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This ESW is a contribution towards the African Development Bank’s work on Human Capital Development and Green Growth in support of the institution’s strategic objectives of fostering inclusive growth and the transition to green growth on the African continent.

The analysis and summary of the findings for the report were carried out by the Centre of Partnerships for Development (CAD). The report was authored by Fernando Casado, Johanna Klein, Philippe Jochaud and Julia Perez, with the support of Richard Niwenshuti and Ni Lu Made Ashanapuri Hertz.

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<td>AfDB</td>
<td>African Development Bank</td>
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<td>AMDC</td>
<td>African Minerals Development Centre</td>
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<td>DRC</td>
<td>Democratic Republic of the Congo</td>
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<tr>
<td>EDPRS</td>
<td>Economic Development and Poverty Reduction Strategy</td>
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<td>ESW</td>
<td>Economic and Sector Working Paper</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>FESPACO</td>
<td>The Pan-African Film and Television Festival of Ouagadougou</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GG</td>
<td>Green Growth</td>
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<td>GGKP</td>
<td>Green Growth Knowledge Platform</td>
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<td>GHG emissions</td>
<td>Greenhouse Gas emissions</td>
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<tr>
<td>GiZ</td>
<td>Gesellschaft für Internationale Zusammenarbeit</td>
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<td>GW</td>
<td>Gigawatt</td>
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<td>HCD</td>
<td>Human Capital Development</td>
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<td>HDI</td>
<td>Human Development Index</td>
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<td>HDR</td>
<td>Human Development Report</td>
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<tr>
<td>HTTI</td>
<td>Hospitality Tourism Training Institute</td>
</tr>
<tr>
<td>ICT</td>
<td>Information and Communication Technology</td>
</tr>
<tr>
<td>IFC</td>
<td>International Finance Corporation</td>
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<tr>
<td>IGG</td>
<td>Inclusive Green Growth</td>
</tr>
<tr>
<td>IIED</td>
<td>International Institute for Environment and Development</td>
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<tr>
<td>ILO</td>
<td>International Labour Organization</td>
</tr>
<tr>
<td>IWRM</td>
<td>Integrated Water Resource Management</td>
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<tr>
<td>LDCF</td>
<td>Least Developed Countries Fund</td>
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<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MSMEs</td>
<td>Micro, Small and Medium-Sized Enterprises</td>
</tr>
<tr>
<td>MW</td>
<td>Megawatt</td>
</tr>
<tr>
<td>NAPA</td>
<td>National Adaptation Programme of Action</td>
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<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
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<tr>
<td>RE</td>
<td>Renewable Energy</td>
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<tr>
<td>REDD+</td>
<td>Reducing Emissions from Deforestation and Forest Degradation</td>
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<tr>
<td>SCP</td>
<td>Sustainable Consumption and Production</td>
</tr>
<tr>
<td>SFM</td>
<td>Sustainable Forest Management</td>
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<tr>
<td>SMEs</td>
<td>Small and Medium-Sized Enterprises</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>--------------</td>
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<tr>
<td>Solar PV</td>
<td>Solar Photovoltaic</td>
</tr>
<tr>
<td>STEM</td>
<td>Science Technology Engineering and Mathematics</td>
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<tr>
<td>STI</td>
<td>Support Science, Technology and Innovation</td>
</tr>
<tr>
<td>SWH</td>
<td>Solar Water Heating</td>
</tr>
<tr>
<td>TVET</td>
<td>Technical Vocational Education and Training</td>
</tr>
<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nation Development Programme</td>
</tr>
<tr>
<td>UNECA</td>
<td>UN Economic Commission for Africa</td>
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<tr>
<td>UNECA</td>
<td>United Nations Economic Commission for Africa</td>
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<tr>
<td>UNICEF</td>
<td>Children’s Rights and Emergency Relief Organization</td>
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<tr>
<td>UNIDO</td>
<td>United Nations Industrial Development Organization</td>
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<tr>
<td>UNWTO</td>
<td>United Nations World Trade Organization</td>
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<tr>
<td>WB</td>
<td>World Bank</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<td>WTO</td>
<td>World Trade Organization</td>
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</table>
The following ESW analyses how Human Capital Development can contribute to Africa’s transition to Green Growth within the framework of the Bank’s Ten-Year Strategy for 2013-2022. It examines the linkages between Green Growth and Human Capital Development, with a special focus on inclusiveness and access to opportunities. Moreover, it presents examples and identifies potential entry points for Human Capital Development. The ESW is based on three country case studies (Burkina Faso, Rwanda and Zambia) and has been complemented with relevant examples from other countries in the region to provide a more comprehensive overview. The three countries are at different stages in terms of development and the integration of Green Growth, which allows conclusions to be drawn that can be applied to other African contexts. The study confirms the findings of secondary literature, demonstrating that the greatest potential for linking Human Capital Development and Green Growth in all three countries lies in the areas of skills development, job creation and green jobs. However, while health is recognised as being an essential component of human development and central to Green Growth, countries do not tend to relate it to Green Growth and Human Capital Development at policy and strategic levels. This situation reveals the lack of knowledge concerning those linkages at all levels and the need to develop specific programmes aimed at bridging this gap.

For Green Growth and Human Capital Development to thrive, a streamlined Green Growth strategy based on national priorities is necessary. The Green Growth strategy must help overcome sector-based thinking and allow for job creation in a number of strategic sectors, such as sustainable energy or sustainable construction. Experience shows that the implementation of an overarching Green Growth strategy is knowledge-intensive and calls for skills across all sectors and management levels. Capacity-building efforts are therefore instrumental for laying the foundations of adaptive management and stakeholders’ ability to implement a Green Growth strategy. To bring social transformation to fruition, skills development and job creation need to be at the heart of a country’s development strategy and must be well integrated into Green Growth objectives.

In the area of sustainable infrastructure, relevant linkages to Human Capital Development can be found across all the dimensions analysed, whether it is sustainable energy, construction, water and sanitation or sustainable cities and transport. The greatest potential for green jobs is found to lie in the area of sustainable energy through the development of new, decentralised technologies that hold the potential to meet the challenges related to access to modern energy, especially in rural areas. In the context of sustainable cities, the potential for job creation with regard to waste management, as well as water and sustainable transport is also significant. Entrepreneurship is another major driving force linking Green Growth and Human Capital Development in a number of areas such as the construction industry or with regard to new and innovative business models for water and sanitation or modern energy. This leads to the major challenge, which is skills development. All the aforementioned areas are rather new, and skills to bring about the transformation to greener infrastructure need to be provided on all levels. These range from technical skills in the field of maintenance to the systematic development of knowledge with regard to more sustainable construction techniques or materials.

As far as Natural Resource Management is concerned, agriculture is the major driver for inclusive Green Growth as 80% of the population’s livelihoods and 65–70% of the workforce are agriculture-dependent. Entry points for Human Capital Development include support and skills development in conservation agriculture and value chain development, especially with regard to biotrade. Other important sectors include forestry, tourism and mining. Promoting the participation of local communities as equal partners, especially in the area of tourism as well as the development of inclusive business models for the tourism supply chain are other important models that can boost economic development and foster Green Growth. As in the area of infrastructure, skills development, as well as professional training in all areas, remains a major challenge with regard to tapping into the existing potential.

Bringing about a transformation to an inclusive green economy will not prove possible without properly addressing resilience and adaptive capacity on the continent. Africa is a vulnerability hotspot when it comes to climate change and is expected to be more affected by climate change than any other continent. To overcome this challenge, the three countries analysed have developed National Adaptation Programmes to Climate Change. However, being able to implement these programmes calls for additional capacity on all levels,
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including areas as diverse as understanding climate interactions or data collection and monitoring. Based on the findings from the three countries and complementary research, a series of recommendations have been drawn up for the Bank. It is clear that the AfDB can become a catalyst for Green Growth in Africa. It has a crucial role to play in building human capital in order to progressively achieve green and inclusive growth across the entire region.

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Burkina Faso</th>
<th>Rwanda</th>
<th>Zambia</th>
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<tbody>
<tr>
<td><strong>Build Capacities and Strengthen Institutions</strong></td>
<td>Promote awareness and capacity building with regard to the benefits and advantages of Green Growth.</td>
<td>Support Rwanda in prioritising the specific fields of action, strategic sector policies and the means to make Green Growth operational.</td>
<td>Support the development of the Inclusive Green Growth Framework.</td>
</tr>
<tr>
<td><strong>Enhance Skills and Capacity-Building Programmes for Green Growth and Human Capital Development</strong></td>
<td>Assess the efficiency of the current vocational training system in all three countries and develop a sector gap analysis for vocational training and skills. Develop new programmes in sectors with specific relevance, especially energy and agriculture. Support programmes for the informal sector.</td>
<td>Promote skills development and capacity development in the tourism sector.</td>
<td></td>
</tr>
<tr>
<td><strong>Integrate the Private Sector in Promoting a Green and Inclusive Economy</strong></td>
<td>Support the involvement of the private sector through innovative technologies such as ICT or Agribusiness. Support the development of appropriate enabling conditions. Support the development of support schemes to reduce the skills gap and cut unemployment.</td>
<td>Development of a framework for joint ventures and partnership approaches, especially for CBNRM.</td>
<td></td>
</tr>
<tr>
<td><strong>Enhance Entrepreneurship and Inclusive Business for Human Capital Development and Green Growth</strong></td>
<td>Create innovative funding for promoting renewable energies, African crops and new manufactured goods based on natural resources. Strengthen social risk mitigation through micro-insurance programmes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Development of Green and Inclusive Value Chains</strong></td>
<td>Development of value chain approaches and creation of an adapted transformation industry that work with local raw materials. Support for agricultural value chains. Support for a more sustainable construction industry. Support in the development of the tourism industry.</td>
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<tr>
<td><strong>Data Collection and Analysis for Improved Resilience</strong></td>
<td>Connect data collection to products such as weather index-based insurance, etc. Support in building the capacity of countries in terms of data collection. Development of Climate Data Collection points.</td>
<td>Development of Climate Data Collection Points.</td>
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</tbody>
</table>
1. Introduction
The following Economic and Sector Working Paper (ESW) has been commissioned by the AfDB to analyse the positive impacts and correlation between Green Growth and Human Capital Development in Africa. It looks at how Green Growth strategies contribute to Human Capital Development and, at the same time, how Human Capital Development can contribute to a transition to Green Growth in selected African countries. There is widespread consensus that Green Growth in Africa is only a relevant concept if it encompasses poverty alleviation, health improvement, job creation, social inclusiveness and improved economic opportunities that simultaneously reduce inequality and address environmental degradation, climate change risks and natural resource depletion. (GIZ 2012, UNEP 2010 and UNECA 2013) However, no detailed analysis on the implications of Green Growth and Human Capital Development based on country case studies had been undertaken thus far. Hence, the ESW analyses how Human Capital Development can contribute to Africa’s transition to Green Growth within the framework of the Bank’s Ten-Year Strategy for 2013-2022 (see Box 1 for further information).

The in-depth study entails the analysis of policies, sector strategies and business models that not only promote green growth but also exert a positive impact on job creation, poverty reduction and better service delivery in health and education. It specifically assesses which education and training programmes are relevant to the labour market and provide opportunities for the creation of green jobs across sectors.

Box 1: AfDB’s Ten-Year Strategy

The Bank’s Ten-Year Strategy features inclusive growth and the transition to green growth as its two major objectives. The essence of the strategy is to bear an impact on inclusive growth that not only results in equal treatment and opportunities, but also in poverty reduction and a correspondingly large increase in jobs, as well as a gradual transition to green growth by helping Africa protect livelihoods, improve water, energy and food security, and promote the sustainable use of natural resources. Green Growth, as part of the Bank’s strategy, is defined as “the promotion and maximization of opportunities from economic growth through building resilience and managing natural assets efficiently and sustainably, including enhancing agriculture productivity, and promoting sustainable infrastructure.”
1. Introduction

The in-depth study entails the analysis of policies, sector strategies and business models that not only promote green growth but also exert a positive impact on job creation, poverty reduction and better service delivery in health and education. It specifically assesses which education and training programmes are relevant to the labour market and provide opportunities for the creation of green jobs across sectors.

