent 60% of the value in the industry, up from 40% today. Indonesia is also looking at downstream industries, but the focus is on timber supply, in particular from the expansion of plantations.[38]

These expansion plans need to be carefully considered alongside the governments' vision for the HoB. In particular, how the allocation of forestry concessions inside the HoB is expected to contribute to economic growth, and the consequences of this for the value and distribution of natural capital. It will be important to ascertain what proportion of the 6 million ha is currently active or inactive, and what the expected revenue streams from these are.

Sustainable forest management and reduced impact logging (RIL) can help ensure the appropriate balance is struck between the use of forestry resources and the maintenance of other types of natural capital. Moreover, sustainable forest management helps ensure the forests provide a long term source of revenue, avoiding the declines seen in figures 2.9 and 2.10 above.

Amongst the states of the HoB, Sabah is currently leading the way on sustainable forest management. Following the decline in available natural timber resources, and growing environmental concerns, Sabah Forest Department has mandated that all forest management units must be independently certified by 2014, for example through the FSC. In addition, the state has imposed more stringent limits on the annual allowable cut and enlisted an independent firm to monitor all natural forest management areas under the Reduced Impact Logging Approach. There are currently over 270,000 ha of sustainably managed logging concessions (FSC or MTCC certified) within the Sabah region of the HoB, with the balance of 1.5 million ha within this area aiming to meet the challenging 2014 timetable for certification. As a result of these moves towards sustainable production levels, annual log production from natural forests is likely to decline moderately in the near term

[36] Roundwood is wood in its natural state as felled, or otherwise harvested, commodities included are sawlogs and veneer logs, pulpwood, other industrial roundwood (including pitprops) and fuelwood. Illegal production may not be fully recognised in these figures

[37] Principally from Sumatra, although the Indonesian Roadmap for Forest Industry Revitalisation envisages greater developments in Kalimantan.

[38] A Roadmap for the Revitalisation of Indonesia's Forest Industry, 2007

but, if the aims of the programme are met, continuing production should be sustainable and continue to deliver value to government, companies and communities over the long term.[39]

Palm Oil

Palm oil production in Borneo in 2008 was 16.5 million tonnes (table 2.2), representing more than a third of Indonesia's and Malaysia's combined production, which together produce more than 85% of the global palm oil supply[40]. Since 2000 the total planted area in Borneo has increased by around 5% per year in Malaysia[41] and by 9% per year in Indonesia[42] reaching 3.6 million ha in 2008.

Table 2.2. Crude palm oil production in Borneo, by state

	Production (tonnes)			Area (ha)
State[43]	**2006**	**2007**	**2008**	**2008**
West Kalimantan	557,000	520,000	523,000	410,000
Central Kalimantan	6,300,000	6,400,000	6,400,000	712,000
East Kalimantan	1,400,000	2,000,000	1,700,000	410,000
South Kalimantan	360,000	430,000	435,000	190,000
Sarawak	1,500,000	1,600,000	1,800,000	740,000
Sabah	5,400,000	5,600,000	5,700,000	1,200,000
Total	15,517,000	16,550,000	16,558,000	3,662,000

Source: BPS Kalimantan, 2009; MPOB, Statistics on Commodities, 2009; Department of Agricultural Sarawak, 2009

Palm oil is a significant source of foreign exchange for the region, generating export revenues of USD 12.4 billion[44] in Indonesia and USD 14 billion[45] in Malaysia. Palm oil also provides a significant source of employment for many of Indonesia's and Malaysia's rural poor employing more than 3 million in Indonesia[46] and 1.5 million in Malaysia[47].

Both Indonesia and Malaysia are increasing their total planted areas. For example, Malaysia's 10MP identifies palm oil as a National Key Economic Area, and the Third Industrial Master Plan seeks to have 2.7 million ha planted by 2020, an increase of 800,000 ha from 2008. More ambitious still, the Sarawak State aims to have 2 million ha of plantations by 2015, an increase of 1.3 million from 2008.[48] This growth is expected to be outside of HoB, as Sarawak currently has no concessions for palm oil plantations inside the HoB. On the other hand, new palm oil concessions in Kalimantan, particularly West Kalimantan, have been allocated inside the HoB boundaries. There are 1,600,000 ha of concessions inside the HoB; 770,000 ha of active concessions in Sabah,[49] and 830,000 ha of active and newly allocated concessions in Kalimantan[50].

Increasing production from new plantations inside the HoB will impact the value of natural capital. Palm oil plantations require the complete conversion of land, which, if replacing primary forests, results in a significant loss in natural capital. Lower impact palm oil production, such as RSPO, can reduce the loss of natural capital yet still allow for palm oil expansion, whilst other economic uses of the land are also possible (see below). Other important ways in which the palm oil industry can increase revenues and value added without increasing

[39] National Timber Industry Policy 2009-2020

[40] Oil Palm Industry Economic Journal, 2003

[41] MPOB, 2009

[42] Indonesian Commercial Newsletter, November 2009

[43] BPS Kalimantan, 2009; MPOB, Statistics on Commodities, 2009; Department of Agricultural Sarawak, 2009

[44] Hatta Rajasa, Indonesia's Coordinating Minister for the Economy, interviewed in Bali, 2009

[45] MPOB, Statistics on Commodities, 2009

[46] World Bank, 2010

[47] East Coast Economic Region Development Council, *2010*

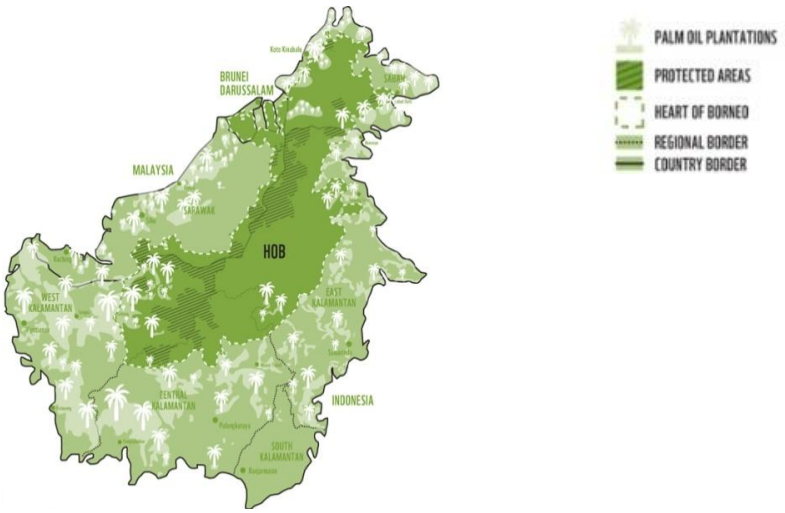
[48] Land Development Minister Dr James Masing, 2007

[49] MPOB, 2009; plantation considered to be inside HoB if it lies within one of the 16 districts within the Sabah HoB region.

[50] Ministry of Agriculture and Agriculture Agency (District/Kabupaten level) and WWF Palm Oil company field Survey, 2008

pressure on HoB forests is through improved yield and greater development of downstream processing. Decisions to convert forest to palm oil should be based on modelling of economic, environmental and social impacts in both the short and long term to help ascertain to what extent continued expansion will contribute towards the long term prosperity of the region.

Figure 2.11. The distribution of palm oil across Borneo and within the HoB



Source: WWF, 2011

Mining

Coal

Amongst the mining sub-sectors, coal mining is the most prevalent. Annual coal production in Indonesia has grown rapidly in the last decade to over 250 million tonnes. This figure is forecast to continue to grow by 4-6% per annum, reaching 316 million tonnes in 2014.[51] Much of this growth is expected to come from Kalimantan, which holds 53% of Indonesia's 4,300 million tonnes of recoverable coal reserves.[52] Some of these reserves are within HoB, indeed there are already signs of activity, with more than 1,100,000 ha of coal concessions within HoB (figure 2.12).[53]

The Malaysian coal industry is almost wholly based in Sarawak. In contrast to Indonesia, it is relatively undeveloped producing a little over 1 million tonnes per annum which supplies 6 power plants.[54] However, the Department of Minerals and Geology estimates that Malaysia holds reserves of 1,724 billion tonnes with the vast majority of these in Sarawak (80%) and Sabah (19%).[55] Some of these reserves are located in environmentally sensitive areas inside HoB, for example the Maliau Basin (a World Heritage Site) and Danum Valley forest reserves in Sabah are both thought to sit above significant deposits.

Brunei has coal reserves, some of which all lie underneath high conservation value forest (e.g., Sg Ingei conservation area). Some surveys are under way but the government has not made any decision to exploit these reserves.

[51] Business Monitor International, Indonesia Mining report Q3, 2010

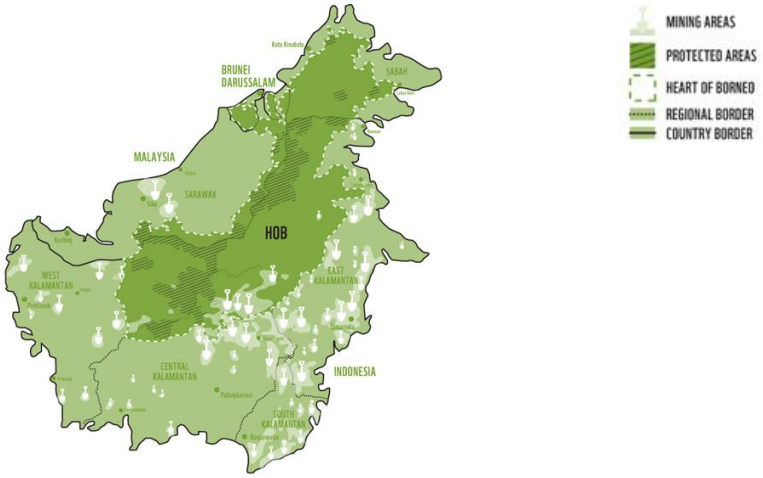
[52] Innovation Energy Environment, 2010

[53] Indonesian Ministry of Energy and Mineral Resources, 2008.

[54] Malaysian Mining Industry Report 2008

[55] Mineral and Geosciences Department, Malaysia, 2010

Figure 2.12. The distribution of mining across Borneo and within the HoB



Source: WWF, 2011

Coal exports are an important source of foreign exchange for Indonesia, generating revenues of USD 7.7 billion in the first 4 months of 2010 alone.[56] The industry has also been an important contributor to economic growth, representing 4.5% of national GDP in 2009. In Kalimantan coal represents more than 7% of the local GDP.[57]

Malaysia's national consumption has undergone a rapid increase over the last decade, driven by increases in the proportion of coal in the fuel mix, which has replaced more expensive natural gas, and is now up to nearly 40%.[58] Given Malaysia's current low domestic production, this is sustained by imports, principally from Indonesia, Australia, and China. Theses imports have a significant cost of more than USD 1.6 billion per annum.[59] The potential for relatively low cost energy generation, increased export revenues in Indonesia, and reduced import costs in Malaysia, are motivating both governments to seek greater exploitation of their coal deposits in Borneo.

Of the 1,100,000 ha of coal concessions within the Kalimantan region of HoB (figure 2.12), most, 980,000 ha, are in the research or exploration phase.[60] There are no confirmed mining concessions within the Malaysian part of the HoB. However, the Tenth Malaysian Plan sets out plans to reduce the cost of coal imports and increase regional energy security. The plans include the construction of two new coal power plants, one in Lahad Datu, Sabah, and one in Peninsula Malaysia, together with the associated mining infrastructure to meet their capacity.

These plans will need to be carefully evaluated for their compatibility with parallel objectives of the Declaration. Decisions to extract natural capital, such as minerals and fossil fuels, may require a trade-off with other types of natural capital, such as forests, watersheds and biodiversity. The allocation of concessions and the operations of mining companies therefore need to consider the optimal use of these resources through time and across different geographical regions. For example, in Sabah the state government has made the decision to refrain from developing the coal resources within the Maliau basin, declaring it a Class 1 Protected area. Former Sabah Chief Minister Datuk Yong noted that "under conservation, with research, education and technological progress, we can benefit from the monkeys, the wildlife and the ecosystems and biodiversity."[61]

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[56] http://theindonesiatoday.com/stock-headline/1292.html

[57] BPS Kalimantan Tengah Dalam Angka, 2009

[58] COGEN3, Malaysian National Energy Review, 2003.

[59] http://malaysianminerals.com/minerals-statistics.html

[60] Indonesian Ministry of Energy and Mineral Resources, 2008.

[61] Former Sabah Chief Minister Datuk Yong Teck Lee speaking at the Rotary Club of Kota Kinabalu, July 2000, www.sabah.org.my

Gold and Copper

In 2007, reported Malaysian gold production was 3,497 kg a decrease of almost 20%, but there was no large scale commercial gold production in Sabah or Sarawak. The Department of Minerals and Geoscience in Malaysia has, however, acknowledged the potential, particularly in Bau, south-west Sarawak, where small-scale miners have been operating since the nineteenth century.

Small-scale gold mining in Kalimantan is more widespread than in Sabah and Sarawak, particularly because alluvial deposits are more common. Small scale gold mining operations often operate without a licence and use illegal techniques, such as the use of mercury to extract gold. Mercury is a highly poisonous metal which is persistent in the food chain; the contamination of watercourses results in significant social and health impacts, as well as causing environmental damage.

Large scale gold mining in Kalimantan has been in decline, most notably since the closure of Rio Tinto's Kelian gold and silver mine in East Kalimantan in 2003, which had produced almost 15 tonnes of gold and silver per year. There remains interest however in the potential for future production. For example, the village of Muara Asa in East Kalimantan is reported to hold total gold ore deposits of 300 million tonnes, yielding 400mg of gold per tonne of ore. In addition, Waringin, Central Kalimantan, is estimated to hold over 140 million tonnes of ore.[62]

Gold deposits often coincide with copper and future investment is being made on this basis; the Kalimantan Gold Corporation announced in late 2009 that it will issue additional shares to finance continuing exploration of copper and gold deposits in the south east of the HoB in Central Kalimantan, as well as outside the HoB boundary, near Malinau, in East Kalimantan.[63]

While the historical impacts of large scale gold mining in Borneo appear to have been relatively limited, new exploration in Kalimantan, interest in Sarawak, and on-going illegal activity, coupled with current record gold prices, could undermine effort to deliver the commitments in the Declaration. The authorities will need to be mindful of potential negative impacts of gold mining from both existing small scale and new large scale operations.