This ESW is a summary report based on information drawn from three country-based studies (Burkina Faso, Rwanda and Zambia) selected by the AfDB on the basis of a series of criteria, including the existence of Green Growth initiatives as well as the eagerness, geographical coverage and potential for including Human Capital Development issues into its operations. To adequately apprehend the great variety of prevailing conditions and circumstances in Africa, the analysis has been complemented with relevant information and examples taken from other countries in the region.

While the study compares the findings of the different countries to ascertain commonalities and differences, the paper does not seek to draw a comprehensive picture, but rather to identify trends, lessons learned and best practices for the region.

It analyses linkages between Green Growth and Human Capital Development, with a special focus on inclusiveness and access to opportunities, and concentrates on examples and potential entry points for Human Capital Development.

The three countries are at different stages in terms of development and the integration of Green Growth, which allows conclusions to be drawn that can be applied to any African context, while giving specific examples of interventions taking their different development stages into account.

Anchored in the discussions, as well as the outcome of the kick-off meeting held at the AfDB, a decision was made to base the analysis on the AfDB Green Growth Framework. Said framework has been developed through the concerted efforts of different sector-based departments, and shows the potential that can be leveraged when various sectors work together.

A particular focus will be placed on skills development, including innovation, potential for job creation and training needs, and on impacts on health, emphasising how health is an essential component of human development and is central to sustainable development.

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Box 2: AfDB’s Human Capital Development Strategy

The AfDB’s Human Capital Development (HCD) Strategy aims to build skills for better jobs, including the provision of equal opportunities, while sustaining growth and making development greener and more inclusive. The HCD’s main focus lies on the development of skills and technology to boost the competitiveness of African economies and to lift people out of unemployment through job creation. At the same time, it focuses on governance, in terms of improving service delivery, especially for young people and women. Finally, it focuses on the development of inclusive financial and social systems, including aspects such as microfinance and social entrepreneurship.
2. Human Capital Development and Green Growth

Andrea Lamont
2.1. Green Growth and Human Capital Development in Developing Countries

Green Growth has become a global trending policy topic over recent years. In developing countries, Green Growth places an emphasis on sustainable economic progress to foster environmentally and socially inclusive development. Green Growth is expected to help developing countries to alleviate poverty, enhance employment opportunities and achieve social progress while still reducing ecological pressure, preserving natural resources and building resilience. (CDKN 2011, World Bank 2012, AfDB et al. 2013, AfDB 2012 and OECD 2012)

Countries’ ‘green growth vision’ is usually based on local circumstances, politics, the commitment to international targets, the capacity for change and the priorities of national, local and international stakeholders.

The scale and magnitude of ambition for Green Growth may vary among countries, i.e. some countries may remain focused on economic development by placing greater stress on the importance of environmental preservation, while others may decide that their economic structure needs to be adjusted. Furthermore, while there is growing understanding of the importance of Green Growth, developing countries do not necessarily have the capacities to put Green Growth principles into practice and to identify crucial aspects of practical policies to make the transition towards Green Growth. Moreover, the relationship between sustainable development and Green Growth is not always well understood. (GIZ 2012) If executed properly, the development of a Green Growth policy framework involves a broad spectrum of environmental, economic and social policies and touches upon all sectors of the economy. The development process of such a framework calls for significant long-term investment and innovation. Therefore, appropriate governance arrangements as well as capacity must be in place to facilitate the process. To address the needs for capacity development as well as the facilitation that are often lacking, many international organisations provide assistance in this transition process. For instance, the AfDB has adopted inclusive growth and the transition to green growth in its Ten-Year Strategy, particularly addressing infrastructure deficiencies, natural resource management and resilience building. (AfDB 2012)

Activities related to Green Growth should combine the potential for sustainable development with economic growth. Green Growth does not only focus on preserving the environment and building resilience, but also empowers citizens, increases employment opportunities and can thereby help alleviate poverty. Nevertheless, it should be noted that green policies alone will not diminish existing shortcomings, for example in the labour market. The Asian Development Bank states, “Green growth has great potential to create new jobs but it is not a substitute for a sound labor market”. (ADB 2010).

Human Capital Development is one essential strategy that policy-makers can apply to increase the capacity for Green Growth among citizens as well as government officials. The international discussion on the correlation of Human Capital Development and Green Growth mainly revolves around the issue of skills upgrading systems such as education and training. (OECD 2000, IMF 2004, Wilson et al. 2004, ECB 2006, APEC 2013, ADB 2010 and Hanushek 2013) Increased and new skills are necessary to compete in areas related to the transition to Green Growth and improved competitiveness can only be achieved if skills development is adequately tackled. Recent studies show that policy attention to capacity building in “greening” economies mainly focuses on the delivery of Technical Vocational Education and Training (TVET), as well as the early application of Science Technology Engineering and Mathematics (STEM) Strategies. (GIZ 2013; APEC 2013) TVET and STEM are both believed to be able to bridge the gaps that could help individuals put themselves forward for “green” jobs, as well as promoting skills that are required for people to address development and environmental issues for sustainable development. (GIZ 2013; UNESCO 2013; APEC 2013) As there is no standard definition of “green jobs”, the following report uses the definition set forth by the ILO (see Box 3).
2. Human Capital Development and Green Growth

The creation of green jobs goes hand in hand with the potential of Green Growth to bring newly adopted green technology and knowledge to a country. Opportunities exist in areas such as environmental preservation or restoration in various sectors such as agriculture, manufacturing, research and service delivery. It also includes jobs that support the protection of ecosystems and biodiversity, the efficient use of resources and the minimisation of pollution. Hence, upgrading skills and capacities to be able to compete in these positions is of paramount importance.

Relevant sectors include Renewable Energy Suppliers, Skills for Green Building Development, low-emissions and sustainable transportation, organic food production, etc. (ILO 2008) In addition, the promotion of green and inclusive entrepreneurship plays a crucial role in supporting the development of Human Capital Development with regard to Green Growth. Recent studies show the increasing number of Green and Inclusive Entrepreneurs and business models being established in developing countries. (UNDP 2013) Nevertheless, despite these developments, there is no blueprint on ways to develop human capital to make the transition towards a green development path.

The Human Capital Development agenda must be rooted in a proper assessment and must be compatible with Green Growth objectives, as well as the development agenda to support the transition towards Green Growth.

2.2. Green Growth and Human Capital Development in Africa

It is recognised that the different aspects of Green Growth are highly relevant for Africa. A number of international institutions have developed concepts and studies that analyse the relevance of Green Growth for Africa.

Furthermore, an increasing number of African governments, such as Ethiopia, South Africa, Rwanda and Mozambique, have developed Green Growth strategies, mainstreaming this concept into their sector-based policies and national development plans. As most of Africa’s economies depend heavily on natural resource exploitation, sustained growth can only be achieved if it is managed sustainably, as the overexploitation of natural resources and environmental degradation seriously jeopardise long-term economic growth and human welfare in Africa.

(ILO 2014)

Box 3: Green Jobs

Green Jobs: Jobs are green when they help reduce negative environmental impact, ultimately leading to environmentally, economically and socially sustainable enterprises and economies. More precisely, green jobs are decent jobs that: (i) Reduce consumption of energy and raw materials; (ii) Limit greenhouse gas emissions; (iii) Minimise waste and pollution; (iv) Protect and restore ecosystems; (v) Support adaptation to the effects of climate change. (ILO 2014)
that have been defined as especially relevant and potential drivers for growth in Sub-Saharan Africa are in line with the AfDB’s Green Growth strategy. Said sectors include agriculture, energy and, more generally, natural resource management, for example, through tourism or community-based natural resource management. (GIZ 2012, UNECA 2013 and AfDB 2012) The Africa Ecological Footprint report emphasises the relevance of sustainable natural resource management for the future of the continent. (WWF 2012) In addition, the sustainable use of natural resources has been defined as one of the major drivers for Green Growth in Sub-Saharan Africa. (AfDB 2012 and GIZ 2011) While agriculture is not necessarily one of the biggest sectors in terms of investment, the livelihoods of most Africans depend on agriculture. (AfDB 2012) The potential for green and inclusive growth is therefore enormous.

With regard to energy, access to modern energy remains one of the major challenges when it comes to Sub-Saharan Africa. Renewable energy holds huge potential for more inclusive growth, as well as job creation and is another major driver for Green Growth in Africa.

At the same time, the pressing need to adapt to climate change and improve the resilience of African countries is an area where a clear correlation between Human Capital Development and Green Growth can be drawn.

In line with the international context, the relationship between Green Growth and Human Capital Development in Africa has mainly been examined from the point of view of the potential for skills development, job creation and the development of green jobs. (GIZ 2012 and UNECA 2013) The potential for Green Jobs is especially noted in the area of creating access to sustainable energy (GIZ 2012), as well as with regard to sectors such as sustainable agriculture, biotrade, waste management and the development of low-carbon public transport systems. (UNECA 2013) However, as also mentioned in the UNECA study, for West Africa, training and capacity building that will fulfil this potential demand for green jobs constitute one of the major challenges.

Only if countries manage to develop the necessary skills to bring about a transformation into a green economy, can this transformation have an impact on reducing poverty in the medium and long term. (UNECA 2013) With regard to the health sector, there is a need to build resilience. (WHO 2011) Health is an essential component of human development and is central to sustainable development as it enhances quality of life and ensures a better future for people.

(UNA 2010) The Libreville Declaration on Health and Environment (WHO 2009) places emphasis on achieving health improvements and meeting the MDGs (UNEP 2008) through multi-sectoral actions and linkages between environmental conditions and health. For example, African Governments recognised the links between health and sustainable development, and are undertaking special efforts to identify the causes of mortal diseases in order to combat them. Health is directly and indirectly linked to many facets of sustainable development, and Green Growth and the adoption of proper policies to improve water and sanitation, climate change, housing, food security and gender equality, will exert positive impacts on the population’s state of health.

It is recognised that greener economies are not automatically more inclusive, offering more economic opportunities for the poor, and it is clear that trade-offs between “green”, “growth” and “inclusiveness” will occur. For instance, challenges include associated short-term costs, whereas benefits are only attainable in the medium to long-term, and not necessarily in the area where the costs previously occurred.

Another area are political trade-offs, where politicians might not be willing to invest in areas without yielding a direct short-term benefit. Irrespective of the stage of development, a change towards Green Growth will imply major structural changes and challenge the status quo. A long-term vision is therefore of the utmost importance.

Designing Green Growth in an inclusive manner will be a challenge that policy-makers and international organisations will have to face. The following chapter provides a number of insights into how the links between Green Growth and Human Capital Development can be created.
3. Green Growth and Human Capital Development in Selected African Countries
The following chapter provides an analysis of the implications of Human Capital Development for the different aspects of the AfDB’s Green Growth Framework using the three analysed countries (Burkina Faso, Rwanda and Zambia) and an additional literature review. It examines existing initiatives, revealing the gaps and challenges as they relate to Human Capital Development and providing insights into where further activity with regard to skills development and job creation might be fruitful.

Rather than providing an exhaustive overview, the chapter aims to show linkages between and implications of Human Capital Development and Green Growth.

In order to pursue such an approach, and based on several interviews and background research performed, a set of strategic areas have been identified as catalysts in the manner in which they enhance inclusive green growth.

Such areas have been used as major thematic lenses aimed at understanding not only the synergies between GG and HCD, but also the opportunities arising for African economies (see Figure 1).

Figure 1: Strategic Areas Driving GG in African Economies
The three countries, Burkina Faso, Rwanda and Zambia, have been chosen according to different criteria, including their geographical location, the extent of implementation of Green Growth initiatives on the political and on a sector-based level, as well as their development status and the eagerness of their governments to move towards Green Growth and to promote Human Capital Development. Figure 2 provides an overview of the three different countries, their development status, as well as some key figures with regard to Human Capital Development and Green Growth.