Diamonds

Mining for diamonds is carried out in Kalimantan and Sarawak, principally by small scale alluvial miners. Reports suggest that while some of these have permits, many are illegal. There is also a major diamond mine in South Kalimantan (outside of the HoB), owned by PT Galuh Cempaka. According to the company website, it is estimated to hold 2.6 million carats within a 44.3 million cubic meter gravel bank. The presence of diamond deposits elsewhere in the HoB is a potential risk to the Declaration if mining is undertaken in an unsustainable way, but a present there do not appear to be significant plans to develop these at scale. Authorities may wish to focus on regulating small scale activity.

Eco-tourism

The economy of the HoB is not entirely based on the extractive industries. The unique and wild beauty of Borneo's forests and coastlines draw tourists from all over the world. In 2009, Sabah alone recorded more than 2 million arrivals, generating an estimated USD 1.2 billion in tourism receipts.[64] These tourist revenues are largely contingent on the continuing quality of the natural environment. Decisions as to the future land use of the HoB therefore need to consider how changes in land use will affect the natural environment, and what effect this might have on eco tourism revenues.

Leaders of the Brunei Darussalam, Indonesia, Malaysia and the Philippines–East ASEAN Growth Areas (BIMP-EAGA) have agreed to bolster the area as potential eco-tourism haven in Asia. The governments of the region have recognised the importance of community-based ecotourism to the economic development in rural areas. Ecotourism is also considered a strategic priority to support protection of natural resources in the HoB.

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[62] Business Monitor International, Indonesia Mining report Q3 2010

[63] http://www.kalimantan.com/i/pdf/KLG-Admission-Doc.pdf

[64] Sabah Tourism Board, 2010

Realising the Green Economy Opportunity in the Heart of Borneo; Critical Success Factors

To date HoB has been primarily conceived of as an opportunity to achieve conservation goals and as an area rich in natural capital that can be extracted, often in a way that degrades or depletes the natural capital assets. Yet wider national priorities for economic growth, poverty alleviation and energy and food security could benefit from green economic activity in the HoB, at the same time helping to achieve the aims of the Declaration. To succeed in the five dimensions of green growth it is important to address the critical factors in the context of the HoB, namely policy, skills and knowledge, analysis and evidence, collaboration and finance. Social and physical capital are also important components of economic success and compliment the green economy critical success factors.

Figure 2.13: Green growth critical success factors

Source PwC and WWF

A brief overview of progress in addressing the five dimensions of green growth is included below.

Policy

The governments of Borneo have developed a range of policies and plans for the HoB, but also for related issues such as climate change, renewable energy and forestry at a national level. The table below considers to what extent a selection of these policies and plans address the five 'dimensions' of green growth (see figure 1.1).

Table 2.3: Heart of Borneo Green Economy Policy Review

Document	Economic Growth	Greenhouse Gas Reduction	Climate Change Resilience	Biodiversity and Ecosystem Services	Social Development and Poverty Alleviation
Strategic Action Plan for HoB – Sabah regional government	×	×	×	✓	×
Strategic Action Plan for HoB – Ministry of Forestry, Indonesia	×	×	×	✓	×
Strategic Action Plan for HoB – Government of Indonesia	✓	✓	×	✓	✓
HoB Project Implementation Framework – Sarawak Regional Government	×	×	×	✓	✓
HoB Project Implementation Framework – Brunei Ministry of Industry and Primary Resources	✓ Advocates "economic diversification" especially eco-tourism	× Incidental references	× Brief mention of water management to avoid impacts of climate change	✓	×✓ Raising rural incomes as part of conservation

Strategic Plan of Actions of the Heart of Borneo Initiative –Governments of Indonesia, Malaysia and Brunei	×	×	×	✓	×
Sarawak Corridor of Renewable Energy	✓ Fairly detailed but potentially unrealistic plans for economic development in the region	✓ Power expansion hydro-based	×	×	×
Strategic Action Plan for HoB – Government of Indonesia	✓	✓	×	✓	✓
Central Kalimantan Low-emission Growth Strategy	✓	✓	×	× Contains brief mention of monetising ecosystem services	×
East Kalimantan Low-emission Growth Strategy	✓	✓	×	× Strong advocacy of REDD+ but incidental to ecosystem protection	×
National Action Plan To Tackle Climate Change – Government of Indonesia	×	✓	✓	×✓ Role of forests in protecting communities from climate change	×
Annual Report 2009 – Sabah Forestry Department	×✓ Discusses ways to increase value created by forestry industry	×	×	✓	×

The key findings from this high level HoB green economy policy review are threefold:

1. There is a good understanding of the challenges to and a high level consensus about the vision for greener future in the region but there is a lack of detail about what needs to be done, how, when and by whom (i.e. implementation);
2. There is no single document, or organising framework, that takes account of the multiple dimensions of green growth and provides an overview of how different government policies relate to the HoB; and
3. There is political backing for the HoB but this does not appear to be embedded across different Ministries in HoB governments.

The findings from the review also mirror to an extent the views of business as revealed through the WWF "Business Solutions in the Heart of Borneo report". For example, with respect to land allocation, businesses thought that "Central and local government need to clarify and harmonise spatial plans and the guidelines for land allocation". Similarly, with respect to Environmental Impact Assessments it was found that "Regulators need to provide clearer guidance, and enforce it more effectively to incentivise companies to produce detailed EIAs."

It is not just policy development that is important but also the ability to deliver policy. This requires capacity on the ground, consisting not just of public officials but also businesses and non-governmental organisations. Successful delivery depends on skills and knowledge, for example in sustainable resource use, project management, engineering etc and also on the ability to tackle problems such as illegal activity, lack of understanding (of policies by stakeholders) and corruption. Whilst some of these problems can be tackled through specific initiatives, e.g. enforcement officers and certification systems for the illegal timber trade, others are more systemic, e.g. corruption, and cannot be addressed solely through work on the green economy. The Asian Development Bank has highlighted such weaknesses in governance and institutions in Indonesia, "especially in the prevalence of corruption [and] poor government effectiveness"[65] and has advocated "removing inconsistencies between national and regional laws [and] clarifying roles". Improving the three countries' position in Transparency International's Corruption Index and other similar measures will be important for attracting FDI and for improving the success in delivering green economy policies.

Analysis and Evidence

The HoB green economy policy review highlights that current government policies do acknowledge the need for all aspects of the green economy. However, the review also highlighted concerns about the siloed and sometimes conflicting nature of the range of different policies. This may result from differences in the institutional landscape but also from the use of different analytical frameworks and evidence. For example, one technique which has been widely applied to climate change, including in HoB countries, is the use of Marginal Abatement Costs Curves (MACCs).[66] These present a snapshot in time of the potential for different mitigation techniques to deliver carbon emission reductions and at what per unit cost. MACCs are a useful tool for estimating the costs of carbon emissions reductions, although they can oversimplify costs because they do not consider wider green economic and social issues. To allow strategic decision making that is sensitive to the local context MACCs need to be combined with economic growth models and assessments of natural capital and social development.

A robust analysis upon which to base policies targeting a transition to a green economy should consider questions, such as:

- What are the dependencies between different types of natural capital and economic growth?
- What is the relationship between different economic sectors and social development?
- What are the non-market values of natural capital to different social groups? How does extraction or use impact these values and thus social development?
- What opportunities are there for economic diversification to less natural resource intensive sectors or non-extractive use?
- How can the value added by each economic sector be maximised to reduce the pressure on resource extraction?
- What are the implications of different policies and practices on long term economic growth, environmental quality and social development?
- If a set of policies and practices are implemented to ensure environmental quality is maintained what are the short, medium and long term economic costs? Are there long term benefits?

These and other questions about economic, social and environmental conditions should be considered in an analytical framework that draws out trade-offs and synergies to show the impact of different development pathways.

Finance

The transition to a green economy in the HoB will require substantial finance. The exact finance needs will depend on the chosen interventions highlighted through the analysis and evidence generation, but are likely to run into hundreds of millions of US dollars. Some indicative costings for green economic activities are provided in Section 3, however further work is required to develop costs for both demonstration and scaling up projects, including potential revenue. The recent government report 'Financing the Heart of Borneo' sets out options for funding sources, including licensing and royalty fees, special funds, direct and indirect subsidies and debt-for-

[65] Indonesia: Critical Development Constraints (Asian Development Bank, 2010).

[66] In particular these have been used in studies for East and West Kalimantan.

nature swaps and work is ongoing to develop funding flows. For example, The Indonesian HoB National Working Group has now formed a Sustainable Finance Team to explore and develop potential sources and mechanisms. Table 2.4gives an initial canvassing of these potential sources of financial support that could be used to advance the HoB vision.

Table 2.4: Potential sources of financial support

Government	Licensing and Royalty Fees
	Special Funds
	Direct and indirect subsidies
	Debt-for-nature swaps
Market	Water catchment service payments
	Carbon financing
	Mitigation banking and biodiversity offset payments
	Tourism payments, fees and taxes
	Bioprospecting
	Sustainable Capital
Donors	Corporate donors and corporate social responsibility (CSR)
	Philanthropic foundations and NGOs
	Individuals
	In-situ ex-situ conservation partnerships

Source: WWF, 2010, Financing the Heart of Borneo

Analysis is needed to determine the exact potential for finance from these sources. National and international finance provides a key mechanism to integrate the value of natural capital in the HoB into development plans. For example, debt-for-nature swaps provide a direct incentive for governments to enforce conservation laws, in order to realise the fiscal benefits. Similarly, international finance will dominate the private sector's decision making processes. Carbon finance and biodiversity offset funds, among others, will provide the necessary incentives to avoid otherwise profitable deforestation and habitat destruction. In short, acquiring sustainable finance is essential to provide tangible value to natural capital in the HoB and therefore to realise the potential of the tri-lateral Declaration. However to secure funds from donors and investors, mechanisms are required for managing finance in a transparent way that provides confidence in results (see Section 3). In the long-term it will be necessary to develop multiple channels of finance, not just international donor support. Governments will need to show willingness to pay for activities which generate socio-economic benefits, whilst investors will want returns from profitable enterprises.

Collaboration

The need for collaboration ties in closely with finance (above) and skills and knowledge (below). The HoB governments have engaged with numerous stakeholders over the years since the initiative was first conceived, although there is no permanent stakeholder engagement mechanism. Whilst there is significant awareness of, and interest in, the initiative already amongst those stakeholders that have been actively engaged to date, others, especially in the private sector have shown much less awareness of the initiative, and are unsure as to how the HoB initiative should influence the way they operate on the ground.

As a key partner of the three governments, WWF have already undertaken a considerable amount of stakeholder engagement regarding the HoB in recent years. As part of the development of this scoping study (and the associated sector-based studies) PwC have taken the opportunity to meet and canvas a range of potential key stakeholders for their views on the HoB in general and the scoping study in particular. These have included (but not been limited to) organisations such as:

- Government bodies (e.g. Indonesian Ministry of Forestry and Coordinating Ministry of Economic Affairs)
- Sovereign wealth funds (e.g. Khazanah)
- Funding bodies & international donors (ADB, IFC, DFID, UNEP)
- Private sector (RSPO, Sime Darby, HSBC, Shell)
- NGOs (via WWF)

From the stakeholder soundings taken during this scoping study, it was found that regardless of the level of awareness of the initiative there is a genuine interest in opportunities presented for a green economy. Experience of other relevant stakeholder engagements in the region have also shown the importance of having stakeholders engaged in developing rather than just delivering the HoB vision, and this will need to be considered when deciding what interventions are needed to ensure progress.

International, Business and NGO support

The stakeholder interest canvassed as part of the scoping study reflects formal international offers of support for action to tackle climate change and protect biodiversity in the HoB. For example, President Obama recently highlighted the HoB as one of their specific initiatives to be covered under the US-Indonesia Comprehensive Partnership. The US is providing debt alleviation for forest conservation through their Tropical Forest Conservation agreement with Indonesia, and Norway has signed an agreement to provide USD 1 billion for reduced emissions from avoided deforestation. Multilateral institutions have also recognised its importance, for example, the Asian Development Bank (ADB) is actively involved through capacity building and a USD 1.5 million grant for environmental programmes in the region.[67] In addition, the World Bank's Global Environment Facility (GEF) is providing support to several biodiversity, climate change, and sustainable development projects across Indonesia and Malaysia.

Some businesses are showing a strong interest in opportunities for green economic activity in the HoB. Recent engagement with representatives from more than 80 companies from the forestry and palm oil industries operating inside the HoB highlighted the business importance of sustainable management and production techniques. More than 60% of palm oil companies and 82% of forestry companies saw sustainable management as part of good environmental risk management. In addition, 65% of forestry companies indicated that it was important for securing the long term profitability of their company; and 50% of the palm oil companies thought sustainable practices could improve their image with the public and consumers. However, fully 46% of companies spoken to were not previously aware of the Declaration, indicating that there is still a considerable amount of work to be done to get the involvement of local businesses that will be essential for the success of the Declaration. Only 8% of businesses were managing their production to a standard which meets international certification of good management practices (FSC / RSPO).

Non-governmental organisations are key to helping involve local businesses and communities in sustainable land-use and conservation in a green economy. International NGO's continue to support conservation and development goals, increasingly realising synergies with the governments and businesses. The WWF 'Business Solutions' report encourages businesses to engage in the goals of the Declaration and offers them support in finding successful economic opportunities through sustainable use. In addition, local NGO's are having an important impact, such as Yayasan Tambuhak Sinta who currently work with government, other NGOs and donor agencies to develop and implement 'economic livelihood groups' in 50 villages in the district of Gunung Mas, Kalimantan. Economic livelihood groups explore new sustainable revenue opportunities for communities, aiming to move away from illegal mining and forestry activities.