<table>
<thead>
<tr>
<th>Region</th>
<th>Burkina Faso</th>
<th>Rwanda</th>
<th>Zambia</th>
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<tbody>
<tr>
<td>Population Living Below the Poverty Line (%)</td>
<td>44.6 %</td>
<td>63.17 %</td>
<td>74.45 %</td>
</tr>
<tr>
<td>Income Inequality (Gini Index)</td>
<td>39.79 %</td>
<td>46.8 %</td>
<td>50.82 %</td>
</tr>
<tr>
<td>Adult Literacy Rate</td>
<td>28.7 %</td>
<td>65.9 %</td>
<td>61.4 %</td>
</tr>
<tr>
<td>Under Five Mortality Rate</td>
<td>102.4 per 1,000 births</td>
<td>55 per 1,000 births</td>
<td>89 per 1,000 births</td>
</tr>
<tr>
<td>Public Spending as a % of GDP Allocated to Health</td>
<td>3.4%</td>
<td>6.1%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

**Quantitative Indicators**

**Qualitative Indicators**

- **Green Growth on National Level (Legal) and Regulatory Framework**
  - No GG framework available, focus on unsustainable development.
  - Comprehensive GG framework in place, implementation of GG as a national priority.
  - First dialogues and study on potential for IGG took place. Intention to move towards an IGG framework in a participatory approach.

- **Priority Sectors for Achieving Climate Resilience**
  - Water, agriculture, livestock and forest/biodiversity.
  - Agriculture, forestry, water and energy.
  - Agriculture, tourism, infrastructure, health, forestry, water and energy.

- **Private Sector Participation**
  - Initiatives implemented by multinationals in agriculture.
  - Community Based Natural Resource Management initiatives in tourism.
  - Community Based Natural Resource Management initiatives in tourism and agriculture.

- **Promotion of Skills Development**
  - Creation of fund to provide technical support to green initiatives, major area of the Green Growth Framework.
  - Major government focus, as part of its current National Development Plan.

*Note: For an overview of all indicators used throughout the report, please see Annex 1.*
To guarantee the best possible impacts of Green Growth on Human Capital Development, the concept and implications need to be defined at national level and the definition of a country-specific strategy needs to involve all relevant stakeholders. As such, in each of the country-based studies, key stakeholders were met and interviewed to explore linkages and entry points for Human Capital Development and Green Growth.

The three countries are at very different stages in their development of Green Growth strategies (see country approach).

At international level, the IIED has developed a framework that provides principles for integrating social justice into green policy-making. To ensure that green policy integrates the potential for social transformation, structural drivers of social deprivation and empowerment of the poor need to be addressed, while at the same time greening the economy. The framework also strongly advocates local, adaptive and context-specific policies. (IIED 2014) These findings are in line with those at country level that emphasised the need for clear regulatory frameworks and an enabling environment that support Green Growth and Human Capital Development.

In Rwanda, the Economic Development and Poverty Reduction Strategy 2013-2018 (EDPRS II) acts as this overarching strategy. However, it was underlined that many of the action programmes to implement the Green Growth strategy, as well as the EDPRS II, are knowledge-intensive and call for new skills across sectors and management levels. Capacity-building efforts are thus instrumental for laying the foundations for adaptive management and stakeholders’ ability to implement the Green Growth Strategy. A study undertaken by the Rwanda Development Board found that ministerial staff need to increase skills in policy development, national

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3.1. Regulatory Framework and Enabling Environment for Green Growth and Its Implications for Human Capital Development

**Country Approach**

**Burkina Faso:** No Green Growth Framework available, focus on Sustainable Development.

**Rwanda:** Comprehensive Green Growth Framework in place, Green Growth as a national priority.

**Zambia:** First dialogues and study on potential for Inclusive Green Growth took place. Intention to move towards an Inclusive Green Growth Framework in a participatory approach.

To guarantee the best possible impacts of Green Growth on Human Capital Development, the concept and implications need to be defined at national level and the definition of a country-specific strategy needs to involve all relevant stakeholders. As such, in each of the country-based studies, key stakeholders were met and interviewed to explore linkages and entry points for Human Capital Development and Green Growth.

The three countries are at very different stages in their development of Green Growth strategies (see country approach).

Besides these different approaches to the issue, stakeholders in both Rwanda and Zambia emphasised the need to define their own concept of Green and Inclusive Growth and to clearly adapt it to the local context, as well as to integrate relevant aspects of...
planning, monitoring and evaluation, as well as on how to mainstream Green Growth into all these areas. Other organisations such as the Energy Water and Sanitation Authority mostly require practical skills for implementing infrastructure projects. Similar observations were made in Zambia and Burkina Faso, where government stakeholders underscored the need for skills development and capacity building at all government levels.

Though a crucial aspect, a Green Growth strategy does not suffice to achieve social transformation. Skills development and job creation must be at the centre of a country’s development strategy and must be well integrated into Green Growth objectives. Only then can future markets for the interventions of a Green Growth strategy be developed. Zambia has clearly identified skills development and job creation as priorities in high-level documents such as the 6th National Development Plan. Moreover, it has broken them down into sector-based policies, such as the target to create 300,000 new jobs in the tourism industry as part of the tourism strategy to be developed. The Rwandan Government has recently created the workforce development agency to tackle the issue of skills development at national level. The agency is mandated to train young people in the area of employable skills in demand on the market. While the agency is working successfully and 40% of the people trained thus far have entered the job market, the skills gap, especially in sectors such as construction, ICT, agriculture as well as environmental management has been defined as a major obstacle to achieving Green Growth in the latest private sector survey report. (Republic of Rwanda 2009).

Another important aspect in order to truly integrate Green Growth and Human Capital Development is through decentralisation. Many sector-based approaches, especially with regard to natural resource management, need to be implemented locally and in a decentralised manner. Decentralisation, as well as skills development among extension staff helps to create opportunities in rural areas, where most people’s livelihoods depend on agriculture and other natural resources. This includes the need to decentralise vocational training, as well as the need to properly train and build the capacity of extension staff in the different ministries.

3.2. Sustainable Infrastructure and Human Capital Development

Though African economies have been some of the fastest-growing economies worldwide, a lack of infrastructure hinders further development, and most of the population’s lack access to the economic growth the continent is experiencing. To overcome this stumbling block, cost-effective and sustainable infrastructure will be a major requirement for Africa in the future. At the same time, infrastructure, especially energy and the construction sector, is a major driver for economic growth on the continent, as well as an important source of employment.

The following chapter explores the linkages between sustainable infrastructure development, green growth and human capital development. Without seeking to be exhaustive, it analyses examples from the different countries and shows links with regard to job creation, skills development and health.

3.2.1. Low Carbon Energy

Country Approach

**Burkina Faso:** Low access to energy, aimed at becoming one of the major drivers for socio-economic development. Special focus on biomass, isolated projects with regard to Solar Energy.

**Rwanda:** High potential for collaboration at national level as increased access to modern energy is an important goal for the government. Some of the first Solar PV farms in East Africa.

**Zambia:** Focus on hydro energy development as the main source of energy. Promising approaches with regard to biomass.
Africa is one of the regions most endowed with renewable and clean energy resources, but the development of these resources is lacking and insufficient access to energy constitutes a major development barrier in many countries. Overall, in Sub-Saharan Africa, an average of only 24% of the population has access to electricity. (WB Fact Sheet: The World Bank and Energy in Africa) Access to electricity in the three countries analysed ranges from 13% in Burkina Faso and approximately 18.5% in Zambia. Taking this low access rate into account, energy is a key strategic sector for all three countries, as access to modern energy is a basic requirement for future competitiveness.

Major emphasis is placed on the development of new energy sources. Zambia for example aims to add 1,000 MW of hydro power to the grid, and Rwanda seeks to reach a target of 70% of the population with access to modern energy by 2017. However, access to reliable and modern energy, especially in rural areas, remains a major challenge, considerably reducing the possibilities for development and job creation. While hydro energy is well developed, there is huge untapped potential as regards other renewable energy sources, including solar energy, biomass and wind energy, which incur little opportunity costs. They hold huge potential for job creation, economic development and long-term energy security and provide the opportunity for the diversification of economic activity, as well as increased potential for education (GIZ 2011) Lacking access to energy is also directly related to health, as electricity in medical centres facilitates the use of more advanced equipment, and energy for refrigeration is necessary to store vaccinations or other medicine that can be used to prevent and treat diseases. (Karezeki et al.)

Solar PV and Solar Water Heating:
Solar PV or solar water heating are energy sources being developed in all three countries. In Rwanda, the first grid-connected solar plant in East Africa is underway. The plant has a total volume of 8.5 MW and seeks to help bridge the existing electricity gap. In Zambia, the Rural Electrification Agency implemented a Solar Mini-Grid connecting 400 households. To be able to capitalise on the potential of such projects, skills development for maintenance, as well as the development of new and adapted business models that will make operations affordable to communities and sustainable will be of importance. Based on a proposal made by the Energy Regulation Board in Zambia, future mini-grid projects should include the development of other income-generating services (such as the processing of agricultural goods) to take advantage of the benefits

3 The extension services, owing to their very mandate and nature, are supposed to deal with traditional, mostly illiterate rural households, in order to provide them with technical advice, not only on agricultural technologies but also on relevant subjects such as farm input supply, credit, marketing and farm management. (http://www.fao.org/docrep/006/y4973e/y4973e06.htm)
of such grids, as current experience shows that local communities are not even able to afford minimal fees. Skills development is also an issue as regards testing, quality control of imports, installation, and maintenance of solar home systems and other solar applications. In all countries, considerable skills gaps in these areas were identified, and sustainable energy must be integrated into formal education to leverage its full potential. UNDP together with the University of Zambia and the Chinese Government are currently planning a testing facility at the University of Zambia to tackle some of these challenges and facilitate the practical application of theoretical knowledge.

Biomass:
In all three countries, biomass plays a crucial role as one of the major energy sources for the majority of the population. In both Zambia and Burkina Faso, most of the charcoal being used is collected from non-managed forests with consequent impacts on deforestation. The sustainable use of charcoal to enhance the efficiency of wood-based energy can create decent jobs and improve health through reduced smoke and particulates emissions. Examples include the distribution of 40,000 cooking stoves by 3Rocks Limited in the Katete and Sinda Districts in Eastern Zambia, as well as other similar approaches. The acceptance of improved cooking stoves has been a major challenge in Zambia, as people are used to their old cooking stoves for cooking, roasting and heating, characteristics which are not necessarily supplied simultaneously by the efficient cook stoves promoted in the country. More awareness-raising will be necessary to afford efficient cook stoves the success they deserve.

The development of biogas digesters is another relevant area for job creation and the development of local MSMEs. The company Southern Biopower in Zambia has developed an adapted technology, in conjunction with the Zambian Water and Waste Water Association. Local artisans have been trained in the construction of digesters, which can act as a means to reduce residues, as well as create energy. Interviews with experts show the overall relevance of the application of biodigesters, as it provides job opportunities for relatively low-skilled labour in rural areas. The training programme offered by Southern Biogas led to the development of a number of small-scale SMEs and artisans around the country.

In Burkina Faso, similar experiences were carried out with the Burkina Faso National Biodigester Programme, which has led to the installation of 1,500 biodigesters (status as of October 2012). The programme benefited from the support of the Africa Biogas Partnership Programme on domestic biogas in five African countries, aimed at constructing 100,000 biogas plants in Ethiopia, Kenya, Tanzania, Uganda and Burkina Faso, and set to provide approximately half a million people with access to a sustainable energy source by 2017.

Box 4: Biogas for Public Institutions

Southern Biopower, together with the Rural Electrification Fund, is currently developing a capacity-building programme that aims to provide 100 schools and hospitals with the possibility to dispose of their waste, to develop organic fertiliser and, at the same time, cover their energy needs for cooking and heating. A training programme that trains local artisans in the construction of those biodigesters is currently being implemented. (Southern Biopower)
3.2.2. Construction

The construction industry is one of the fastest-growing industries in many countries in Sub-Saharan Africa. In Zambia for example, the industry has been growing at an average of more than 10% in the last eight years and the ILO calculated that, to achieve the target of Vision 2030, it would be necessary to develop 1.3 million new dwellings, which would be one house every two minutes in the next 19 years (Green Jobs Programme – Building Construction Sector, 2013). At the same time, 80% of the national housing stock is informal with poor or non-existent services (Vision 2030). Similarly, in Burkina Faso, more than 70% live in precarious habitats while, at the same time, the construction sector has been growing by an average of 7.5%. Until 2020, job creation potential in the construction sector in Burkina Faso is expected to reach almost 100,000 people. (Le Gouvernement du Grand-Duché de Luxembourg 2014)

The construction sector thus presents an interesting entry point for Inclusive Green Growth given its growth potential, its immense potential for job creation on all skill levels as well as the fact that it is an important generator of GHG emissions. In Zambia, the ILO-led multi-donor programme on Green Jobs in the Construction Sector is tackling this challenge in an integrated manner. It is examining the construction industry’s entire value chain, tackling Green Growth, as well as skills development, job creation and the protection of workers in an integrated manner, from sourcing local and more efficient materials to the development of building standards and business development training for MSMEs. The programme is also partnering with the private sector, especially the mining industry to create the demand for greener construction in the

Box 5: Expected Results of the Green Jobs Programme

The ILO Green Jobs programme aims to create 5,000 green and decent jobs, to improve the quality of 2,000 jobs with regard to OHS in the construction industry, to raise families’ annual income that is dependent on construction by 10%, to contribute to the number of buildings using green technologies (150 buildings), to reduce monthly household energy and water consumption by 10%, to change the attitude towards green business by 5% among the general public and 10% in the sector. (Green Jobs Programme – Building Construction Sector, 2013)

Entry Points for Human Capital Development:

Development of green jobs through new decentralised technologies, such as solar, small hydro or biomass energy.
Promotion of entrepreneurship and inclusive business programmes around electricity access.
Skills upgrading for maintenance, installation and testing with regard to solar energy and other RE technologies.
Development of programmes related to access to energy and health, including improved treatment possibilities, possibilities for prevention and treatment of diseases through vaccinations and medicine that need refrigeration.
industry’s new housing developments. The Government of Burkina Faso defined the construction of social housing as one of its major priorities and is planning to build 10,000 homes. Though still in its planning phase, the programme includes the experimental production of units using local materials, which could be an opportunity to promote green construction in Burkina Faso. An example where Green Building is already in place is South Africa, which has introduced a Green Building Code, enforcing regulations with regard to buildings’ energy efficiency and making the use of Solar Water Heating (SWH) mandatory in new construction. It is expected that the implementation of the new building code (in effect since 2011) will create around 18,000 jobs by 2020. (Media Club South Africa) None of the three countries analysed has chosen this path; however, this would be one possibility, especially in areas such as social housing, where the AfDB could support governments in advancing GG as well as in skills development and job creation.

3.2.3. Water and Sanitation

Country Approach

**Burkina Faso:** Low access to water and sanitation, most important initiative is the IWRM.

**Rwanda:** IWRM and private-sector participation with potential for the creation of green jobs and positive impact on access.

**Zambia:** Implementation of initiatives to decentralise the access to sanitation. Implementation of demand-side management programmes for efficient water use.

Access to water and sanitation remains a challenge for Africa. Despite significant progress in the last 25 years, Sub-Saharan Africa is the only continent that is off-track in achieving the MDGs by 2015, with only 58% and 31% with access to water and sanitation services, respectively. (World Bank 2011) However, major disparities between countries are noted. While countries like South Africa are about to reach universal access (91% for water and 77% for sanitation), other countries lag far behind, either in terms of access to water (38% in Ethiopia) or sanitation (19% for Burkina Faso). Disparities are also observed within the countries between rural and urban areas, the latter having twice the coverage of the former, both in terms of water (83% in urban areas vs. 47% in rural areas) and sanitation (44% vs. 24%). (WHO 2010) Similarly, considerable gaps are noted based on household incomes, the poorest depending on water vendors and paying more than ten times more for water compared to middle-class urban dwellers serviced by piped-water supplies. (AfDB 2000) Furthermore, the increased climate variability characterised by drier conditions or floods and rising demand in the context of demographic growth considerably exacerbates the problems of water scarcity and management.

**Entry Points for Human Capital Development:**

Promotion of local materials, energy efficiency, the development of building codes, especially with regard to social and low-income housing.

Skills training on new building technology, the use of locally available materials for all levels, from architects to construction workers.

Promotion of entrepreneurship and inclusive business programmes in the construction supply chain.

Improvement of working conditions in the construction supply chain.

**Impacts on health:** Through improved working conditions, as well as the use of more eco-friendly materials with less impact on the health of workers and tenants.
Water and sanitation-related diseases remain some of the most significant health problems in Africa, especially in the case of children. There is a direct link to diarrhoea that kills thousands of people every year and also increases the risk of further diseases among people living with HIV. In terms of gender, women and girls are especially affected by the lack of access to water and sanitation since they are usually responsible for household water supply and sanitation. Water-fetching labour can result in back and neck damage. It steps up the risk of physical assault and rape and prevents girls from attending school properly. Moreover, women are rarely consulted or involved in planning and management, and there is a considerable lack of empowerment at this level. Improving access to water will allow women and girls to devote more time to other activities that will enhance their economic and social empowerment; for example, through literacy programmes, skills development and the promotion of income-generating activities.

When it comes to water resource management, Integrated Water Resource Management (IWRM) has been widely accepted and mainstreamed across policies. The concept is closely linked to IGG since it takes social, economic and environmental objectives into account, assessing water resources within each basin, evaluating and managing water demand, and seeking stakeholders’ participation. In Burkina Faso, the government adopted a national water policy, integrating the principles of IWRM in 2001. It implied reforming the national water infrastructure, promoting broader public participation, consensus-based decision-making for issues related to water conflict and local-level management of water basin committees (see Box 6). Similarly, Zambia in 2005 (Republic of Zambia) and Rwanda in 2011 (Republic of Rwanda) adopted IWRM as the core of their water resource policies. At the same time, Zambia is placing an emphasis on water demand management to raise awareness of efficient water use, as well as to improve the quality and existing quantity of water. (MOTENR 2011)

It seems essential to fully involve both women and men in demand-driven water supply and sanitation programmes for ensuring their success as it is widely accepted that the effectiveness of a project is much higher (six to seven times according to a World Bank evaluation of 122 water projects) when women are involved than when they are not. An important role in sustainable water management will also come from the re-evaluation and rediscovery of traditional knowledge and techniques (e.g. stone lines, stone terraces, river bank protection walls, etc.). (African Technology Policy Studies Network 2006) Using renewable and recycled resources and materials that are available locally is more cost-efficient, flexible and bears less environmental impact. (UNESCO 2010)

At the same time, private-sector participation provides potential for green jobs in areas of water and sanitation. Especially when it comes to the access of the urban poor, promising social and inclusive business models have been developed in the different countries. In Kenya, the Athi Water Services Board of Nairobi received a grant of almost 3 million euros to introduce sanitation in informal settlements through social business ventures,
led by women in particular. (African Water Facility 2014) In Rwanda, Manna, a social enterprise, has developed the first project that is financing access to clean water through carbon credits. The project is being implemented in partnership with the Ministry of Health, and it is planned that, through the project, 30% of Rwanda’s population will have access to clean water through the application of simple water-treatment technology that filters drinking water, instead of having to boil it. The project has previously been rolled out in Kenya, reaching 4.5 million people and generating annual revenues of 6 million dollars. The project’s success lies in its integration of all relevant stakeholders, as well as its business model. Partnering with the government, while developing a business model that creates jobs and provides the possibility to earn carbon credits has proven a valuable mix. In Zambia, SNV in collaboration with local stakeholders has begun work on an initiative to improve sanitation. Sanitation has recently been decentralised by central government and activities are focusing on strengthening local structures, as well as creating social business models for job creation. Water and sanitation do not only provide opportunities with regard to access but also for new and innovative business models and products. One example would be the Sustainable Health Enterprise in Rwanda. They have developed low-cost and eco-friendly sanitary pads for women and girls, produced from banana fibre. The social business helps women set up their own enterprise using local raw materials, and thereby increases the income of vulnerable groups (including 6,000 farmers), while simultaneously increasing accessibility and affordability of a much needed product. (sheinnovates.com)

3. Green Growth and Human Capital Development in Selected African Countries

Box 6: Participatory Management of Water Basins in Burkina Faso

Water basin committees are a crucial part of Burkina Faso’s IWRM Action Plan. Members include local government representatives, state authorities, technical experts and water users, who come together to monitor water quality and use – especially for agricultural production – and the usage impact on people and the environment. The committees base their planning on this information, aiming for fair water use that minimises conflict and maximises productivity. The committees are used as boards of directors for newly established basin-level government water agencies while water agencies comprising technical experts, in turn, implement the committees’ recommendations, collect water-user fees and perform relevant studies. These committees also provide a forum for stakeholders to share information and voice concerns about water management in their basin.

Entry Points for Human Capital Development:

Skills development for improved access to water and sanitation.
Job creation and development of new business models through the use of traditional knowledge and adapted technologies.
Development of entrepreneurship and inclusive business programmes to strengthen the capacities of entrepreneurs working in the field of sanitation and related products.
Develop community-based water management systems, empowering local communities (and especially women).
Impacts on health: Reduction of diarrhoea and other water-borne diseases through improved access to water and sanitation.
3.2.4. Sustainable Cities and Transport

**Country Approach**

**Burkina Faso:** Urban population growth to reach 35% by 2025. No specific activities with regard to sustainable cities. Focus on more sustainable transport to reduce CO2 emissions.

**Rwanda:** Cutting-edge country in the region in sustainable-city initiatives.

**Zambia:** Activities with regard to efficient water use, sanitation and waste management, as part of the SCP policy.

Proper management of urban growth is a major challenge for a range of countries in Sub-Saharan Africa. For example, urban growth rates in Burkina Faso are expected to reach 35% by 2025, increasing from 23% in 2006. (Ministère de l’Économie et des Finances 2006) By 2050, it is expected that two-thirds of the global population, or 8.5 billion people, will live in cities, triggering enormous challenges for resource efficiency and the provision of basic services and health. (WHO 2012) In this context, urban growth management is an absolute necessity to ensure cities’ economic, social and environmental sustainability. Challenges with regard to job creation, limited land and other resources as well as pollution are considerable, especially in bigger cities. One of the Rio+20 goals, the “future we want” includes the development of cities with access to basic services, energy, housing and transportation, as well as economic opportunities for all. (WHO 2012) The development of sustainable cities bears a major impact on health, a WHO expert consultation found that, while cities concentrate major opportunities for jobs, skills development and development, they also pose major health risks and hazards. (WHO 2012)

Of the three countries analysed, Rwanda is the only one that has currently put the concept of sustainable cities into practice. The Ministry of Local Government, in partnership with other line ministries, is working on the construction of model-integrated development projects in two pilot cities (Rubaya and Kayonza), which include concepts such as water harvesting, biodigesters and solar power. Another project developed as part of the Green Growth Framework in Rwanda is the conversion of the Kigali metropolitan area to a Green City. Aspects that have already been implemented include sustainable planning, incorporating urban design that efficiently utilises the hilly landscape of Kigali, in combination with green areas that provide open space and improved quality of life for residents, protect its wetlands, and manage water runoff. The latter include the transfer of an old industrial part to a new area, as well as a general ban on construction in wetlands. Job creation is expected, especially through construction of the site, as well as through attracting sustainable investment that will create jobs and attract new industries to the industrial area. The Government of Rwanda accompanies this development with programmes related to affordable

**Box 7: Health and Sustainable Cities**

While cities concentrate opportunities, jobs and services, they also concentrate health hazards and risks. Health is an important benchmark of urban policies’ sustainability. Health indicators proposed by the WTO expert group reflect progress on social equity, the environment and development aspects of sustainable cities. They include slum housing improvements that benefit health, as well as access to clean energy, climate-adapted structures and basic utilities; improved air quality with regard to air pollution, healthy efficient transport including pollution, as well as safety aspects; the use of sustainable means of transport and the reduction of urban violence. As regards the government, WHO experts propose measuring how cities account for health in urban planning and building codes. Other governance indicators should include the monitoring and enforcement of air/water quality, as well as access to basic urban services, such as healthcare or waste management. (WHO 2012)
housing, e-governance and urban agriculture, thereby integrating aspects of HCD into the sustainable-city approach. One successfully implemented aspect has been the ban on plastic bags (see Box 8), which has now also been approved in Burkina Faso.