Skills & Knowledge

In their trilateral Strategic Plan of Action the three governments specifically acknowledge the need for capacity building to support the Declaration. The transition towards a green economy requires new skills and knowledge and as a result the labour force will need education and training. Skills and knowledge are needed in a range of sectors, many of which are highly technical, such as engineering, ecology, science, economics and technology. This does not always require workers to be completely retrained however. A recent EU publication highlights that workers can easily adapt existing skills for a green economy. For example, workers in the oil industry often have skills relevant to the wind-turbine industry.[68] Similarly, forest managers can easily adapt to a restoration, conservation and protection-based role.

The exact knowledge and skills needs in HoB will depend on the choice of policies and practices. To date there has been a demand for expertise in sustainable forest management and eco-tourism, some of which has been

[67] http://www.adb.org/media/Articles/2008/12420-asian-environmental-projects/

[68] *Skills for Green Jobs European Synthesis Report* European Centre for the Development of Vocational Training and International Labour Office

met with foreign labour. If governments want to benefit from wider green economy land use related opportunities then knowledge and skills in other areas such as REDD+ will be needed, for example in monitoring, reporting and verification (MRV) of forest carbon emissions, in forest carbon policy development and in carbon finance. Modelling of policy choices, combined with stakeholder engagement and demonstration projects will help determine the most beneficial economic activities and thus the skills and knowledge needed. Support in skills transfer and development of training programmes will help facilitate the structural adjustment of the labour force and minimise the social cost incurred as a result of the skills mismatch (see **Section 3**).

Conclusion

The combination of political support both domestically and internationally, business and NGO interest and the rich natural capital that exists in the HoB presents an opportunity for green growth as a vehicle to achieve the Declaration and wider government policy aims. To realise this potential the critical success factors need to be addressed. Some progress has been made in this regard but more needs to be done. **Sections 3-5** set out an integrated approach to green growth that could be used to support such progress. An initial set of recommendations are also presented to specifically address the green economy critical success factors above and ultimate to support the Declaration and wider national priorities.

Section 3: Towards a Green Economy in HoB – An integrated approach

Section 3: Towards a Green Economy in HoB – An integrated approach

Introduction: an integrated approach to green growth

Our analysis has highlighted a series of critical success factors for the green economy and the opportunity for green growth in the HoB. This section sets out recommendations for addressing the critical success factors in order to seize the green economy opportunity in the HoB and secure progress against the Declaration and wider government priorities. We recommend an integrated approach to green growth, which we have called the Green Growth Generator – a six stage process of stakeholder rich visioning, evidence based analysis and decision-making, that results in a Roadmap and implementation plan. The Generator is explained in Section 3 and is followed by **five recommendations** for how to progress green economic growth. A key element of the suggested approach is the need for demonstration and scaling up projects ('quick wins') to produce action on the ground and provide evidence to feed into the Generator. A number of suggestions are provided for specific demonstration and scaling up projects and we recommend these and the other four recommendations be further developed in consultation with interested stakeholders.

Recommendations for specific policy change are not included. Whilst these are considered a critical success factor they are an output of the Green Growth Generator process; a result of gathering baseline evidence, engaging stakeholders, in particular the government, and analysing interventions. By seeking to address the goals of the Declaration and seize the green economy opportunity through an integrated process it should be easier to understand the trade-offs and synergies between policies and practices. Pursuing individual opportunities in isolation risks unintended consequences with sub-optimal results and stakeholder alienation. Adopting an integrated approach is also likely to address the concerns of businesses and investors as well as the international community that governments in the region are committed to green economic transformation.

The Green Growth Generator

The Green Growth Generator is a decision support tool which could be developed with one or more of the HoB governments to help drive the formation of policies and identification of practices which deliver economic, social and environmental outcomes. The stages of the Generator are set out in table 3.1 and include the logical progression from visioning (i.e. how to integrate the Declaration with wider government priorities), to establishing the baseline or business as usual scenario and alternative scenarios, through to the economic analysis of these options. The objective of the analysis is to first demonstrate the viability of economic transformation, and then to discuss with stakeholders the combination of interventions thought to be most appropriate. The chosen interventions will be set out in a 'Roadmap'. Finally the options for implementation need to be assessed and undertaken. These stages are detailed below.

The generator process can be applied at a national level encompassing all regions and sectors in a country. Alternatively it can be applied to selected regions (e.g. a province or town) or to specific sectors (e.g. transport, agriculture, oil and gas). The exact focus will depend on the vision of the governing body and the level of development of green growth strategies. For example, if a country already had a green growth or low carbon plan then the Generator can be used at a sub-national level within the existing national framework, or used to add other dimensions of green growth to a national plan, for example if the current plan only focuses on carbon and not natural capital more widely.

Table 3.1. The Green Growth Generator

Stages	1 Vision	2 Baseline Assessment and BAU Scenario	3 Green Growth Scenarios and Interventions	4 Modelling and Analysis	5 Roadmap	6 Implementation
Objectives	**Vision led approach** • Confirm understanding of national / regional development plans / strategies and timeframes • Identify national/ regional / local leaders • Identify stakeholder needs and aspirations **Agree target outcomes**	**Define the baseline and BAU scenario** Establish reference scenarios for the "As Is" baseline position and the business as usual scenario for HoB in the near, medium and long term, considering the 5 dimensions of Green Growth : 1. Economy - drivers of competitiveness 2. GHG emissions 3. Climate change adaptation 4. Value of ecosystem services 5. Social development **Sectoral and spatial analysis of economic and environmental value being created, and implications for social development.**	**Identify potential interventions in different alternative scenarios** Identify & quantify policy & technology options for: 1.Growth of the green economy 2.Limiting GHG emissions 3.Adapting to climate change 4.Maximising ecosystem services 5.Enhancing social equity Including identification of barriers & solutions **Build capacity of national team to generate options**	**Apply robust quantitative analysis to express the implications of different policy and intervention options indentified in scenarios** • Build analytical capacity of national team • Consider interventions costs and benefits in terms of macro and micro economic terms, environmental value , and social development **Understand the effectiveness, efficiency & equity of policy and technology options generated**	**To produce an integrated Roadmap for:** 1. Green markets, jobs , GDP 2. Low carbon development 3. Climate resilient development 4. Maximising ecosystem service supply and value 5. Poverty alleviation Build capacity for strategic planning **Interventions for each sector by stakeholder actors with timescale**	**To support the transition from strategy to change** • Build the capacity to Deliver • Transfer knowledge and skills • Secure finance • Public-private partnerships **Support the transition to a green economy in the HoB**
Key Activites	**Define vision in economic, environmental and social terms** • Stakeholder engagement • Agree definitions and capacity building techniques • Agree understanding of development plan s and strategies • Identify Guiding Principles and Enabling Imperatives (how you will achieve the vision).	**Establish baseline calculation methodology (economic, land-use, social)** • Calculate current and implications for future BAU scenario based on development plans • Land-use mapping with economic, environmental and social implications into future (use InVEST or similar) • Desk based research & analysis supplemented by consultation to capture local and specialist knowledge • Identify key risks of BAU	**Work with national team to develop options generation methodology** • Stakeholder engagement (surveys, workshops, interviews) • Desk based research • Data collection & organisation • Quantitative and qualitative description of options in economic, environmental and social terms • Land-use mapping of different scenarios and interventions Identify key catalytic interventions Assessment framework / prioritisation of interventions (criteria for testing proposals)	**Run scenarios through model** • Macro to micro modelling of scenarios • Link land-use maps to model showing linkages and interactions in economic, environmental and social terms • Cost benefit of individual interventions (including MACC analysis where appropriate) • Qualitative assessment of social factors external to model • Analysis of climate change scenarios with implications for adaptation (quantitative and qualitative) • Equity analysis • Governance analysis	**Work with national team to develop methodology for strategic plan (training-refining)** • Synthesis • Stakeholder engagement to build support for results and understand their preferences (e.g. for risk/certainty, public/private)	**Demand driven support, for example:** • Centre of Excellence • Training programmes • Demonstration projects • Partnerships forums • Design and management of green growth fund • Secondments • Track the transition and measure success
Outputs	• Build and agree the vision • Shared understanding of development plan	1. Valuation of green economy 2. National emissions inventory 3. Climate projections with vulnerabilities 4. Valuation of ecosystems services 5. Social demographics	• Consultations responses • Databases • Identification of key green growth interventions – policy and projects • Potential scenarios to test in model	• Economic, environmental and social models and CBA • Optimal intervention solutions • Assessment of equity and adaptation implications	Roadmap including: • Strategic plan • Economic plan • Stakeholder engagement process	1. Economic growth 2. Limited carbon emissions 3. Resilient economy 4. Environmental value 5. Social prosperity
	Start with existing visioning and development plans	Build strong understanding of current situation using local knowledge and global data	Highly participatory stakeholder engagement to generate locally relevant options	Modelling and analysis provides quantitative & qualitative options & inter-linkages assessment	Roadmap sets clear path for future	Moving from plan to action

Source PwC

Vision

The governments' vision for economic growth, conservation, resource use and greater social welfare in the HoB is the starting point of the proposed Green Growth Generator. The analytical approach is led by this vision, expressing it in economic terms to identify the targeted outcomes of green growth in the HoB.

As section 2 noted there is a good high level understanding of what the principles and objectives of the HoB vision are and the challenges involved in achieving them, however there is a lack of detail about what needs to be done when and by whom. The objectives of this first stage of the analysis is therefore to confirm understanding of national and regional development plans and strategies, mapping these to express the vision in economic, environmental and social terms for the HoB. In addition, this process will identify key stakeholder goals and agree target outcomes of green economic growth in the near, short and long term.

OUTCOME: a clear vision for the future based on the five dimensions of green growth

Baseline Assessment and Scenarios

Before the relative benefits of different interventions can be assessed, the baseline against which they will be judged must first be defined. The baseline represents the 'as is' or business as usual (BAU) scenario, illustrating the predicted path for economic growth, environmental quality, and social development in the absence of interventions or policy changes.

In the BAU scenario, each economic sector will be considered independently and in the context of the other sectors. Which sectors are to be considered will depend on the vision and the current make up of the economy but are likely to include forestry, agriculture, mining, oil & gas, manufacturing, energy & utilities, transport & infrastructure, tourism, education, health, ICT and professional services. Within each sector, the analysis will be based on the five dimensions of green growth (economic growth, limiting GHG emissions, climate change resilience, biodiversity and ecosystem services, social development). The details of the BAU scenario will be populated at macro-economic, micro-economic and spatial levels. In doing so, the scenario will provide a holistic picture of how the effects of different activities filter down to localised effects, for example on the supply and value of ecosystem services and impact on social welfare.

OUTCOME: Data covering the five dimensions for each target sector of the economy

Intervention Opportunities: Policies and practices

The difference between the projected growth and development outcomes in the BAU scenario and the green growth vision for the HoB represents the change that needs to be implemented through interventions. An intervention could be at the policy level (e.g. targeted timber extraction volume), or a change in practices (e.g. local adoption of certification standards) or the development of new economic activity (e.g. selling REDD+ credits).

Different sets of interventions will be combined to produce alternative scenarios. The scenarios represent what projected outcomes could be achieved through the successful implementation of the interventions. These will be directly comparable to the BAU; interventions will be identified by sector (or across sectors), with the implications of these considered in the short, medium and long term for each of the five dimensions of green growth. To ensure the scenarios are locally relevant and acceptable to different stakeholders, the potential interventions will be generated and challenged through consultation with local stakeholders and subject matter experts.

OUTCOME: List of intervention options and scenarios

Economic Analysis

The modelling phase builds on the previous steps to produce robust quantitative analysis of the implications of the different scenarios and interventions identified. The proposed economic analysis utilises a macro-to-micro approach that analyses the short, medium and long term effects of potential policies and practices. The macro dimension considers the growth implications of different key sectors of the economy; in this case the principal sectors are mining, forestry, agriculture and palm oil, but it is also important to include transport, construction and manufacturing, as well as secondary and tertiary sectors. Micro analysis will feed into this as the implications of interventions on individual sectors and of localised activities is assessed.

The scale of development in each sector will have implications for i) the economy – in terms of GDP, government revenue, and employment; ii) for the environment - in terms of ecosystem service (water, carbon, biodiversity) supply and value;

and iii) for social development - in terms of equity, health and education. Table 3.2 below shows a potential output of the modelling of a specific intervention, it illustrates a score card showing the interaction between sector growth and the economy, environment and social development.

Table 3.2. Interactions between sector growth and the economy, environment and social development will analysed in the short (e.g. immediate impacts), medium (e.g. over 5 yrs) and long term (e.g. over 20 yrs).

	Economic GDP, Jobs, Investment			Environmental Carbon, Water, Biodiversity			Social Income, Equity		
	Now	2015	2030	Now	2015	2030	Now	2015	2030
Forestry									
Palm Oil									
Agriculture									
Mining									
Electricity									
Materials									
Construction									

The modelling process and data inputs (i.e., assumptions, coefficients and elasticities) will be sourced from multiple locations:

Primary Borneo data collection

Individual project-level data will be sourced from partners in the region and from the demonstration projects identified in this Section of the report. Primary data collection is important to bridge gaps where the impacts or issues are particularly location –specific, and where broad estimates are not possible.

Secondary Borneo data collection

Most of the input is expected to be secondary data specific to the states of Borneo and publicly available. Where data is not publicly available, but may be privately sourced, consultation and information requests to local NGOs, statistical agencies and other government and quasi-government departments will be essential.

Included in this category will be the modelling outputs of land-use modelling tools (for example, InVEST), which allows the intelligent spatial targeting of PES schemes. The macro-to-micro model identifies at a Borneo level the best set of projects to invest in. Land-use models add to the usefulness of such investment advice by recommending *where* these projects should be located. Such tools also allow the examination of biodiversity trade-offs and synergies which would not be captured at a granular level by the macro-to-micro model.