Major challenges concerning sustainable cities have been described with regard to other infrastructure-related challenges, including construction, water and sanitation. In Zambia, another challenge that emerged was the understanding of the concept itself. While certain aspects of sustainable cities, especially in terms of providing access to basic services are actively tackled, there was an overall question regarding the scope and relevance of the concept.

Sustainable Transport:
Urban transport systems also exert an impact on Green Growth, job creation, as well as health. Cities are facing major challenges with regard to the development of appropriate infrastructure and transport systems to cope with the needs of a growing population. Public transport in African cities is largely dominated by informal minibuses, as public services are unable to meet the existing demand. A study conducted in 2008 showed that, on average, there are only six bus seats available for 1,000 residents. (UBA 2013) This situation affects the poor in particular, who have to opt for non-motorised transport in areas that are ill-equipped for it. This situation severely affects human development in the sense that the absence of adequate transport hinders access to jobs and basic services for large swathes of the population. (UBA 2013) UN-Habitat is implementing a programme on Sustainable Transport Solutions in East African Cities, including the development of Bus Rapid Transit and Infrastructure and Traffic Demand Management. In South Africa, entrepreneurs have taken matters into their own hands, developing applications that help consumers to better plan their public transport experience through mobile applications. Both GoMetro, as well as Aftarobot, have been built around an existing gap of reliable information on public transport and are focusing on: (i) the metro and railway system in South Africa, as well as (ii) the development of services to improve the reliability of private minibus companies, while simultaneously creating jobs and reducing the vulnerability of women, who do not have to wait long hours at deserted bus or train stations any longer. (InfoDev 2014) Of the three countries analysed, both Burkina and Rwanda are currently creating an improved urban transport system by promoting the use of public buses, which will reduce CO2 emissions, as well as congestion caused by private cars and taxis. At the same time, it will increase the poor’s access to transportation. Rwanda also has the first bus that is running on biodiesel in Africa. The biodiesel is produced locally from Jatropha and Moringa trees, as well as animal fat. It is currently still produced by the Institute of Scientific and Technological Research. However, the Ministry of Forestry and Mines is planning to have local farmers plant Jatropha and Palms along the road and between paddocks as an additional source of income. (GEC 2010).
Entry Points for Human Capital Development:

Improve infrastructure and access to basic services in cities.
Job creation potential, in areas ranging from waste management to the provision of water or sustainable transport.
Support in the development of more sustainable transport technologies (infrastructure, as well as business models) that provide people from areas with poor access with access to jobs and healthcare.
Skills development programmes for urban planners and city governments to address the challenges of sustainable cities.

Impacts on health: Cities concentrate health risks, including air pollution. More sustainable city planning will reduce these risks.

3.3. Green Growth and Human Capital Development and Natural Resource Management

Natural resources, especially land, soil, water, forests, renewable energy resources and ecosystem services are fundamental to improving livelihoods and achieving sustainable development in Africa. The Bank’s Ten-Year Strategy (2013-2022) underlines the importance of Natural Resource Management as a catalyst for transformation and promoting inclusive growth through widening access to resources, while improving efficiency and sustainability of the use of natural assets. (AFNRC 2014) The following chapter analyses the potential for using Natural Resource Management (in countries where natural resource depletion is a major challenge) as a driver for Green Growth and Human Capital Development and analyses the potential in a number of relevant sectors.

Figure 6: Natural Resource Depletion

<table>
<thead>
<tr>
<th>Country</th>
<th>Natural Resource Depletion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burkina Faso</td>
<td>7.82%</td>
</tr>
<tr>
<td>Rwanda</td>
<td>2.90%</td>
</tr>
<tr>
<td>Zambia</td>
<td>17.51%</td>
</tr>
</tbody>
</table>

Source: HDR 2014
Agriculture is the primary driver for IGG in Africa given its demographic weight, socio-economic potential and impact on the environment. Beyond the responsibility for food security, it supports the livelihoods of 80% of the population, employs 65-70% of the workforce and accounts for approximately one third of the continent’s GDP. Seventy per cent of people living in poverty work in the sector. It is highly feminised, women making up more than half of Africa’s farmers and producing up to 90% of the continent’s food. As regards to the environment, the sector also plays a key role since natural resource preservation (land, water and biodiversity) and resilience to climate change directly hinge on the choices made with regard to agricultural production methods.

Today, agriculture must face a number of challenges linked to inclusiveness and sustainability. While 90% of livelihoods are agriculture-dependent in Burkina Faso and Rwanda, and 68% in Zambia, agriculture is intrinsically linked to poverty and underemployment. The dominant form of agriculture continues to be subsistence farming, characterised by low productivity and unsustainable practices in a context of rising pressure due to demographic pressure and climate variability. This often leads to increased soil depletion (Burkina Faso and Rwanda), which exacerbates the effects of drought or floods. Regarding infrastructure, there are a number of challenges for the sector to reach its potential, including the lack of water storage capacity, inadequate energy supply, transport systems, processing and storage facilities, limited access to funding and international markets, or trade barriers that directly hamper the sector’s development. As for women, while they provide the majority of the labour in agricultural production, their access and control over productive resources is still greatly constrained due to inequalities imposed by patriarchal norms. (Doss 1999) Improved productivity and agribusiness models contribute significantly to improving food security, nutrition and poverty alleviation. A growing concern over how to promote better practices has been observed at policy level in all three countries, which have adopted

### Country Approach

**Burkina Faso:** Promotion of pro-poor value chains (cereal production, oilseed and leguminous crops, fruit and vegetables, and cotton) to reduce poverty and create jobs.

**Rwanda:** Major challenges in the areas of financing and infrastructure, when it comes to the development of pro-poor value chains.

**Zambia:** The most important strategy is Conservation Agriculture, the implementation of private-sector initiatives (COMACO) likely to be replicated on the continent.

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**Source:** WB Data System
3. Green Growth and Human Capital Development in Selected African Countries

Box 9: Partnership for Co-Development of Shea Butter

L’Occitane, a famous French cosmetics brand, has been collaborating for more than ten years with women’s cooperatives in Burkina Faso to buy transformed Shea butter (“Karité” – oleaginous seed). L’Occitane, who buys the butter three times more expensive than the local market price, has become the leading client of this product used for cosmetics. Shea butter is the third leading export product and is characterised by a female workforce (80% of women).

Box 10: Community Markets for Conservation

COMACO is a company that combines conservation and market creation based on a business-oriented approach. Through its brand “Its Wild”, it provides products at a premium price. Those premiums are brought back to the farmers supplying the raw materials in return for conservation of their land, as well as the use of conservation agriculture. COMACO is currently working with 90,000 farmers approx. The objective is to support farmers in boosting food security and generating higher incomes, while also increasing conservation, supporting reforestation and reducing poaching. Over 75 depots make market access for rural and isolated communities possible, which are now able to sell their surpluses and decrease food security. Capacity building is being implemented through radio programmes and farmer field schools and is open to all farmers in the region. Secondary effects of the programme include the surrendering of more than 2,000 firearms and just under 70,000 snares. The company is currently struggling to meet demand and increase production capacity.

4 Conservation farming = Conservation Agriculture. CA aims to reduce soil degradation through several practices that minimise the alteration of soil composition and structure and any effects upon natural biodiversity. (FAO 2001, The Economics of Conservation Agriculture. http://www.fao.org/docrep/004/y2781e/y2781e03.htm)
Another aspect that has not been widely explored in the three countries is the aspect of value addition. While in Zambia all the stakeholders interviewed defined it as one of the most important aspects for improving livelihoods and increasing farmer incomes, not many initiatives where value addition is actually working were mentioned in the interviews. The most prominent one is COMACO, with its "Its Wild" products. Another interesting case is Sylva Foods, a domestic SME aimed at raising demand for and sales of traditional Zambian foods and beverages based on an inclusive sourcing model, selling sun-dried vegetables, traditional chicken meat and canned goat (Business Innovation Facility). The development of sustainably-sourced products along the value chain, including the development of market linkages, the necessary capacity development, as well as financing opportunities, etc., is an excellent entry point where the AfDB can support agriculture in the different countries. A good example in this regard would be the partnership between L’Occitane and Shea Butter producers in Burkina Faso (see Box 9).

Support in this area would help to overcome some of the major challenges, including inadequate rural financing and a lack of infrastructure, a huge challenge in both Rwanda and Zambia.

Livestock currently contributes approximately 35% of agricultural GDP in Sub-Saharan Africa. (FAO 2005) About 70% or 150 million of the rural poor are at least partially dependent on livestock to sustain their livelihoods, and the continent has the largest area of permanent pasture. Livestock can make a major contribution to food security and is often the most important source of income in many small-holder mixed-farming systems, allowing the purchase of agricultural inputs and other family necessities. Emphasis should be placed on facilities and credit systems for small-scale producers. In Zambia, the AfDB has developed a concept of community game management and wildlife ranching that could be an interesting wildlife model, yielding additional income and conservation benefits for communities, as well as incentives for reduced poaching and more sustainable wildlife management.

Another important aspect is the development of new adapted skills and technologies through research and development. In Burkina Faso, organisations such as the National Institute of Environment and Agricultural Research (INERA) or the International Institute for Water and Environmental Engineering (2iE) have developed a number of relevant innovations, such as biofuel solutions through local oilseed, or nutritional solutions based on Shea (Karité) caterpillars. However, the creation of an ecosystem and enabling environment for the development of a new transformation industry that could provide farmers with new market opportunities still needs to be developed, and there is a significant lack of funding at this level. Agribusiness Innovation Centres, focusing on incubation in the agricultural sector, could be one way forward in this regard, promoting technology development as well as value addition.

**Entry Points for Human Capital Development:**

Conservation agriculture as one means of promoting Green Growth, while at the same time enhancing income generation for farmers.
Skills development for conservation agriculture through vocational training, as well as extension officers.
Support of private-sector business models such as COMACO and the development of inclusive value chains in agriculture.
Development of programmes to promote value addition in agriculture, for example through Agribusiness Innovation Centres, entrepreneurship programmes, etc.
Support of other innovative approaches such as organic farming that can lead to additional income generation.
Impacts on health: Direct link to food security. Agricultural decisions bear an impact on people’s health as regards hunger and malnutrition, with direct repercussions for health.

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3. Green Growth and Human Capital Development in Selected African Countries

3.3.2. Forestry

**Country Approach**

**Burkina Faso:** Readiness preparation phase for REDD+, tree planting initiative as major strategy to create jobs and reverse deforestation. However, major challenges in implementation posed.

**Rwanda:** Readiness preparation phase for REDD+; the country has reversed deforestation.

**Zambia:** Readiness preparation phase for REDD+, tree planting initiative as major strategy to create jobs and reverse deforestation. However, major challenges in implementation posed. Opportunities for Community-Based Management System initiatives created.