Extrapolation / interpolation of national data

National level data from the three countries will also be used to fill data gaps. The data will be extrapolated or interpolated at the Borneo level through making general assumptions (informed by relevant data) and through stakeholder consultation.

Case study: Logging – Impacts on GDP and the environment

An example of the analysis would be to identify the impacts of increased logging development. The implications on GDP are fairly straightforward to ascertain from available data, similarly the change in carbon stocks. However, the effect on water quality and supply is more subtle. Land-use modelling (using InVEST or a similar method to show distribution and value of ecosystem services) will be invaluable here, as the effects of logging on water quality and supply are highly location dependent. For example, logging in sensitive watersheds is likely to have a more important impact on the profitability of downstream agriculture and palm oil, compared to logging activities elsewhere (assuming comparable logging practices). These details will be set in the pre-modelling scenario setting stage, drawing on experience in other comparable areas to inform the relationships with sector growth; in this case lessons from Riau or Sumatra could be used to inform the model over the effects of logging in different areas on water quality and supply in the wider area. This analysis will be conducted for both the baseline and under a number of intervention scenarios. This will enable comparison between different types of intervention options as well as the change relative to a baseline or business-as-usual case.

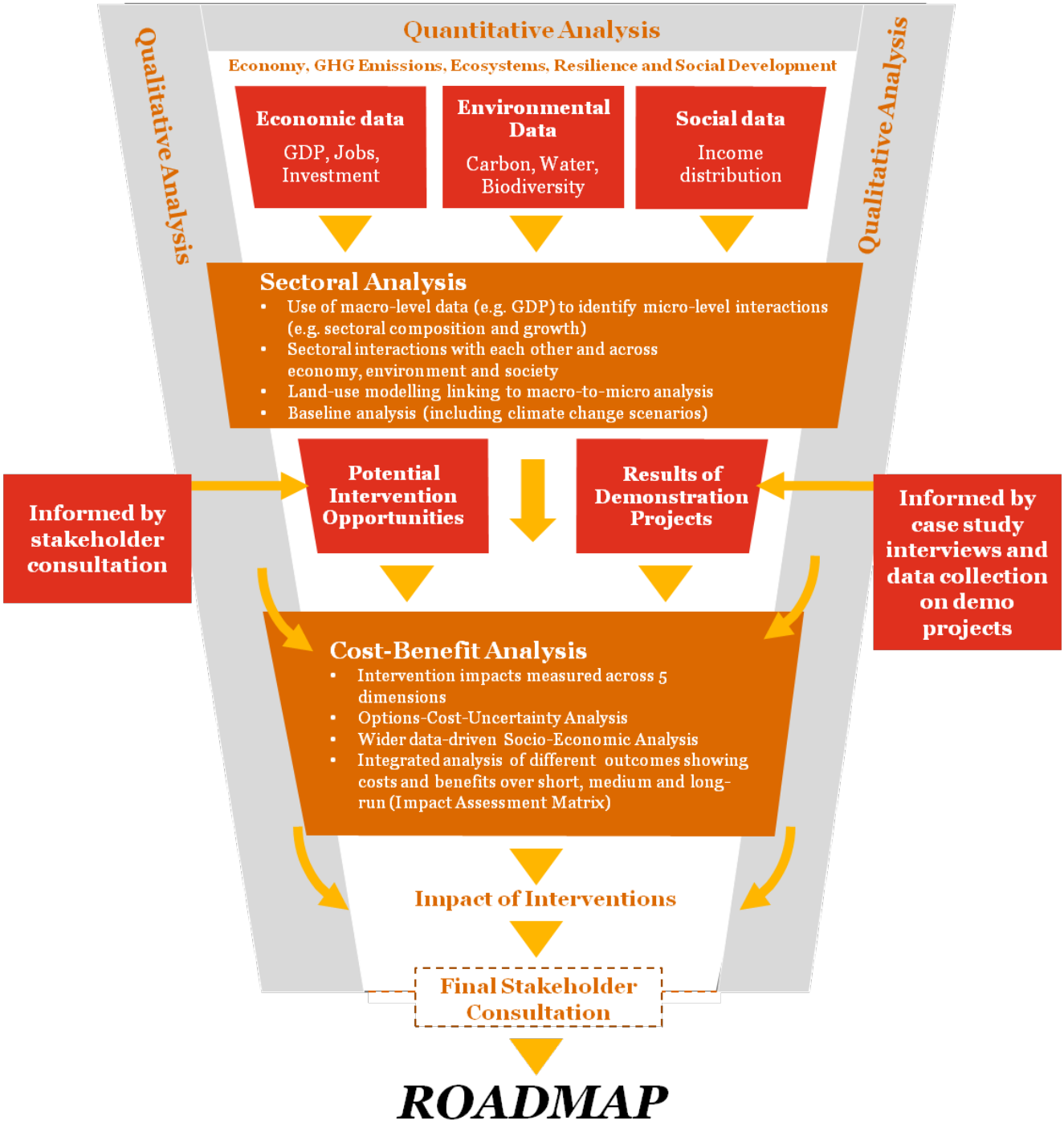
The steps of the modelling process are highlighted below (and in figure 3.1).

1. **Analyse the baseline:** considering the current state and confirmed future developments in each sector. Data on economic sectors, environmental interactions, and social development are collated to inform the sectoral analysis.
2. **Sectoral analysis:** baseline macro-level data will inform sectoral growth projections. Micro level and land use modelling will feed into the model to assess integrated implications for the economy, environmental quality and social development.
3. **Interventions and scenarios:** constraints and restrictions will be introduced into the model to represent specific interventions, packaged to produce different scenarios. These interventions will be considered at a spatial level to consider knock-on effects of change in specific areas. The model will output the quantitative implications of the interventions on indicators for the economy, the environment and social development.
4. **Cost-benefit analysis:** each potential intervention will be analysed with quantitative and qualitative metrics, the results of which will be presented in a score card, showing costs and benefits in each of the 5 green growth dimensions.

The model will produce data that will populate the intervention and scenario score cards which show the impact of different policies and practices. The practical output of the model is a set data on the impact of location specific interventions on the five dimensions of green growth. These will the need to be discussed with stakeholders to determine the optimal mix that can be combined into a Roadmap for green growth.

OUTCOME: Matrices of data for the impact of different interventions on the dimensions of green growth

Figure 3.1 The stages in the Macro to Micro Model



Source PwC

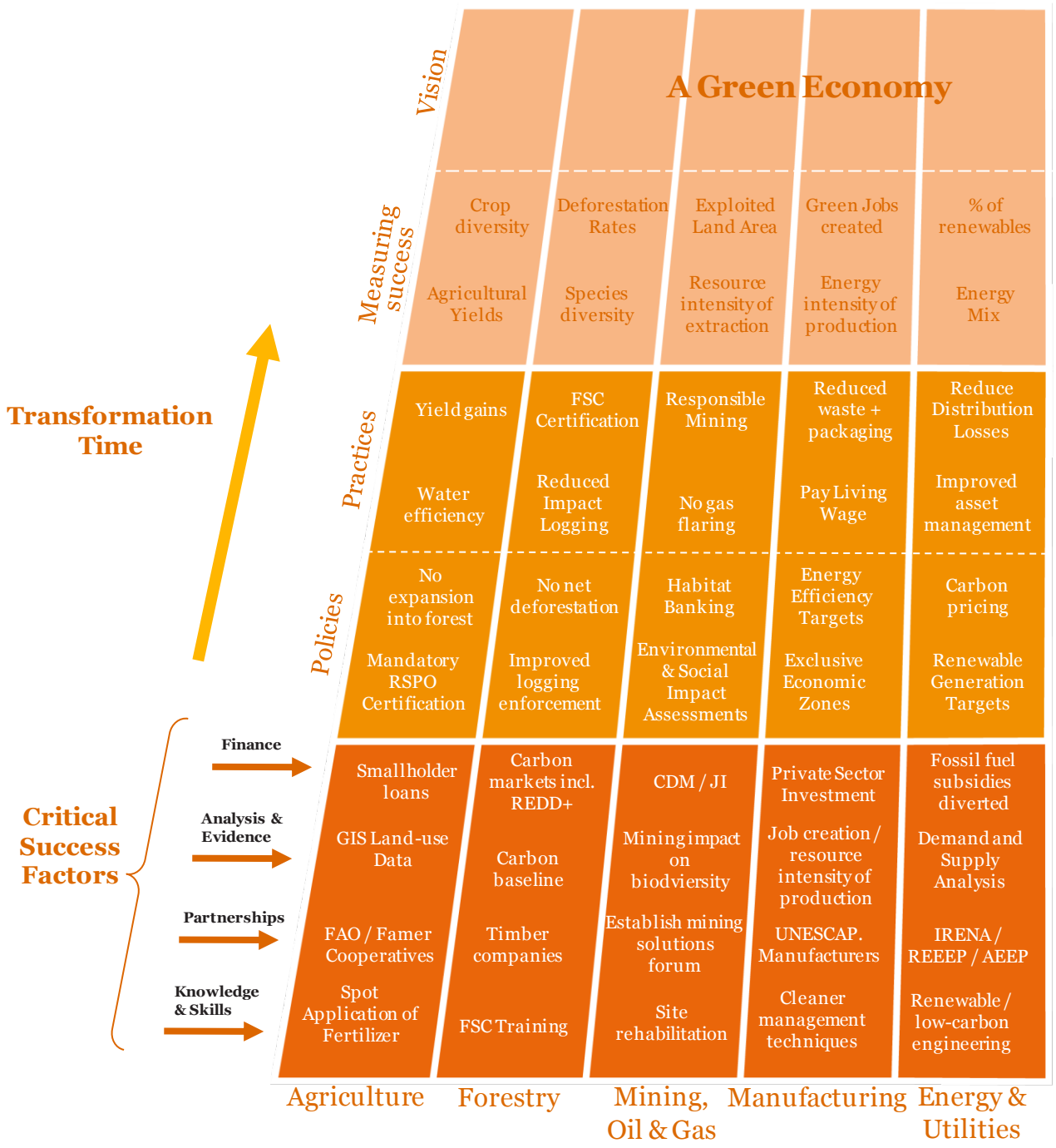
Roadmap

The Roadmap that results from the previous stages of the Generator process sets out a pathway towards a green economy including how to address the critical success factors for different sectors as well as the policies and practices that are needed for the transformation to a green and prosperous economy. This is presented in a stimulating and user-friendly graphic. An example of a Roadmap is included in figure 3.2 – although the suggested changes are illustrative only as such suggestions need to result from the visioning, evidence, analysis and stakeholder engagement process. Set out this way the Roadmap is also a pragmatic tool that provides a 'to-do list' to move from the baseline to the green growth vision. The Roadmap will include timings over which to implement changes based on the timings used in the scenarios. Bringing different interventions together shows how a transition to a green economy can be achieved.

The Generator is a living decision making framework. As policies are implemented and practices change it will be necessary to review the Roadmap to ensure that it still represents the optimal path to achieve the vision. If the vision changes (for example for political or other reasons) then it will be necessary to re-run the green growth generator process. Lessons can also be learnt from demonstration projects with the results fed back into the Generator so as to inform analysis and intervention options. Progress in achieving the vision should be measured. Suggestions for doing this are set out in section 4.

OUTCOME: A Roadmap of prioritised interventions for the transition to green growth.

Figure 3.2: Illustrative Roadmap for Green Growth in the Heart of Borneo



Source PwC


in the Heart of Borneo
Modal split and ridership
Electric car ownership
Number of eco-tourist nights
Average tourist stay and spend
School leavers into green economy
Attainment levels
Mortality Rate
Health Service Coverage
Super-fast connections
%GDP ICT sector
%GDP from professional services
Climate Resilient Networks
Maximum Capacity Utilization
Local tour guides
Respect local culture
Conditional Cash Transfers
Hire Graduates
Crisis Planning
Tele-primary care
Dematerialisation of consumption
Low carbon data centres
Breen business consulting Services
Carbon market activity
Fuel Economy Standards
Infrastructure Upgrades
Promote Eco-tourism
Minimize impact on Biodviersity
Online Training
Teacher Performance-related Pay
Guaranteed Rural Access
Family Planning
Cross-subsidizing rural-urban service
Expand Internet Access
Language training
Green taxes / regulation
PPP / IBRD / EBRD
Climate impact on infrastructure
UNESCAP Regional governments
Low-carbon vehicle design
Site charges / Private Sector Funding
Tourism Statistics
Global travel agencies
Languages / Service Skills
Public sector investment / PPP
School Performance
UNESCO Borneo Child Aid Society
Tertiary Education
Public sector investment / PPP
Infection Rates Hospital Coverage
WHO / NGOs
Formal medical training
FDI / PPP
Data Transfer Rates
Private sector ICT Organizations
Specialist ICT Knowledge
Private Sector Incentives
Employment Statistics
Cross-sector / international
Sustainability Knowledge Base
Transport & Infrastructure
Tourism
Education
Health
ICT
Professional Services