Forests, which account for 23% of Africa’s land area, play an essential role in climate change mitigation through carbon sequestration, biodiversity conservation, watershed protection and preservation of soil resources. They also play a significant social and economic role, especially relevant for rural communities and women. At the same time, they are under threat as Africa has suffered from drastic losses over the years, especially in the largest forests (Congo Basin and Upper Guinea). According to the FAO, the continent lost the highest percentage of tropical forests on any continent since the 1980s and the forest cover was reduced by 10% between 2000 and 2010. One contributing factor is the dependence of 90% of the population on wood as fuel for heating and cooking. Other factors include agricultural expansion, commercial harvesting, inappropriate land and tree tenure regimes, uncontrolled livestock grazing, accelerated urbanisation and industrialisation.

Deforestation implies a number of consequences, ranging from loss of biodiversity, GHG emissions (in the case of Burkina Faso, land and forest degradation account for 60% of national emissions), soil erosion and degradation of upper watersheds. In terms of health, it has been demonstrated that deforestation increases the spread of certain diseases such as malaria (Walsh J. F. 1993), while destroying plants and animals that may hold the key to treating illnesses. Human health is linked to forest health and the World Health Organization (WHO) estimates that between 23% and 25% of the global disease burden could be prevented by better management of forest resources.

The option of locally-managed reforestation and the regeneration of degraded landscapes offers opportunities to the poorest but also to society at large in a context of climate degradation. Despite representing very different contexts and realities (from 65% forest cover in Zambia to 19.5% in Rwanda or 14% in Burkina Faso), the three countries studied have understood the urgent necessity to revert deforestation rates (currently 0.5% in Burkina Faso and 4% in Zambia) and to promote sustainable forest management (SFM). All three countries have been very active in the promotion of tree planting programmes. Zambia and Burkina Faso have drawn up National Tree Planting programmes, aiming to plant between 25 million (Zambia) and 45 million (Burkina Faso) new trees in the coming years. Rwanda has achieved a positive rate of forestation, gaining 50% of its forest cover between 1990 and 2005 and the government aims to increase forest cover to 30% by 2020. However, while good programmes, implementation is slow and funds for the development of the nurseries, which would create new jobs, as well as the possibility for capacity building and training, are not available in all cases. The forestry sector has historically been

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**Box 11: Farmer-Managed Natural Regeneration — The Case of Niger**

In Niger (neighbouring Burkina Faso), rules regulating the use of trees on farms were revised in 1993, giving farmers more responsibility and stronger incentives to plant and manage trees. This approach has demonstrated its potential since, after more than two decades, over five million hectares of agricultural land are under farming systems that incorporate trees, benefiting 4.5 million people, boosting productivity, and creating thousands of rural jobs. A range of endemic species has been regenerated which have improved soil fertility, and provided fodder, wood and fuel, as well as fruit and food. In aggregate, these have diversified farmers’ incomes and boosted resilience at household level in the event of drought.
given low priority compared to more pressing issues such as food security, education or health, and therefore receives insufficient budgetary allocations in national budgets. Institutions remain too weak and practices more oriented towards unsustainable management and the use of forest resources, favouring higher and faster returns, are common. There is a strong need to provide support to the Ministries and local authorities through appropriate funding schemes and capacity-building programmes so that strategic plans can be implemented and enforced.

Another opportunity for IGG are activities related to Community-Based Management Systems. Those programmes hold strong potential for creating inclusive and sustainable employment alternatives for rural communities. For example, in Zambia there are more than 50,000 beekeepers in semi-commercial beekeeping that are using forest resources sustainably to generate additional income. The use and commercialisation of products which can be used for medical applications as well as biofuels or food supply, could be an interesting means of generating income in local communities. In Namibia, biotrade (activities involving the collection, transformation and commercialisation of goods and services derived from native biodiversity under the criteria of environmental, social and economic sustainability [UNEP – UNCTAD]) has already proven its potential and biotrade’s share of national GDP has been estimated to be around 4.5 percent. Based on a study undertaken by GIZ in 2011, biotrade provides significant potential, but it needs to be explicitly considered within international negotiations and it calls for attracting further interest of the private sector in order to be able to fully capitalise on the existing opportunities. Innovation of indigenous products, building capacity for the supply chain, as well as building markets is also fundamental. (GIZ 2012)

Sustainably managed wood plantations can provide materials for sustainable construction. Another sector estimated to create jobs, though representing a significant challenge for sustainability since it is linked to carbon emissions and contributes to deforestation when not properly managed, is charcoal production. Today it accounts for an estimated 7 million jobs in Africa and is expected to rise to 12 million by 2030. (World Bank, 2011) This growth should be accompanied by significant support for mainstreaming improved stoves and the sustainable management of wood plantations for charcoal. For further information, see chapter 4.2.1.

All three countries have committed to the REDD+ programme and are currently in the readiness preparation phase. If conducted properly, this constitutes a great opportunity to benefit from international support to lay the foundations for IGG in the forestry sector.

Box 12: Biotrade of Southern Africa

The phytotrade organisation in South Africa, for example, represents producers from seven Southern African countries promoting sustainable development, protecting biodiversity and developing economic opportunities. The natural products are grown in the wild by rural producers and include beverages, cosmetics, oils, healthcare products, herbal teas, jams and medicinal products. Companies associated with the organisation employ more than 500 people and are working with more than 15,000 rural producers, of which 60% are women. (PhytoTrade Africa)

Entry Points for Human Capital Development:

Support in value chain development, especially with regard to biotrade and other value-added activities, since they can increase income and create sustainable livelihoods.

Develop programmes related to Community-Based Natural Resource Management to improve communities’ livelihoods in a sustainable manner.

Development of programmes with regard to skills development, especially for government agencies to promote community-based management systems and reduce deforestation.

Promote research in medical plants available in forests in Africa.

Impacts on health: Deforestation is directly linked to the spread of diseases and the potential extinction of medical plants.
3. Green Growth and Human Capital Development in Selected African Countries

3.3.3. Tourism

Country Approach

**Burkina Faso:** Potential for job creation and the promotion of entrepreneurship through tourism.

**Rwanda:** Development of sustainable tourism initiatives with positive impacts on biodiversity conservation, especially with regard to CBNRM and gorilla tourism.

**Zambia:** Special focus on sustainable tourism in the national tourism policy with a special focus on CBNRM activities. First successful initiatives with regard to partnerships between communities and private lodge investors that could be replicated in other countries.

Based on information from the World Tourism Organization, the economic potential of tourism, especially with regard to employment, is enormous. In Africa alone, travel and tourism generated 8.2 million direct jobs in 2012 and most tourists are international tourists from outside Africa. (UNWTO) While growing at a fast pace, the tourism industry in Africa is still relatively underdeveloped and its future development depends on better infrastructure, open borders and improved marketing to create niche sectors for adventure and eco-travellers. (AIDB 2014) The latter provides widespread potential for Green Growth, as it creates jobs and lifts local communities out of poverty. It can also tackle existing challenges with regard to poaching and illegal hunting. One important aspect to be taken into account is in how far the benefits of ecotourism (which is where most of the revenue and benefits are to be generated), can be combined with the concept of community-based tourism.

To tap into this potential, Zambia is currently reviewing its tourism policy, with a special focus on sustainable tourism and the development of more remote areas. Tourism is considered one of the major growth sectors with regard to job creation, and 300,000 potential jobs are expected to be created in the coming years. To this end, the country needs to attract investment to be able to develop the necessary infrastructure and access to tourism sights.

Rwanda has developed a Sustainable Tourism Master Plan and has successfully leveraged the potential of conserving its biodiversity while also promoting tourism. The best-known example is the case of gorilla tourism in the country. Local communities receive 5% of all revenue generated through gorilla tourism, and the funds are invested in community projects that range from environmental protection to education and access to basic services.

A good example for community-based tourism in Zambia is the Ngoma Safari Lodge, a five-star luxury resort in the area of the Chobe National Park. The lodge is being developed in partnership between the Chobe community and Muchenje Safaris (a private tour operator). The community owns the land and the lodge, and Muchenje pays an annual rental fee, as well as a percentage of the lodge’s revenue to the community. In return, the community has set aside

**Box 13: Community Funds from Gorilla Tourism Revenue**

The Rwandan Government has established a policy that supports local communities in the areas surrounding national parks through the revenue generated from gorilla tourism. Local communities are integrated through calls for proposals and projects that are chosen based on the district level. Selection criteria include the effects on biodiversity, as well as on the local community. Communities with more incidents and conflicts with the natural park will be rated higher, based on an index developed by the park rangers. Projects that are being supported are mostly related to Human Capital Development and can range from education to skills development in agriculture or the development of handicraft products. A luxury lodge, fully owned by the community, has also been built using revenue from the fund. Here people benefit by way of revenue sharing, employment and the supply of goods and services. (Nielsen 2010)
land for conservation and there is an incentive to preserve the area’s wildlife and land. (African Wildlife Foundation) Similar examples exist in Namibia and Botswana, which are well known for their innovative approaches towards tourism.

However, besides these fine examples, generally speaking, communities are contracted for low-income jobs at the lodges. Skills development in the hospitality industry is a major challenge to be able to increase local community participation in Zambia and other countries. In Zambia, there is currently only one vocational school with a track record of training in the hospitality industry (HTTI – Hospitality Tourism Training Institute) and further capacities would be necessary to professionalise the local tourism industry. Another potential entry point for GG and HCD is the development of traditional crafts and handicrafts. Quality standards, as well as skills with regard to marketing, market linkages etc., are lacking. The same applies to Burkina Faso, where the government is developing the cultural and tourism potential in a joint strategy. Today, Burkina Faso holds a series of international events (crafts fair, puppet theatre festivals, theatre for development, masks, jazz, hip hop, etc.) which represent tangible opportunities for artists and cultural and tourism entrepreneurs to develop their activities. Cultural industries (not limited to tourism) account for an estimated 2% of GDP and generate 164,592 direct jobs.

**Box 14: The Potential of the Culture Industry in Burkina Faso: The Case of FESPACO**

The Pan-African Film and Television Festival of Ouagadougou (FESPACO) is the largest film festival in Africa and one of the continent’s biggest cultural events. Held biennially, this showcase for African cinema attracts artists from across the entire continent and professionals from all over the world, contributing significantly to the development of Africa’s film industry and consequent employment creation. It also generates 450 direct jobs and bears a strong impact on the national tourism industry.

The human impact of cultural activities is very significant as it plays an important role in strengthening national identity and promoting sustainable development through traditional values, local knowledge and women’s social empowerment. The focus should be placed on valuing national heritage and cultural diversity, strengthening skills development through education and vocational training among the sector’s various stakeholders.

**Entry Points for Human Capital Development:**

Skills development programme to provide opportunities for local communities with skilled jobs.
Support in the development of tourism models that integrate local communities as shareholders and equal partners.
Development of inclusive business models for the tourism supply chain.
3. Green Growth and Human Capital Development in Selected African Countries

3.3.4. Mining

Country Approach

Burkina Faso: Need to work with informal mining that poses major challenges to the environment as well as to its workers.

Rwanda: Focus on Climate Compatible Mining, including energy and water efficiency, and expanding upon capacity building with new skills development.

Zambia: Small pockets of activities related to environmental management in mines. Strong need to link socio-economic benefits to mining.

Africa is endowed with abundant pools of mineral resources: out of 46 countries in Sub-Saharan Africa, 19 have considerable reserves of hydrocarbons, oil, gas, coal or minerals, and 13 are in the process of exploring additional reserves. (UNDP 2014) In Burkina Faso for example, gold production represents 43% of national exports and, in Zambia, copper accounts for 85% of the country’s exports.