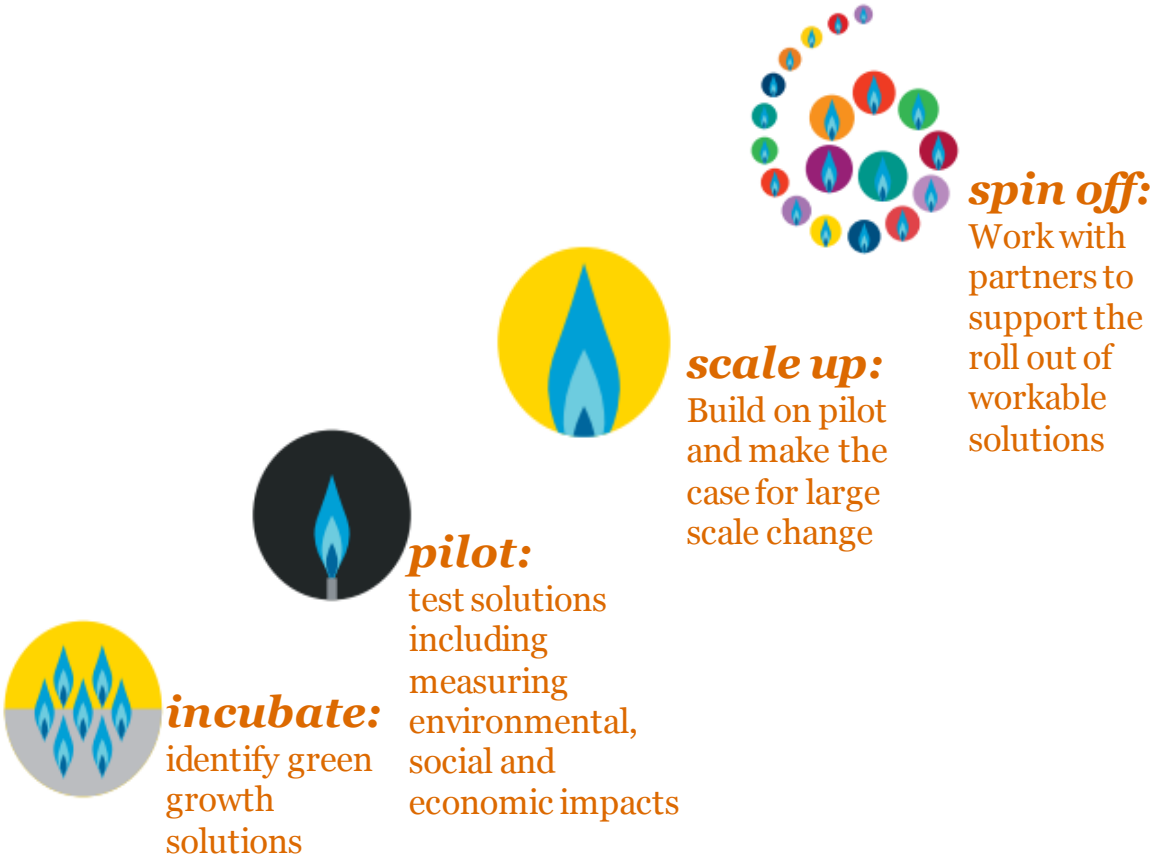
Source PwC

Implementation

Changes to policies and practices need to be implemented for the transition to a green economy to move from planning to reality. Exact implementation activities will depend on the interventions identified from the analysis and set out in the Roadmap. The development of green economic growth is not instantaneous, but will require a transition with sequential actions. However it is likely that needs will include addressing the critical success factors - skills and knowledge, finance, analysis and evidence, policy, and collaboration. Below we outline five major recommendations to make use of the Generator and to help implementation by securing the support needed to finance and resource the transition.

Action can start now. Included in our recommendations is the need for a number of demonstration or scaling up projects to be funded from a 'Sustainable Finance Facility for Green Growth' that we recommended is set up. Ideas for projects can be incubated by HoB partners (see the partnership forum recommendation) and then piloted or scaled-up. Furthermore, projects currently viable on a small-scale can be proven viable at the kind of scale necessary to contribute to regional green growth. Projects will produce learning to feed into the Generator process and also 'quick wins' in terms of emissions reductions, green jobs, the protection of biodiversity, climate change resilience and community engagement. Following the completion of the modelling phase and the production of a Roadmap demonstration projects can either be scaled up or stopped depending on the extent to which they contribute to achieving the vision

Figure 3.3: The progression from demonstration projects to scaled up multiple projects



Source: Adapted from Shell Foundation

Recommendations

Recommendation 1: Development of a Heart of Borneo 'Green Growth Generator'

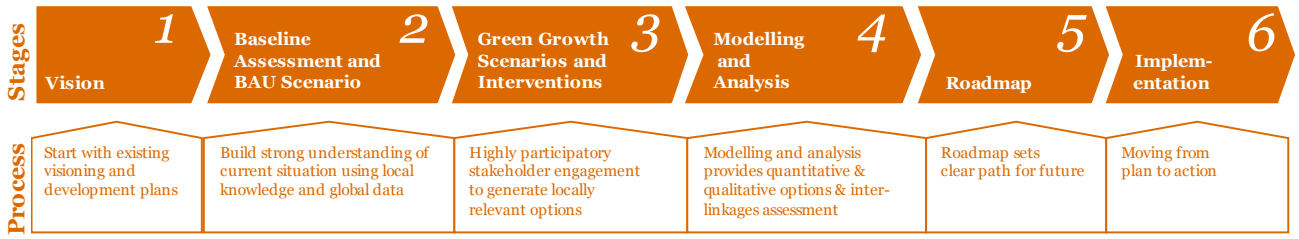
Rational

The analytical approach proposed in the Green Growth Generator can guide the decision making process through extensive stakeholder engagement and a rigorous assessment of potential interventions to help create a Roadmap that maximises the potential for an effective and efficient transition to a green economy in the HoB.

What is it?

The Green Growth Generator is a decision-making framework which could be developed in partnership with the HoB 3 and / or specific provincial / state / district governments within the HoB. It lays out the sequential steps required to identify and assess the relative costs and benefits of different policies and practices. It considers each in the context of the business as usual growth path, to identify interventions which can help achieve the specific green economic vision for the area. The principle output of the analysis is a Roadmap, which lays out the stages by sector, and over different timescales, to help ensure an inclusive and prosperous growth plan .

Figure 3.4. The generator lays out the steps leading up the implementation of interventions



Source PwC

How does it work?

The differentiating nature of the Generator relative to other analytical tools is that it sets out a holistic approach that is highly location specific, responding to local sensitivities and priorities. The analysis of interventions and scenarios integrates quantitative analysis of the economic, environmental and social metrics, with other qualitative themes such as climate change adaptation and social equity.

Estimated cost of the development of the green growth generator and data collection (for a HoB 3 wide process)

Development Phase	Cost USD
Conceptual framework development	85,000
Initial data collection from secondary sources and governments	65,000
Further data collection and stakeholder consultation[69]	140,000
Model development[70]	185,000
Scenario generation (inc 3 stakeholder workshops; incorporation into model)	120,000
Model audit and stress testing	15,000
Stakeholder feedback on findings (stakeholder workshops)	85,000
Reporting and review	110,000
Training and guidance manual	95,000
Total	**900,000**

[69] Assuming 30 interviews / discussions

[70] 3 London economists to work with modelling team

Realising the HoB Declaration

The Green Growth Generator provides an analytical framework and evidence to support practical interventions and initiate change as well as resulting in the development of policy interventions and implementation options, addressing a number of critical success factors in the transition to a green economy.

Tri-lateral programmes addressed

Transboundary Management; Protected Areas Management; Sustainable Natural Resource Management; Ecotourism Development

Recommendation 2: Heart of Borneo Green Economy Centre of Excellence

Rational

A Green Economy Centre of Excellence should be set up to build capacity (knowledge and skills) amongst stakeholders, including government officials, politicians, businesses and communities, to develop and implement green economy policies and practices.

What is it?

The Centre of Excellence would build capacity through:

- Training programmes for particular skills, such as MRV, environmental economics, green growth planning and policy-making, land-use management , FSC certification, and sustainable business leadership
- Knowledge management; an online HoB portal with research, statistics, analysis and decision-making tools, contacts and case studies about green growth in the HoB.
- Consultancy (advice and information) services to support policy making and practices in the HoB. Subject matter will include climate change mitigation and adaptation, agriculture, carbon markets, energy efficiency, biodiversity and ecosystems, sustainable finance.

How does it work?

The CoE would be a demand driven virtual centre that comes to the 'customer'. Stakeholders would apply to the CoE which would act as a procurement vehicle to bring the best knowledge and skills available globally to the HoB at local and / or national levels. The CoE would be run by a permanent team with overall responsibility for the capacity building programme and acting as the procurement vehicle and knowledge manager. The team would also support the HoB partnership forum (see recommendation 3) and could support the Green Business Network (see below). In particular the CoE would build capacity in local institutions such as national and local government offices of the HoB 3 countries, universities and research institutes, businesses and community based organisations to ensure the transfer of knowledge and skills to the local level. In order to best respond to requests for knowledge and skills for adapting to climate change the CoE could be linked to the Adaptation Committee which was agreed in Cancun which has a mandate to share knowledge and create partnerships.

The Climate and Development Knowledge Network (CDKN): PwC leads the alliance managing this GBP 55 million five year global programme part funded by DFID. The CDKN combines research, technical assistance and knowledge management to support national leaders, and policy makers as they shape medium to long term strategic plans, investment frameworks, leverage funding options and prioritise action around low carbon and climate resilient development.	***Green Business Network (GBN):*** Led by WWF this is a gateway to environmental solutions specifically aimed at businesses in the HoB. The GBN is dedicated to communicating sustainable solutions to businesses, providing them with support on government regulation, accessing new sources of finance, capacity building for sustainable practices and improving land management. PwC recently assisted WWF in the production of their Business Solutions report, focusing on forestry, palm oil and mining in the HoB.
Cambridge Programme for Sustainability Leadership (CPSL): The CPSL runs international programmes and policy and strategy dialogues for leaders in the private and public sectors. It encourages sustainability awareness and action, with six main themes: sustainable development, energy and climate change, business and poverty, partnerships and governance, consumption and production, and sustainable finance. They have over 3,000 alumni in over 40 countries, who can credit the CPSL for providing them with a stronger understanding of the principles of sustainability, and inspiring them to take effective action. over 3,000 alumni of CPSL's programmes in over 40 countries	***UNESCAP Green Growth Capacity Development Programme:*** This initiative seeks to introduce Green Growth as a solution for addressing the development challenges facing countries in Asia and the Pacific, while familiarising participants with the necessary assessment tools to measure environmental, economic and social issues towards the integration of Green Growth concepts into socio-economic planning. Since 2007 the programme has led seminars and workshops in Kazakhstan, Vietnam, Thailand, Korea, and Malaysia with participants including government officials, NGO's and business representatives.

over 3,000 alumni of CPSL's programmes in over 40 countries.	

Estimated costs of setting up and running the Centre of Excellence (for an initial 3 year period)

Activity	Cost (USD)
Set up costs and overheads	125,000
Secretariat staff costs	400,000
Procurement of expertise e.g. training programmes (1,250,000) secondments (250,000) advice and information (1,000,000)	2,500,000
Knowledge management	350,000
Total	**3,375,000**

Realising the HoB Declaration

The CoE addresses the second critical success factor, skills and knowledge. It would be used to strengthen trilateral process which named capacity building as one of the key five programmes.

Tri-lateral programmes addressed

Capacity building

Recommendation 3: Heart of Borneo Partnership Forum

Rational

A HoB Partnership Forum could be set up as a platform for coordinated stakeholder engagement that would stimulate and facilitate public private collaboration. The Forum would bring together policy-makers, donors, businesses and investors, and community and non-governmental organisations with the overall aim of accelerating and coordinating dialogue on green growth in the HoB and to act as an incubator of ideas.

What is it?

The Forum would constitute an online community (network) with a 'Partnership Portal' to facilitate dialogue and share information, supplemented with face-to-face meetings and events driven by the needs and interests of the three HoB governments and Forum partners.

How does it work?

The Forum would be supported by the Centre of Excellence which would act as a coordinator of Forum interactions and manager of the 'Partnership Portal' and would provide support for the convening of meetings and events. Given the wide scope of the green economy, different interest groups are likely to emerge and could form 'satellite' groups of the Forum. Forum partners would receive updates from the CoE about the latest green economy opportunities in the HoB and would be encouraged to respond to consultations and to develop green economy projects and investments, including for submission to the proposed green economy Sustainable Finance Facility (see recommendation 4).

Estimated Partnership Forum costs

It is proposed that the Partnership Forum would be supported by the CoE in order to realise synergies with knowledge sharing activities and to reduce set up costs and overheads. Costs for events and meetings have not been included as it is proposed that these would be driven and met by partners. Costs have been estimated for a 3 year period.

Activity	Cost (USD)
Partnership Portal	85,000
Partner updates	100,000
Promotion Activity	65,000
TOTAL	**250,000**

It is proposed that the Partnership becomes self-financing after 3 years with Partners paying a membership fee in recognition of the value of the information available on the portal and the Partner updates (NB these would have to be closed source on a privately funded model but would be open source if publicly funded at the outset).

Realising the HoB Declaration

The Partnership Forum addresses the third critical success factor, collaboration. It would be used to strengthen trilateral process in achieving each of the five programmes by garnering support and initiating green economy projects.

Tri-lateral programmes addressed

Transboundary Management; Protected Areas Management; Sustainable Natural Resource Management; Ecotourism Development; Capacity building

Recommendation 4: Set up a Sustainable Finance Facility for Green Growth

Rationale

It is recommended that a Heart of Borneo Sustainable Finance Facility for Green Growth is set up as a vehicle to fund demonstration and scaling up projects. Such a fund would test the financial viability of new green business opportunities in the HoB, demonstrate the viability of existing projects at a larger scale and establish a project pipeline to begin the scaling up process of both these types of project. The fund would aim to demonstrate that market failures that prevent progress on green growth - such as the additional costs of responsible production without commensurate price premiums, the risks that investors face in the current carbon markets and the high up front capital costs for some green economy projects – may be overcome with seed capital and experience of delivery. This would pave the way for a macro-scale investment fund to transform the HoB.

What is it?

The facility would be an innovative results based fund that would be open to businesses, the HoB governments (local and national) and non-governmental and community organisations. Requests for funding for joint ventures would be encouraged. The fund would be open to a wide range of green economy initiatives but would be measured against green economy success criteria, such as the contribution to green jobs and output, reduction in GHG emissions, contribution to climate change adaptation, and the protection and enhancing of ecosystems and biodiversity. Suggested criteria for measuring green growth are provided in Section 4, however the exact criteria for the fund would depend on the goals of investors in the fund and the decision of the fund management.

How does it work?

There are several different potential designs and financial mechanisms used by existing funds of this type. These include: challenge funds – where businesses submit proposals to receive grants and bids are considered against specific criteria (in this case the 5 dimensions of green growth); loans - provided to projects with repayments required at the end; investment funds – where investors expect a return on the financing they inject. It is recommended that this fund follows the challenge fund model because the aim is to stimulate new businesses and because returns to some green business activities are uncertain in the current policy environment. In its initial stage funds are expected to come from international donors and multinational corporations for climate and biodiversity reasons. If the fund can support the development of a pipeline of green economy projects then consideration can be given to the creation of an investment fund or to a loans-based fund in future. If localised socio-economic returns are realised then the three HoB governments should consider future funding. The fund and the projects could also be linked to the Climate Technology Centre and Network initiative that was agreed in Cancun to help prepare climate change projects and encourage innovation.

Good practice suggests that the fund should be independently managed and continuously evaluated to ensure transparency of the use of funds and best value for money. In order to maximise the value of public contributions to the fund strict leverage ratios should be considered (i.e. every USD 1 of public expenditure would be expected to leverage USD x of private investment). Some examples of different funds are presented below.

Congo Basin Forest Fund (CBFF): The USD 160 million CBFF aims to support transformative and innovative proposals which will develop the capacity of the people and institutions of the Congo Basin to enable them to manage their forests; help local communities find livelihoods that are consistent with the conservation of forests; and reduce the rate of deforestation. It encourages governments, civil society, NGOs and businesses to work together. Projects are selected by an independent panel based on the potential beneficial impacts.	***Global Alliance for Vaccines and Immunisation (GAVI):*** Supports access to vaccines in developing countries. GAVI operates through two financing mechanisms: i) encouraging donors to guarantee the price of vaccines, to incentivise development and speed up their development; and ii) from international donor commitments, against which it can borrow on capital markets – in this way it aims to raise USD 4 billion over the next 10 years. In addition, countries commit co-financing so the cost of vaccine procurement is gradually shifted onto the host country.

Africa Enterprise Challenge Fund (AECF): Funded by donor agencies including DFID, CGAP, IFAD and NMFA[71] the USD 50 to 100 million AECF supports innovative sustainable businesses. It targets funds to specific sectors, encouraging bids for limited resources, which are selected based on the merit of the project. Current projects include mobile banking in Sierra Leone, insurance for farmers in Mali, sorghum beer production in Burundi, sustainable smallholder cocoa and vanilla in DRC, agriculture pest protection research in Kenya, rice productivity improvements in Nigeria, local cassava sourcing in Sudan, and cattle breeding in Zimbabwe over 3,000 alumni of CPSL's programmes in over 40 countries over 3,000 alumni of CPSL's programmes in over 40 countries	***Business Innovation Facility (BIF):*** Funded by DFID, this 3 million fund aims to provide businesses of all sizes with technical assistance through advisory and facilitation services. It currently operates in 5 target countries, Bangladesh, India, Malawi, Nigeria, and Zambia. BIF aims to promote 'inclusive business models'; those that are profitable and engage the poor in their supply chain, either as employees, suppliers or distributors, through the development of affordable products and services that meet the needs of the poor. Businesses are required propose projects to an independent selection committee and to match donor funding.

Estimated costs of green economy fund for 3 years

It is recommended that the fund is initially set up for a defined period, for example 3-5 years with an initial capital injection that is large enough to attract match funding. The target amount to be raised is USD 35 million. Suggestions for the types of demonstration and scaling up projects that could be funded using this money are provided below. A fund of this size will not be sufficient to support the full transition to a green economy in the HoB, but rather set up a number of demonstration and scaling up projects in order to produce results and evidence.

- Sustainable Forest Management and Certification
- REDD+
- Payments for Ecosystem Services
- Agricultural Productivity
- Palm Oil Land Swaps
- RSPO
- Renewable Energy
- Bio-prospecting
- Securing Intellectual Property
- Eco-tourism

Once the fund infrastructure is established and funding activity evaluated to provide confidence in the success of the fund, further investment to a major transformation fund can be considered. It is estimated that hundreds of millions of dollars (USD) will be necessary to finance the transition to a green economy on a macro scale (much of this may be repaid in the long-run, even with return).

Realising the HoB Declaration

Finance is recognised as one of the critical success factors which, this fund would help address. Furthermore, it would provide a mechanism through which the tri-national five priority programmes can be addressed through funding different types of policies and practices.

Tri-lateral programmes addressed

Transboundary Management; Protected Areas Management; Sustainable Natural Resource Management; Ecotourism Development; Capacity building

[71] UK Department for International Development (DFID); The Consultative Group to Assist the Poor (CGAP); International Fund for Agricultural Development (IFAD); Netherlands Ministry of Foreign Affairs (NMGA).

Recommendation 5: Demonstration and Scaling Up Projects

Set out below are a number of potential projects to demonstrate or scale up green economic activity. They are presented for discussion with stakeholders in order to develop project ideas more fully, in particular the anticipated costs and benefits.

Sustainable Forest Management and Certification:

The substantial forest resources of the HoB hold great potential for revenues from sustainable forestry. To achieve continuing revenues from the forest sector sustainable management will have to be adopted; otherwise declining forest reserves and revenue will occur as has previously been experienced. Sabah's sustainable policy response to declining available timber holds valuable lessons for other state and national governments. Indeed, the Indonesian forestry roadmap emphasises the need to temporarily reduce production until adequate sustainable sources of timber can be provided. In September 2010 the Ministry of Forestry issued a decree that all forest management units in Indonesia must now be assessed under the Indonesian Timber Legality Assurance System, however legality does not necessarily guarantee sustainability.

The Forest Stewardship Council (FSC) provides one of the world's leading certification standards, however both Indonesia and Malaysia have national certification schemes, the LEI and MTCC. These schemes are working closely with the FSC to strengthen their conditions and processes and gain greater international recognition, and thus greater price premiums. A WWF assessment showed that while FSC timber from Borneo could achieve a price premium of 10% to 15%, premiums for MTCC were only around 1% to 5%.[72] The governments of Indonesia and Malaysia are now working more closely with the FSC to gain greater recognition for their national certification schemes in international markets. NGO's and industry bodies also need to work to ensure the certification bodies have the necessary capacity and support to maintain the credibility of the certification standard and monitoring and verification programmes.

Recognising the business opportunities provided by sustainable production a number of private companies are pursuing sustainable production independently. For example, Ta Ann is working towards FSC certification with the assistance of WWF for their concession in Sarawak, it hopes to be the first company in the state to achieve FSC certification. A number of other initiatives are available to help companies work towards achieving certification, including the Global Forests and Trade Network, The Forest Trust, and The Borneo Initiative. These need to be scaled up if sustainable production is to become widespread across Borneo.

The costs of implementing FSC certification on a plantation or logging concession are highly variable, depending on the location access, environmental and social priorities, technical and mechanical requirements, and existing production practices. The FAO examined the costs of implementing Reduced Impact Logging (RIL) (one of the potentially high cost components of FSC logging activities) in several sites in East Kalimantan. The results showed that in some cases RIL could have lower costs per cubic meter of produce than clear felling. In one site the costs where as much as a third cheaper (USD 3.8 / m3 against USD 5.7 / m3) due to more efficient log export methods. However, in another case RIL was found to be twice as expensive as clear felling. All sites where found to show reduced environmental impacts, by about half, as is consistent with other estimates.

Given the maturity of sustainable forest management projects and the existence of demonstration projects in HoB, applications to the Sustainable Finance Facility could be made for the scaling up of existing pilots or to demonstration projects in new areas of HoB. Economic data from such projects would also be fed into the Green Growth Generator to make a policy case for widespread scaling up.

REDD+

Financial incentives for sustainable management are essential to motivating companies to adopt and implement sustainability standards. A potentially significant source of supplementary income to support sustainable practices could come from the REDD+ mechanism. International negotiations at Cancun (see Section 1) have confirmed that REDD+ will play an important part in future mitigation efforts. The mechanism is currently in the capacity building and demonstration phase, however considerable interim funding is already available – including USD 1 billion from Norway for a verifiable reduction in deforestation in Indonesia. The amount of funding available through the finalised mechanism depends on its design, however, if it is channelled

[72] WWF, 2007 Natural Capital, Financing Forest Certification in Malaysia

through the carbon market the potential is very significant, with some estimates suggesting REDD+ could be worth upwards of USD 6,600 per hectare, making it highly competitive with extractive forestry, and palm oil.[73]

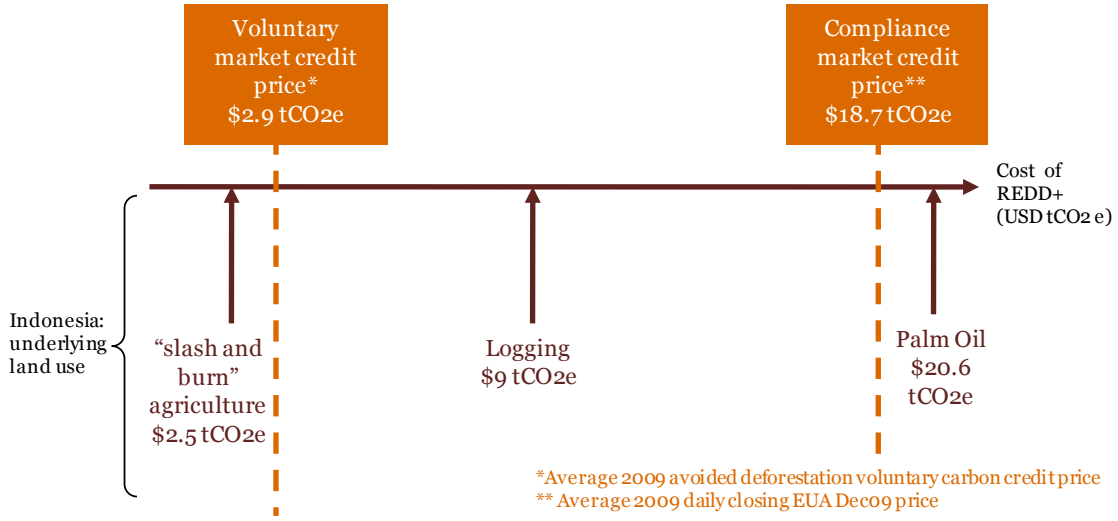
There are already a number of REDD+ pilot projects in Borneo. For example, the Rimba Raya Conservation project covers 91,000 ha in Central Kalimantan and is currently selling carbon credits through the voluntary market to Gazprom Marketing & Trading. The area was purchased by Infinite EARTH to avoid forest clearance.

The Ramba Raya project is a 'pure conservation' example, however, REDD+ projects can operate alongside sustainable forest management. For example, the INFA PRO project in Sabah is rehabilitating 25,000 ha of degraded forest, and is also selling carbon credits through the voluntary market. Following restoration the forest will be sustainably managed for timber and other forest products. It also serves as a buffer for the adjacent Danum Valley nature reserves.

The principle costs of setting up REDD+ projects depends on the alternative land use, for example, if the decision is made to reduce the area of forest land set aside for felling, the opportunity cost is the forgone revenues from the timber produced in that area over a given time period. Figure 3.5 shows estimated opportunity costs of REDD for different land uses, and the potential market price for credits. Currently even market prices in the compliance markets are do not cover the opportunity costs of palm oil, however, as regulations become stricter in the 3rd compliance period, the price is expected to increase, potentially up to even USD 50 per ton[74], which would made conservation an extremely attractive prospect for forest land holders.

Applications to the Sustainable Finance Facility could be made for feasibility studies for REDD+ to identify areas with the highest potential for carbon emissions reductions and for setting up of REDD+ projects. A number of potential REDD+ projects have already been identified in Kalimantan, including palm oil land swaps, Reduced Impact Logging (RIL) and community conservation and protected areas.

Figure 3.5: The opportunity costs of avoiding deforestation in Indonesia relative to volunary and compliance market prices



Source: PwC, based on IUCN

[73] Butler *et al.* Can REDD make natural forests competitive with palm oil? ITTO, 2010.

[74] Point Carbon, 2010.

Payments for Ecosystem Services (PES)

PES programmes are growing in popularity as a cost-effective performance based mechanism to directly incentivise improved land management. Under a PES agreement the beneficiaries of ecosystem services pay those with the ability to increase their provision through changes in their land-use practices. PES programmes can operate at different scales, some such as the Conservation Reserve Program of the US Department of Agriculture, have funding of more than USD 1 billion for improvements in environmental quality on agricultural land across 30 million hectares, others operate at a very much more local scale, such as the Singkarak lake project in Sumatra, Indonesia, which targets watershed rehabilitation on 2,700 hectares of critical watershed land.

PES programmes may be funded by governments, NGO's, or private companies. Businesses are increasingly recognising their dependence on ecosystem services, most notably water provision. For example, Krakatau Steel has a long standing relationship with conservation agencies in Banten, Indonesia, and finances improved watershed management upstream of its industrial operations to secure a reliable supply of clean water. The cost of implementing a PES programme depends heavily on the opportunity costs of changing land-use practices for the ecosystem service providers and the project transaction costs; it is therefore highly variable across projects. A pilot project in the Sumber Jaya watershed, Lampung, Indonesia, estimated the required costs to incentives an improvement in smallholder coffee production practices (through the implementation of erosion control techniques) to be about USD 170 per hectare.[75]

Applications to the Sustainble Finance Facility for demonstration projects would seek to develop capacity on the ground and to test the infrastructure needed for PES, the costs and benefits.

Agricultural productivity

Increasing agricultural productivity could provide rural communities with greater income and simultaneously reduce the pressure for further increases in agricultural land. In the HoB increases in productivity could reduce encroachment on intact forests which causes forest and land degradation. Production yields are below the regional average in Borneo for many crops, including rice, maize, soybeans, rubber, and, palm oil. There are considerable margins for improvement, for example, in East Kalimantan, dryland rice yields are 20% below Indonesia's average, and maize yields are 77% below average.