Nevertheless, when it comes to Africa, those abundant resources often seem to fail to create jobs and benefit local communities. Extractive activities are linked to a series of challenges such as environmental degradation, water contamination, and limited participation by marginalised groups such as women, minorities and young people, as well as conflict over land and resources. People refer to the “resource curse”, as resource-rich countries tend to perform worse in terms of development than other countries. However, this curse is not a fatality and the extractive sector, thriving in Africa today, is increasingly regarded as a sector with real potential for bringing IGG to fruition if properly managed with the right mix of policies and enforcement systems in place. It is expected to trigger growth in new and dynamic economic sectors and industries, as well as investment in jobs, infrastructure and basic social services.

Countries like Botswana are examples of how to successfully leverage mineral wealth to achieve strong development outcomes in many areas (IEDS). Despite being a small and landlocked country, Botswana, through appropriate economic, fiscal and social policy, managed to uphold one of the highest growth rates in the world and to achieve good development indices (the country ranks 119 in the HDI, among the medium development countries), largely due to its mineral sector (diamonds). Benefits were reinvested through public investment campaigns in productive and social infrastructure (such as education and health).

In Zambia, it will be important to maximise the socio-economic benefits of the mining sector, which would lead to improved value addition, safety, health and environmental standards. While currently not mainstreamed, relevant studies and reports show that there are pockets of activity related to Green Growth in the mining sector, which include the development of smelting standards or the reduction of sulphur dioxide (implemented by Mopane mines). (Banda 2013) In addition, ZESCO is actively working with the mining industry in the area of demand-side management and energy efficiency. Based on an interview with a UNCTAD representative, the mining industry is also actively involved in the ILO’s Green Jobs programme, with which they have signed memorandums of understanding for the sustainable construction of housing provided by the mines.

However, besides these positive examples, the social gaps, as well as environmental impacts are very significant. The development of industrial extractive activities is usually linked with the emergence of the informal sector, like in Burkina Faso where interviewees repeatedly mentioned a “gold rush” phenomenon. This generally implies a number of issues including child labour, prostitution, internal migration, etc. For example, according to a 2010 study conducted by UNICEF and the government of Burkina Faso, almost 20,000 children were found to be working in artisanal gold-mining sites in Burkina Faso, and more than 80% of them had never been to school. In this context, there is still a lack of initiatives, apart from isolated projects like the UNIDO programme on reducing the impact of artisanal gold mining on health and the environment in Ghana.
Achieving Inclusive Green Growth in the sector will imply a number of reforms at economic, fiscal and political level with the participation of all the stakeholders. In that sense, the African Union and the UN Economic Commission for Africa (UNECA) have developed the African Mining Vision 2050, which sets out a number of ideas for increasing the resource wealth flowing to the nations that host mining operations. Through the recent creation of the African Minerals Development Centre (AMDC), in partnership with the AIIDB, UNDP and the Economic Commission for Africa (UNECA), the African Union Commission (AUC) in Addis Ababa seeks to help implement this vision and progressively build appropriate enabling environments to optimise the socio-economic benefits of the mining sector, leading to improved value addition, safety, health and environmental standards. Another initiative is the pilot developed at a global level by UNICEF to engage the private extractive sector into children’s rights, which will lead to a specific strategy for engaging the extractive private sector.

Africa is a vulnerability hotspot when it comes to climate change, whose expected effects for the continent include changes in rain patterns and a higher incidence of weather and climate-related disasters, general rise in the frequency of droughts and flooding, as well as other natural disasters. (UNEP 2014) In light of its higher vulnerability and lower adaptive capacity, the continent is expected to be more affected than any other region of the world, and the associated costs will disproportionately affect the poorest households as they are directly dependent on natural resources. Estimates indicate that climate change reduces the GDP growth rate by 0.4% every year in Zambia and 0.5% in Burkina Faso, leading to overall costs of 4.3 billion USD and 3.8 billion USD, respectively. (MLNER 2011 and CONEDD 2011) In the case of Rwanda, additional net economic costs could be equivalent to a loss of almost 1% of GDP every year by 2030. (Stockholm Environment Institute 2009)

Climate change is likely to affect human health, either directly or indirectly. Impacts include the increased incidence of mortality or morbidity linked to events such as flood or drought, but also indirect effects such as malaria, diarrhoea, schistosomiasis, undernourishment and malnutrition. (UNEP 2006) In Rwanda, it is believed that recent temperature trends may have shifted the altitudinal pattern of malaria and raised the national malaria burden. (Stockholm Environment Institute 2009) When it comes to gender, women are more vulnerable, and the impact on their livelihood is greater as they are more dependent on natural capital. In Burkina Faso, like in a number of other African countries, drought implies increased workload (more time looking for water or wood) and undernourishment (reduction of the amount of food in favour of the family) for women while girls are often taken out from school so that they can go and look for water.
To overcome these challenges, adaptation strategies and measures to build resilience are being put in place all over the continent. In the three countries studied, national adaptation programmes of action (NAPAs) identify priorities that respond to the most urgent and immediate needs to adapt to climate change. Prioritised sectors include water, agriculture, livestock and forests/biodiversity in Burkina Faso; agriculture, tourism, infrastructure, health, forestry, water and energy in Zambia; and land conservation against erosion and floods, hydrometeorological information, irrigation or woody combustible substitution in Rwanda. The drawing up of NAPAs serves as a springboard for climate change adaptation projects and allows countries to acquire funding and technical support from the international community. For instance, in 2010, Rwanda was engaged in establishing early warning and disaster preparedness systems and integrated watershed management in flood-prone areas with the support of the Least Developed Countries Fund (LDCF). Achievements included the rehabilitation of more than 1,000 ha of degraded land, the construction of grade terraces for erosion control, the creation of training modules in the national language, tree planting and developing alternative livelihood options for the local communities as adaptation measures (UNDP 2014), among others. In Burkina Faso, the country prioritised strengthening national capacities, strategic planning and climate change adaptation pilot projects with the support of a number of international funds that it managed to obtain. Some noteworthy results include the reduction of vulnerability through support for meteorological stations or the recovery of degraded lands. In the case of Zambia, relevant achievements include strengthening institutions in policy formulation, articulation and advocacy at government level or the promotion of a series of projects such as rainwater collection or conservation agriculture.

There are a number of gaps to be bridged in terms of human capital development for supporting proper resilience in Africa. For instance, there is an immense need for capacity building – in universities, government departments, local authorities – for data modelling and interpretation, to understand climate interactions, e.g. with water, biodiversity, and so forth. The nature of these interactions is usually not known and countries have to contract the relevant expertise from abroad. Decentralisation efforts should also be made right down to the lowest administrative units, as efforts are all too often concentrated on government level. Rwanda in particular has noted the lack of existing data and research (with regard to projections, as well as to future health impacts) and has integrated the topic into its Green Growth Strategy.

Another concern is about gender as climate change adaptation practices are aimed more at men than at women. For example, in Burkina Faso, 67% of the projects benefit men in particular, while the remaining 33% are beneficial to both men and women. (Oxfam 2011) The private sector could also play a significant role in resilience, especially when it comes to the development of safety nets. Examples such as the development of weather-index-based insurance products that are used in Rwanda can be one good example to decrease the impact that climate change bears on smallholder farmers. By 2013, through a partnership with a rural microfinance institution, SORAS (a Rwandan insurance company) and Swiss Re Corporate Solutions, more than 100,000 farmers were provided with their first insurance, and first payments to farmers were made in 2012. A major challenge when it comes to weather-index-based insurance products is data availability. Satellite-based indexes are generally the best available option. Also in Zambia, the IFC identified a series of investment opportunities to help smallholders in their adaptation measures, including a mobile platform for disseminating market and climate information, weather, microfinance products, index-based insurance products or general innovation in agriculture technology. (IFC 2012)

6 A type of insurance provided to the farmer against any adverse climatic conditions. A farmer could be paid, for instance, whenever rainfall or the temperature is so high or so low that it is likely to cause lower crop yields, or whenever droughts, frost, or high humidity cross specific thresholds. (http://www.rocketellerfoundation.org/uploads/files/9a111989a-175b-4b85-82e6-2f6780f2a-jaan_18-10-01.pdf)
4. Linking Health to Green Growth and Human Capital Development

Arne Hoel / World Bank
Although health is an essential component of human capital development and is central to green growth, an important finding of this study is the lack of linkages generally established between health, GG and HCD at policy and strategic level. Specific approaches integrating health in GG and HCD have been noticeably lacking in the three countries studied. This situation reveals the lack of awareness and knowledge about those linkages at all levels and the need to develop specific programmes aimed at bridging this gap. Improved health is intrinsically linked to improved human capital, i.e. labour productivity (Total Factor Productivity) and is therefore an enabling factor for improved green growth. The AfDB could play a crucial role in developing specific analysis frameworks and data collection systems, highlighting those linkages and laying the foundations for proper policy-making integrating health. Furthermore, the development of a comprehensive approach as a sector priority addressing health infrastructure (physical infrastructure such as hospitals, health information, etc.) seems strategic to the Bank. The following table presents a brief overview of issues and entry points linking health, GG and HCD identified over the course of this study and could represent a good basis for further development.
4. Linking Health to Green Growth and Human Capital Development

**Issues**

<table>
<thead>
<tr>
<th>INFRASTRUCTURE</th>
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<tr>
<td><strong>ENERGY</strong></td>
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<tr>
<td>Lack of access to electricity prevents medical centres from using advanced equipment and jeopardises the storage of vaccinations or necessary medication, Health problems linked to the use of inefficient cooking stoves.</td>
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**Entry Points**

- **Funding to improve access to water and sanitation projects and initiatives, e.g., funding of simple water-treatment technologies that filter drinking water.**
- **M&E systems highlighting the impact of cities on health (air, water, access to health services, etc.) for urban planning and building codes. Support for sustainable transport (infrastructure and business models).**

**M&E**

- **Data collection: Fostering data collection, thereby highlighting and monitoring the links between GG and Health, creating the necessary basis for policy-making.**

**HUMAN CAPITAL STRATEGY**

- **Skills and technology for competitiveness and jobs: Support for the development of appropriate skills in all sectors linking GG and health.**
4. Linking Health to Green Growth and Human Capital Development

Figure 9: Overview of the Links between Health, Green Growth and Human Capital Development

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<thead>
<tr>
<th>NATURAL RESOURCE MANAGEMENT</th>
<th>BUILDING RESILIENCE</th>
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<tr>
<td>AGRICULTURE</td>
<td>MINING</td>
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<tr>
<td>Food security: malnutrition, undernourishment, food crises exert a direct impact on health, especially on children.</td>
<td>Air, soil, water and visual pollution that directly affect people’s health. Indirect effects include HIV/AIDS (prostitution), and diseases linked to poor hygiene conditions in the informal sector.</td>
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<td>Support for the development of appropriate policies that guarantee food security and proper nutrition while ensuring incomes for the poorest.</td>
<td>Climate change impacts include mortality linked to events such as floods or droughts, and indirect effects such as malaria, diarrhoea, schistosomiasis, undernourishment and malnutrition.</td>
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<tr>
<td>FORESTRY</td>
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<tr>
<td>Deforestation directly linked to the spread of certain diseases such as malaria, while destroying plants and animals that may hold the key to treating illnesses.</td>
<td>Support in the development of safety, health and environmental standards. Fostering cross-sector partnerships among all stakeholders.</td>
</tr>
<tr>
<td>Improved management of forest resources. Biotrade as an option for promoting sustainable development, protecting biodiversity and developing economic opportunities.</td>
<td>Support for the development and implementation of proper national adaptation programmes of action that identify priorities that respond to the most urgent and immediate needs.</td>
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<td>BUILDING RESILIENCE</td>
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**Efficient and inclusive service delivery:** Strengthening voices and accountability for health-related problems, support for increasing value for money in social service delivery in the health sector, support for partnerships with the private sector.

**Inclusive financial and social systems:** Social risk mitigation mechanisms. Micro-insurance programmes, including health insurance and weather-based insurance.
5. Towards an Inclusive and Green Economy in Sub-Saharan Africa
Integrating Human Capital Development into Green Growth strategies offers opportunities for the region in general, and for the AIDB in particular. There is potential to develop a flourishing ecosystem that generates employment and enhances the use of natural resources in a sustainable and productive manner. However, as it has been noted, on the one hand, the three countries studied are from different regions and, on the other hand, they are at different stages with regard to the implementation of Green Growth. Human Capital Development needs in the three countries, as well as the potential for the AIDB to support Human Capital Development, therefore differ and should be adapted according to local specificities and national needs.