One reason for lower productivity is the prevalence of smallholders in Borneo. Smallholders represent a significant portion of palm oil production in Borneo, for example they manage up to 25% of the planted area in Kalimantan[76]. The Indonesian Palm Oil Commission estimates that smallholder productivity is about 2.5 tonnes per ha, compared with 4.1 tonnes per ha on large private plantations. Smallholder palm oil productivity can be improved through the provision of higher quality seeds, and more effective productive techniques. The governments of Indonesia and Malaysia both provide grants for smallholders looking to purchase improved seeds. In addition, the Palm Oil Research Institute of Malaysia is investigating the prospects of genetic modification of palm oil to increase productivity.

The East Kalimantan Investment Board of increasing productivity of different crops up to the Indonesian average. For example, rubber plantations could be planted over 3.3 million ha to produce latex, the investment would cost 94 billion IDR, but has a net present value of 176 billion IDR, and a payback of 10 years. Similarly, investments in pineapple production could be paid back in only 2 years.

Applications to the Sustainable Finance Facility could seek to test new crop yields, for projects that try to link productivity to REDD+ or for training in sustainable agricultural practices.

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[75] OECD, 2010, Paying for Biodiversity; enhancing the cost effectiveness of payments for ecosystem services

[76] BPS Kalimantan Tengah Dalam Angka 2009

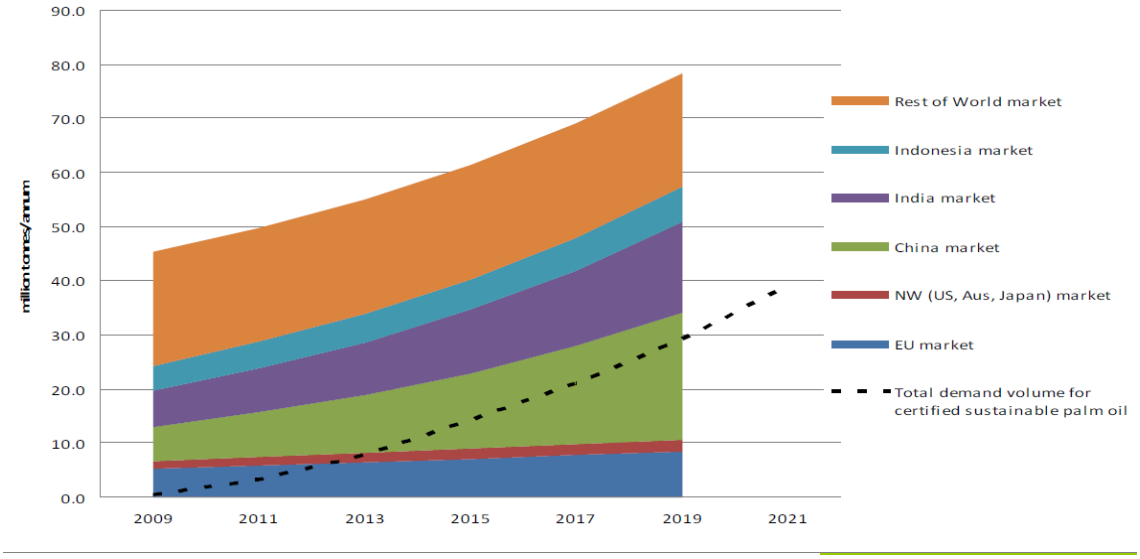
Palm oil land swaps

The governments in Borneo have put increased priority in directing palm oil expansion to idle land rather than forested areas. For palm oil companies with existing concessions in forested areas, but who have not yet developed their concession, it has been suggested that land swaps providing existing idle land to these companies instead of developing the forested land could be used to reduce future losses of forest. To incentivise companies to accept this proposal they would need to be compensated for any difference in revenues or costs which will need to be assessed on a case by case basis.

RSPO

The Roundtable on Sustainable Palm Oil (RSPO) certification scheme addresses many of the concerns regarding the potential impacts of palm oil production on the environment. However, producers do face costs in achieving RSPO certification and need to receive commensurate financial benefits to encourage continued expansion of RSPO. Producers in the HoB have indicated that price premiums are currently small and limited to specific markets and it is therefore important that demand for RSPO certified palm oil continues to increase at least in line with increases in supply. Demand for sustainable palm oil is increasing, and the RSPO has predicted that demand may reach 30 million tonnes by 2019 (figure 3.6).

Figure 3.6: Predicted demand for palm oil, and proportion of demand for certified palm oil.



Source: Verburg, presentation given to RSPO board, Düsseldorf, October, 2010

This predicted increase is based in part on the firm commitments of numerous major companies and retailers to exclusively source sustainable palm oil; for example, Walmart has committed to only use RSPO certified palm oil in Walmart branded products by 2015 and similar commitments have been made by Nestle, Proctor & Gamble, Unilever, and Kraft to name a few. In addition, the Netherlands, Europe's largest importer and exporter of palm oil (about 2 million tonnes annually), is the first country to commit to only sourcing from certified producers for its national industries by 2015.[77]

There are great opportunities for producers in the HoB to profit from such rapid increases in demand for RSPO products. Gaining certification can take some time and requires technical know-how, governments, NGO's, and private companies to work together to make it happen.

In Borneo there are currently 145,000 ha of RSPO certified plantations of which 12,000 ha are within HoB boundaries. For the most part, these are run by the large international producers with significant markets in western countries. However, the RSPO has a specialised task force which is working to bring RSPO certification to small holders and community groups. With demand predicted to grow considerably and price premiums to

[77] Manifesto of the Task Force Sustainable Palm Oil, Netherlands, 2010

track increases in demand, RSPO uptake in Borneo is expected to increase however costs vary and for some palm oil companies the change is not considered a viable business proposition.

Costs vary between producers depending on scale, location, initial production techniques and locally specific environmental and social priorities. The Malaysian Palm Oil Association estimates that the costs of establishing a new 5,000 ha plantation to RSPO standards are between USD 363,000 and USD 583,000 (USD 73 / ha and USD 117 / ha). The costs of implementing RSPO an established 3rd generation plantation are lower however, estimated as USD 135,000 for a 3,000 ha plantation (USD 45 / ha), and USD 268,000 for a 13,000 ha plantation (USD 21 / ha). At present the price premiums being realised by producers are low because supply is greater than demand. RSPO is therefore largely adopted by large international companies who wish to implement 'best practices'. While demand and price premiums are predicted to increase in the coming years it is not clear whether it will be cost effective for all producers in and around the HoB to implement RSPO standards, particularly smallholders. To help encourage uptake amongst smallholders the RSPO has a taskforce dedicated to improving the cost-effectiveness of the standards for them, either by encouraging group certification or by adapting the standards themselves to be more applicable to reduced scale production.

In addition, to encourage the uptake of RSPO until the market develops, and given the market failure around environmental externalities from some palm oil production, the Malaysian Palm Oil Association is considering an incentive payment payable directly to producers to cover some of the costs of RSPO compliance. Initial proposals suggest a payment of USD 30 per mt CPO, which assuming a productivity of 3 mt per hectar, this corresponds to a payment of about USD 10 / ha. Responding to externalities through effective policy is an important part of the transition to a green economy, and the costs and benefits of expanding policies such as this should be considered in the wider study.

Applications to the Sustainable Finance Facility could be to test the commercial viability of establishing RSPO plantations or to cover the costs of certification.

Renewable energy

The global renewable energy industry has grown rapidly in recent years. Annual investment in new renewable capacity was USD 150 billion in 2009, up from a little over USD 100 in 2007, bringing installed capacity up to 1 230 GW[78]. Renewable energy is attractive because it does not require carbon intensive natural resources like fossil fuels, and once the infrastructure is in place provides a low cost form of energy. Both Indonesia and Malaysia have renewable energy targets, of 17.5% of supply by 2025, and 11% by 2020, respectively. Brunei does not have a renewable target, but does aim to reduce energy intensity (energy use per unit of GDP), by 25% by 2030 from 2005 levels, recognising the importance of renewable energy, solar in particular, in meeting this.

Solar: Located on the equator, the HoB has good potential for the development of solar energy, with the region receiving between 4 and 6 kWh/m^2 per day.[79] This natural capital is renewable and could provide a substantial part of the electrical requirements for Borneo, although as solar produces intermittent power it is not suitable as a supply of baseload power. Solar technology is developing fast and is cheaper than some energy options, e.g. CCS, power plant biomass, but more expensive than others e.g. biofuels, wind power, geothermal. While being relatively land intensive the location of a solar plant is more flexible than most energy generation options, such that it need not come at the sacrifice of other natural resource values, such as forests.

Wind: A number of studies have looked at the possibility of wind power in Borneo, and in particular Sabah, which translates as ‘land below the wind’. However, while the name refers to its proximity to the typhoon belt, most studies have concluded that the state does not have the consistent wind levels appropriate for large scale wind power generation. There are however, some areas where commercial production could be feasible, in particular in Kudat, northern Sabah. While wind farms cover large areas of land, they can be located in conjunction with other types of land use, such as farming, to maximise the resource value of the area. Small scale wind power plants can also be an effective means of bringing electricity to isolated rural communities to reduce the need for fuel wood.

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[78] Renewables Global Status Report 2009 Update, *Renewable Energy World,* 2009.

[79] McNish *et al., Clean Energy Options for Sabah,* University of Berkley, 2010

Hydro power**:** With high rainfall and mountainous topography Borneo has huge potential for hydroelectric generation. On a macro scale the Malaysian government has plans for 5GW of hydroelectric capacity in Malaysian Borneo[80] and the Bakun Dam in Sarawak (2400 MW) is already in the latter stages of construction. However most of this electricity is expected to be exported to peninsular Malaysia[81]. To meet the growing electrical demand in Borneo in a low-carbon manner, widespread uptake of micro-hydro is envisaged (this is already a Sabah State priority). To demonstrate the feasibility of micro-hydro on a large-scale, pilot construction of micro-hydro facilities is recommended. Existing pilots have generated power for around USD 0.24/kWh[82]. This is cheaper than diesel generation once subsidies are stripped out. Moreover, this figure is heavily influenced by large capital expenditures, which were inflated by the extreme isolation of locations (supplies for one had to be flown in by helicopter[83]). Moreover the costs of cheaper alternatives such as coal or large hydro (both around USD 0.04-0.05/kWh) do not account for the large capital expenditures in extending the grid to rural areas (nor do they account for the costs of degrading natural capital). Furthermore existing pilots have not made use of selling carbon offsets to the CDM market.

Applications to the Sustainable Finance Facility could be for feasibility studies or for actual renewables projects, although these would have to be micro / small scale and / or match funded given the usually high costs of set up.

Bio-prospecting

Following the tenth Conference of Parties on the Convention on Biological Diversity in Nagoya, 2010, each signatory must ensure that Access and Benefit Sharing provisions are available for the use of genetic and biological resources, as well as traditional knowledge. Such regulations are particularly relevant to bioprospecting for pharmacological, chemical and cosmetics industries, as well as academic institutions. These activities will be required to draw up a mutually agreed contract with local communities and land owners for gaining access to biological resources, and sharing the benefits of any discoveries. As one of the most biodiverse areas in the world the HoB could hold the key to many potentially lucrative chemical compounds, which could provide an important source of revenues for local communities, supporting sustainable use and conservation in a green economy.

According to a Millennium Ecosystem Publication "Alarming levels of antibiotic resistance in many human pathogens is likely to provoke an increase in pharmaceutical bio-prospecting"[84]. Combined with expiring patents on older drugs, that "Big Pharma has struggled for a decade with a dearth of potential blockbusters"[85] and the recent international agreement on Access and Benefit Regulations agreed at Nagoya this could become a market opportunity for highly biodiverse areas such as the HoB. By way of illustrative numbers, it has been estimated[86] that pharmaceuticals would pay collection and shipping costs of USD 50-200 per sample and around USD 25 million in cash terms for a successful sample.

Applications could be made to the Sustainable Finance Facility for training for local government and communities in how to engage in the bio-prospecting industry and to raise awareness of access and benefits sharing.

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[80] Malaysia Economic Transformation Programme

[81] McNish *et al., Clean Energy Options for Sabah,* University of Berkley, 2010

[82] McNish *et al., Clean Energy Options for Sabah,* University of Berkley, 2010

[83] http://indigenouspeoplesissues.com/index.php?option=com_content&view=article&id=1497:a-simple-technology-for-complicated-woe-micro-hydro-in-sabah-and-sarawak&catid=62:southeast-asia-indigenous-peoples&Itemid=84

[84] Hassan et al (2005) Ecosystems and human well-being: current state and trends : findings of the Condition and Trends Working Group of the Millennium Ecosystem Assessment page 274

[85] Financial Times "Seven bets for a better year for business in 2011" 29th December 2010

[86] Lesser and Krattiger (2007); Valuation of bio-prospecting samples: Approaches, calculations, and implications for policy makers. in, Intellectual property management in health and agricultural innovation: A handbook of best practices. The authors assume 5% revenue-sharing on a $500m blockbuster drug. The likelihood of a successful sample is between 6 000 and 30 000. For comparison, in the 1990s it was estimated that there are around 750 000 new samples in the world's rainforests (Mendelsohn and Balick 1995)

Securing intellectual property

Many products produced in developing countries are pivotal to the multinationals who serve high-value markets. Through representation and education, it is possible for these countries to capture a more equitable share of these profits. For example, LightYearsIP, an NGO predominantly staffed by lawyers, managed to double Uganda's coffee export revenue of USD 100 million in 2006-2007 over the following year, recognising that the final product was worth over USD 1500 million in global retail markets. Improving market access and bargaining power at the same time as agricultural productivity would greatly assist socio-economic development objectives in the HoB.

Ecotourism

Eco-tourism also has great potential as a mechanism to provide increased revenues to support the conservation of natural capital while creating jobs. For example, the IUCN's cross-border protection areas initiative is investigating how eco-tourism can help support a conservation area linking Lanjak Entimau Wildlife Sanctuary (Sarawak), the Batanga Ai National Park (Sarawak), and the Betung Kerihun National Park (West Kalimantan). The project helps create demand for community business projects in buffer zones, for example through the planting of fruit crops and ponds for fishing.

Community-based conservation initiatives

WWF has already collaborated with local communities in creating Community Conserved Areas (CCAs). Using traditional laws and indigenous communities to protect biodiversity and ecosystems serves multiple green growth objectives creating social value through the preservation of local cultures and ways-of-life, natural value through sustainable resource use and the associated economic value realisable from PES, REDD+, eco-tourism etc. Supporting policy implementation and monitoring is essential to ensure the success of CCAs. Green & Fair products can be added to the economic mix in order to promote sustainable income-generation activities which create local livelihoods at the same time as protecting valuable natural capital.

Section 4: Measuring Success

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The Governments of the HoB have already started the path towards a green economy, most notably with the Declaration but also through other policies and initiatives as well as changing business practices. However, whilst the Declaration and the associated plans of action provide details regarding what activity needs to be undertaken, they are not expressed in terms against which is easy to assess progress (in particular from an economic perspective).

In designing the performance framework for the HoB it will be important to understand good practice globally and to benchmark the future performance of the HoB against international good practice in the delivery of green growth strategies. In developing the benchmarking framework it is necessary to be clear about the outcomes expected from the successful implementation of the HoB Initiative, and what are the critical drivers in delivering these outcomes. Therefore, the benchmarking framework developed for the HoB needs to address the key performance measures that need to be monitored at the level of both the HoB and the organisational structures which are established to deliver the vision. In seeking to identify good practice benchmark performance measures it is important to recognise that the HoB concept is unique in terms of its geographical setting, socio-economic context and vision, however the individual components of the HoB concept are amenable to appropriate good practice performance measurement at an international scale.

Therefore, success will need to be measured at the level of both the vision (i.e. green growth outcomes) and at the level of the institutional structures and interventions established to help deliver the vision (e.g. HoB Green Growth Finance Facility). The two success measures will be linked and interdependent. At all levels at which performance is measured it will be important to establish the "impact pathway" through which an intervention has led to the generation of specific outputs and outcomes, and for this pathway to be evidenced in a robust and analytical way as is possible.

Green growth can be measured in a number of ways, based on economic, social and / or environmental sets of indicators. As the OECD recommended in their report on green growth, the most balanced measure is likely to include all five sets of indicators. To dive deeper into green growth a specific emphasis is needed on green economic indicators and not simply on indicators of environmental change. This marks a departure from common measures of sustainable development, which tend to focus on the environmental impact of economic activity rather than the economic opportunity of natural capital.

Given this context indicative success criteria and associated indicators for measuring green growth are provided below. These criteria represent an attempt to provide a simple way of measuring the success of different green growth interventions as well as the overall progress made at a national or sub-national level in achieving green growth.

These high level outcome measures will then be delivered through different levers/ interventions that will have their own key performance indicators (KPIs) that can be tracked and measured. For example, the success measures could be used to develop the criteria for the green economy fund recommended in Section 3. Each of these interventions and associated KPIs will be linked to one or more of the five baseline dimensions described in the analytical framework. So there will be a baseline measure for each of these KPIs that can be tracked over time. Targets could be set for each of these measures over the short-medium-long term horizons.

Table 4.1: Some Key Performance Indicators for measuring the transition to a green economy

Dimension Essential element	Measurable component: potential KPIs
Economic Growth	
Output	Real GDP growth p.a.
Maximise in-country value added along production chain: Increase downstream activities to decrease economic pressure on primary resources.	Resource consumption and productivity: value added per unit resource used, by sector.
Green jobs	Total number employed in energy efficiency schemes, renewable energy sector, forest protection activities, conservation activities.
Export balance and competitiveness	FDI and Private Investment in Green industry
Greenhouse Gas Reduction	
Absolute GHG Emissions	Aggregate GHG Emissions in HoB Sectoral contributions and targets
GHG intensity	Carbon intensity [GHG/GDP] Carbon per capita
Climate Change Resilience	
Adaptive capacity	Progress towards implementing recommendations to reduce vulnerability
Agricultural resilience	Climate-Change Crop Resilience Index (ratio of a crop failure index to a drought index) Food security Shift to more resilient crop types
Industrial resilience	Infrastructural developments necessary Shift to less vulnerable industries
Personal resilience	Access to resources that help individuals overcome weather shocks – insurance, assets that can be drawn against etc.
Biodiversity and Ecosystem Services	
Maximise ecosystem service value: No net loss in value of priority ecosystem services. Minimise industry impacts.	Net deforestation reduction Change in ecosystem values (for each identified service) No net loss of habitat hectare (or equivalent indicator or metric)
Monetise ecosystem services: Realise the mechanisms necessary to ensure the values produced by ecosystem services can be monetised.	Implementation of REDD+ mechanisms; PES programmes; habitat banking Policy and regulations for environmental protection
Social Development and Poverty Alleviation	
Education	% STEM Graduates Number of graduates with vocational qualifications in forestry, land management and other environmental industries Spending on advertising low carbon and environmental goods and services % school children exposed to green economy issues in curriculum
Health	Life expectancy Infant mortality Medical facility access
Poverty	Reduction in population below the poverty line (% targets by 2012, 2015, 2030), urban and rural Number of households subject to persistent poverty
Equity and security	Gini coefficient Median wage vs. Average Income Jobs in formal sector Employment to population rate Long-term unemployed

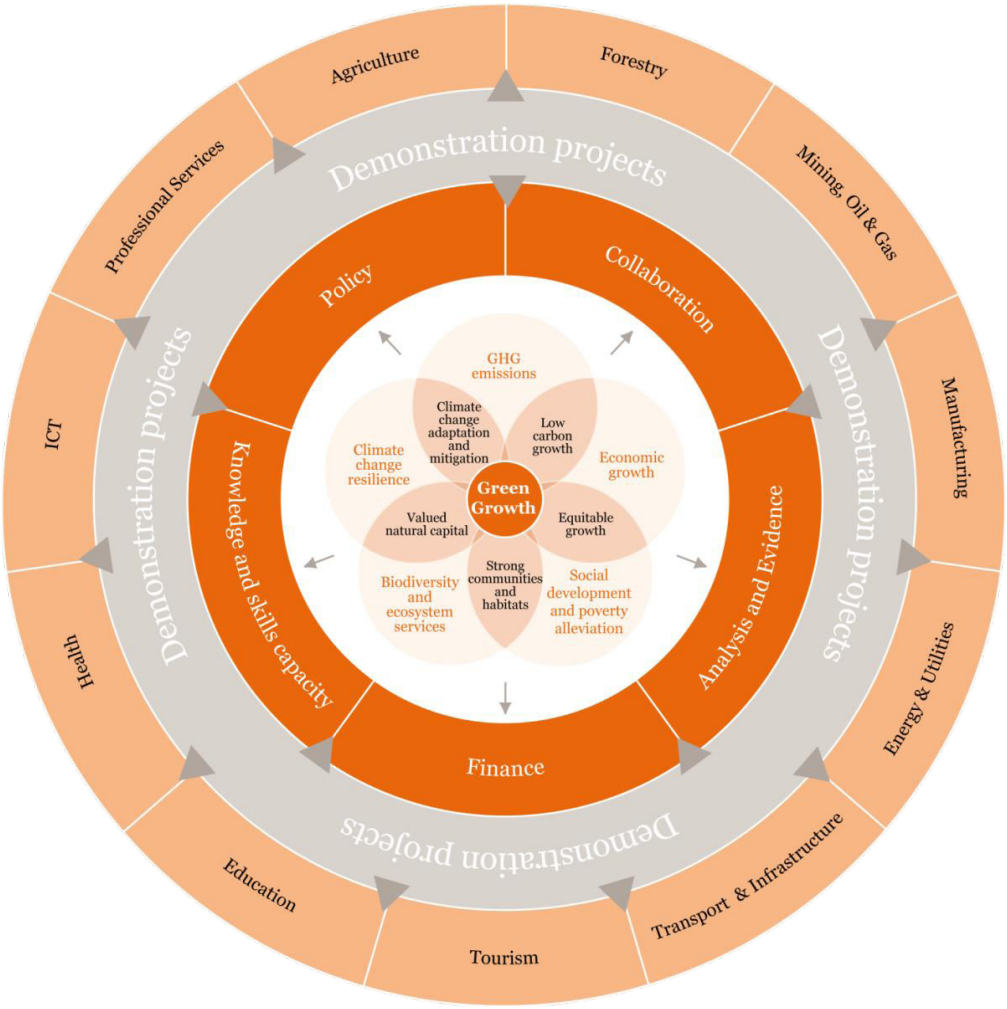
Section 5: An Integrated Approach to Green Growth

Section 5: An Integrated Approach to Green Growth

The preceding sections have outlined the different elements to analyse green economic growth and develop policies and practices with an aim of moving towards the vision for the HoB. The assessment of how an economy and the environment can be optimised to ensure long term prosperity for the local population, and wider groups, is a complex process. This is reflected in the number of elements and stages to our approach, however, anything less would underestimate the scale of the challenge but also the potential opportunities for a successful green economy in the HoB. Figure 5.1 the Integrated Approach to Green Growth depicts this approach.

At the centre are the five dimensions of green growth and the inter-linkages between them. From this starting point it is necessary to address the critical success factors of policy, collaboration (i.e. stakeholder engagement and partnerships), analysis and evidence, finance and knowledge and skills. When the critical success factors are addressed the process moves from planning to action with demonstration projects and change across different sectors of the economy.

Figure 5.1: the Integrated Approach to Green Growth



Source PwC

Appendices

Appendices

Glossary

Biodiversity
Shorthand for biological diversity: the variability among living organisms. It includes diversity within species, between species and of ecosystems.

Business as usual
The expected growth trajectory in the absence of any change in policy or interventions.

Cost-benefit analysis
The appraisal of an investment or a policy change that considers all associated costs and benefits, expressed in monetary terms, accruing to it.

Critical success factors
Elements which need to be addressed in order to lay the preconditions necessary for a successful transition to a green economy. The critical success factors are analysis and evidence, knowledge and skills, partnerships, finance, and policy.

Dimensions of green growth
Five factors which form the core of the principles of green growth. The dimensions are common across global green growth initiatives, but are not necessarily with equal weight, they are; economic growth, social development and poverty alleviation, biodiversity and ecosystem services, climate change resilience, and greenhouse gas emissions.

Economy in transition
A country that is moving from a centrally planned economy to a market-oriented economy.

Ecosystem service
A service provided by group of organisms (including humans in some cases) that is directly or indirectly beneficial to humans. Examples include the conversion of carbon dioxide to oxygen by photosynthesising plants, and the detoxification of harmful chemicals by aquatic and soil-based microbes.

Ecosystem
A dynamic complex of plant, animal and micro-organism communities and their non-living environment, interacting as a functional unit.

Externality
A non-market effect on the utility of an individual, or on the costs of a firm, from variables that are under the control of some other agent.

Governance
The way that a corporation or government organises and carries out its economic, political and administrative authority.

Green economy
A Green Economy requires a shift in the policy focus to emphasise environmentally sustainable economic progress to foster low-carbon, socially inclusive development.

Greenhouse gas
A gas such as carbon dioxide or methane that reflects infrared radiation emitted by the earth, thereby helping to retain heat in the atmosphere.

Green growth generator
A decision support tool to help drive the formation of policies and identification of practices which deliver economic, social and environmental outcomes, with the objective of first demonstrating the viability of economic transformation analytically and then outlining the necessary practical steps required to achieve it, set out in a roadmap.

Human capital
The knowledge, skills, competence and attributes embodied in individuals that facilitate the attainment of personal well-being.

Integrated approach
A conceptualisation of PwC's methodology for assessing the current state of an economy, in terms of the five dimensions of green growth, and the stages in analysis required to assess the economic, environmental and social implications of different interventions or scenarios.

Intervention
Policies and practices that if implemented will help advance the transition to a green economy.

Macro to micro model
PwC's Macro-to-Micro analysis combines quantitative and qualitative analysis to examine the impact of suggested interventions across the five dimensions of green growth. The quantitative modelling contains macro, micro and land-use data to accurately model intra- and inter-sectoral relationships between the economy, the environment and social development.

Market failure
A situation wherein market prices do not reflect the social opportunity cost of production or consumption. External effects or externalities are evidence of a market failure.

National accounts
The framework for recording the economic transactions of a country in monetary terms.

Natural capital
The renewable and non-renewable resources that enter the production process and satisfy consumption needs, as well as environmental assets that have amenity and productive use, and natural features, such as the ozone layer that are essential for supporting life.

Non-market value
The value of an asset not reflected in market prices. Generally it includes non-use values and those indirect use values (such as certain ecosystem services) and option or quasi-option values for which there is no market.

Non-use value
The value to humans derived purely from the fact that an environmental or cultural asset exists, even if they never intend to use it or see it in person. It is can be further sub-divided into existence value and bequest value.

Option value
The benefits accruing to individuals not from the actual use of an environmental asset, but from the option to use it in the future.

Public good
A special kind of externality in consumption where the availability of a good to one individual does not reduce its availability to others (non-rivalry) and the supplier of the good cannot exclude anybody from consuming it (non-excludability).

Resource

Generally, a tangible asset. In geology, resources refer to accumulations of natural materials that are known or expected to exist and for which there is a reasonable assurance that a given quantity of the material can be recovered economically at current or expected future market prices using currently available technologies or technologies that can reasonably be expected to become available in the foreseeable future.

Roadmap

A schematic representation of the 'to do list' for moving towards a green economy. Set out by sectors the roadmap lays out how the critical success factors can be addressed before the implementation of policies and practices over time to move towards a vision, measuring success of the transition throughout.

Social capital

The networks and shared norms, values and understanding that facilitate co-operation within and between groups.

Stakeholder

Somebody who has a "stake" or interest in a public policy, programme or, in some uses of the term, a corporation's activities.

Sustainable development

A development path along which the maximisation of human well-being for today's generations does not lead to declines in future well-being.

Use Value

A value obtained through the use of an environmental or cultural asset.

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