Given this context, a series of actions are put forward to help the AIDB promote programmes and enhance the Green Growth agenda through Human Capital Development in the region.

Figure 10: Skills Development and Capacity-Building Interventions as per the Stage of Integration of GG in a Country
Action One: Build Capacities and Strengthen Institutions for GG

While all countries need further skills development at national level, the level of awareness in the different countries differs considerably. In Rwanda, Green Growth is a government priority on all levels and is well-defined. Zambia is on its way to defining its own IGG strategy, while Burkina Faso is in an incipient phase of Green Growth.

Interventions with regard to Green Growth and Human Capital Development in Rwanda will have to be scoped differently to those in Zambia and Burkina Faso. While overall the challenge is the same, i.e. the lack of knowledge on how to render GG operational at national level and how to break it down into the different sectors, the level of intervention needs to be different.

Recommendations:

- Provide support in skills building for the public sector, especially in green growth concepts and management skills, to increase the capacity to implement strategies adopted at strategic level. Support decentralisation processes that create skills and capacities at regional and local level and foster implementation of IGG in the country. Develop a skills needs assessment to identify the gaps for the implementation of GG policies and strategies.
- In Burkina Faso, promote awareness-raising and capacity building with regard to the benefits and advantages of Green Growth. Support the development of a national long-term vision for Inclusive Green Growth and propose the creation of scoping workshops to provide assistance in designing a country-wide strategy.
- Support Rwanda in prioritising the specific areas of intervention, the strategic sector policies and in rendering Green Growth operational through capacity building and skills development for those responsible for implementing the EDSP II on the sectoral and local level. This includes policy development, national planning, monitoring and evaluation, as well as how to mainstream Green Growth across all areas.

- In Zambia, support the development of the IGG framework though capacity building, skills development and facilitation of the IGG strategy development.
- Within the AIDB, sector professionals should be supported on how to integrate and mainstream Green Growth into their day-to-day work in the countries.
- Moreover, the AIDB can play a critical role in assisting countries in identifying where they stand vis-à-vis Green Growth (Figure 9) and advising countries on how to formulate Green Growth strategies and to define priority areas, skills development and capacity-building interventions to focus on, based on the assessment of their current status.

Action Two: Enhance Skills and Capacity-Building Programmes for GG and HCD

Adequate skills and capacities are a major challenge on all levels, ranging from technical skills for implementation to experience with the implementation of IGG strategies at government level. Capacities on how to turn GG strategies into action are a challenge; the need to further capacity building was noted in all three countries. With regard to implementation, practical skills and training on subjects linked to Green Growth such as clean energy, sustainable construction, etc., are lacking and barely integrated into educational (academic and vocational) curricula. Zambia can serve as an example for all three countries, where the government intends to prioritise the development of new vocational training centres. It encourages private investment to bridge the gap in a vocational training system that can only absorb roughly 5% of young people entering the labour market every year (Zambia Development Agency 2011), as the system suffers outdated infrastructure and lacks money for investment. Another recurring issue in all three countries is a lack of skills, especially in new sectors. Vocational training centres are scarce and unadapted to new technologies, sectors or, in the case of agriculture, even new planting methods. Studies that analyse the efficiency of the current vocational

*See for example: World Bank 2013, Zambia’s Jobs Challenge: Realities on the Ground.*
training system do not exist and there is no information on the potential impacts of greater investment in vocational training and education. To ensure that skills development and capacity building yield the desired effect, a long-term approach aligned with the objectives of the Green Growth strategy would need to be pursued.

**Recommendations:**

- Analyse the efficiency of the current vocational training system in all three countries and develop a sector gap analysis as regards vocational training and skills development in sectors relevant for Green Growth, especially in areas such as renewable energy and conservation agriculture. This will make the existing supply more relevant and facilitate the matching of demand and supply with skills in a given country. Support for vocational training systems should also include investment in infrastructure and equipment, as well as a long-term plan on how such investment can bear an impact on the quality of vocational training and education systems.
- While renewable energy and agriculture have been defined as relevant sectors in all countries, the need for more tourism-related training was especially identified in the case of Zambia.
- Support programmes focusing specifically on building skills in the informal sector. Conservation agriculture or Community-Based Management Systems are relevant areas to be promoted. This includes support in the development of the necessary frameworks and conditions. By way of example, in the tourism sector in Zambia and Rwanda, a shift from communities being mere spectators and performing simple jobs to being active players in the industry is necessary.
- Create a full range of skills training by mainstreaming green growth components (agriculture, forestry, construction, energy, water and sanitation, etc.) within the New Education Model in Africa, with a special emphasis on engineering.
- Support Science, Technology and Innovation (STI) with a special focus on research and investigation, especially in agriculture and energy. Innovations with regard to endemic species, traditional techniques and knowledge are especially appropriate. This should be accompanied by financial and technical support for existing universities and research centres in partnership with international universities.
- Strengthen efforts to systematically integrate local communities and empower their participation in Green Growth programmes. At this level, fostering bottom-up dialogue and participative processes are relevant as a means of strengthening governance.
- Increase the participation of women in skills and capacity-building programmes. A rise in the female enrolment rate leads not only to women’s empowerment, but also to a reduction in child mortality and other related factors.
- To overcome challenges with regard to implementation, analyse the results and pitfalls of all existing AfDB educational programmes and their results in order to define successful programme approaches that could be replicated in the area of Green Growth.

**Action Three: Integrate the Private Sector in Promoting a Green and Inclusive Economy**

The private sector has a key role to play in expanding Human Capital Development in Green Growth relevant areas. Many of the aspects that have been touched upon can only be successful if a sound private sector that is focused on job creation, innovation and sustainable natural resource management is in place. This includes actors ranging from small-scale entrepreneurs to big corporations. To this end, an enabling framework that fosters green and inclusive private-sector development needs to be in place, engaging local communities as equal partners rather than as programme beneficiaries. As these are relatively new areas of intervention, governments need advice on how to develop the necessary frameworks, which is where the AfDB, with its potential to support the development of an enabling environment, could provide significant added value.
Recommendations:
- Support the involvement of the private sector, providing solutions for social services aimed at increasing resilience and inclusive markets through innovative technologies such as ICT or agribusiness. Potential intervention could range from the support of incubation centres to financing or entrepreneurship programmes. A clear strategy on how to attract the interest and innovation potential of the local entrepreneurial community as well as foreign direct investment is key.
- Support the creation of private-sector approaches and investment, as well as the development of appropriate enabling conditions, including the legal and regulatory framework, as well as access to necessary data such as weather forecasts and satellite data.
- Support the development of support schemes to encourage corporations to initiate traineeship programmes for young graduates and/or unskilled workers. This can reduce the skills gap and cut unemployment.
- A framework for the development of joint venture and partnership approaches between communities and the private sector is critical in this transformation. Examples that can be used include the existing model for CBNRM in Namibia. In Zambia particularly, but also in Rwanda, supporting the development of a similar framework, creating clear rules for community-based natural resource management, would be critical.

Action Four: Enhance Entrepreneurship and Inclusive Business for HCD and GG
In all countries, the entrepreneurship culture and the development of inclusive and innovative business models is still in an incipient phase. While cases of entrepreneurship and social and inclusive business can be found, the necessary ecosystems as well as the support services required (such as incubation centres, innovation hubs, access to finance, etc.) are not strongly developed. The AfDB could support all three governments through systematically identifying gaps in the enabling ecosystem and by supporting the establishment of a more innovation-led culture. Moreover, successful experiences from countries with an existing ecosystem for entrepreneurship such as Kenya or South Africa should be documented systematically to gain a better understanding of how to transform societies and veer them towards innovation.

Recommendations:
- Create innovative funding for promoting renewable energies, African crops and new manufactured products based on local natural resources. It should be accompanied by entrepreneurship programmes in the areas with greatest potential (agribusiness, ICT, etc.) as well as the creation of links to regional and global markets.
- Strengthen the work on social risk mitigation mechanisms in the form of micro-insurance programmes such as weather-based insurance, health insurance and crops insurance in order to enhance social innovation and entrepreneurship.

Action Five: Development of Green and Inclusive Value Chains
Market linkages and the development of green and inclusive value chains were a major challenge in all three countries. A number of promising initiatives such as the development of Green Construction in Zambia exist, but there is a general lack of developing value-added products in relevant value chains, such as agriculture, biotrade or tourism.

The AfDB should support the government as well as actors from the private sector in the development of inclusive and green value chains, including support for Business Development Services, access to finance, skills development, the development of market linkages and the provision of climate resilient infrastructure.

Recommendations:
- Develop value chain approaches and the creation of an adapted transformation industry that work with local raw materials and natural resources. Efforts should be channelled into creating an enabling environment for conducting business and innovating, fostering an
entrepreneurship mindset, and accompanying newly-established companies in their first years of activity.

· Support the specific countries, developing support for the tourism industry in Zambia, support for agricultural value chains in Burkina Faso, and support for sustainable construction in Rwanda, as promising sectors where the development of green and inclusive value chains could lead to Green Growth and improved Human Capital Development.

· Adaptation to climate change is one major challenge, especially when it comes to the resilience of poor communities. The first attempts to create safety nets for local communities, through micro-insurance for example, are good entry points. The focus on Inclusive Green Growth may represent an opportunity to develop more resilient communities, while at the same time creating opportunities linked to agricultural value chains in particular.

· As information asymmetry and lack of access to information hinders new ideas entering the market, government or other actors can provide relevant information to the different actors, as well as provide fora, such as incubation centres, investment fora, etc., to bring actors and investors together.

**Action Six: Data Collection and Analysis for Improved Resilience**

The non-existence of data and expertise related to climate change, as well as the associated impacts on health remains a major challenge. Research as well as investment in data collection (for projections, health-related aspects, but also data for the analysis of weather patterns), especially at regional and local level, are necessary in all countries. While Rwanda has already placed the issue at the heart of its Green Growth Strategy, the other two countries are currently not active in this area. Only if the effects of climate change, the change in weather patterns and the effects on health can be successfully measured, can Green Growth strategies, as well as adaptation strategies and hence possibilities to improve human capital, take effect. The AfDB would be in a good position to finance and
develop data-collection strategies as well as to support the development of partnerships between countries, as data collection calls for time and resources. The AfDB could also support matchmaking between institutions with experience in data collection and analysis and government actors; alternatively the AfDB could provide training on data collection and analysis.

**Recommendations:**

· In Zambia and Burkina Faso, develop climate data collection points in the relevant countries to be able to develop local projections with regard to climate change and the change in weather patterns.

· Connect data collection to products such as weather-index-based insurance, health centres and disease research.

· Support countries’ capacity building in terms of data collection as well as the initiation of specific activities between country offices and governments to regularly collect data. This will not only help the government in evidence-based policy-making but will also assist the Bank in its project design.

**Action Seven: Monitoring and Evaluation of Green Growth Interventions**

As interventions with regard to Green Growth and Human Capital Development are relatively new, Monitoring and Evaluation of all activities should be an essential component of any activity undertaken. Without a proper evaluation, it will be hard to foresee which of the interventions are producing impacts, as well as help identify those interventions that are cost-effective and worth expanding or replicating.


AfDB 2013 c): “African Countries and Climate Change: Changing the Development Trajectory; Third Conference on Climate Change and Development in Africa (CCDA-III)”, 2013


AfDB et al. 2013: “A Toolkit of Policy Options to Support Inclusive Green Growth”, AfDB; OECD; UN; World Bank, 2013


Hanushek, Eric: “Economic Growth in Developing Countries: The Role of Human Capital”, Stanford University, 2013
IMF 2004: “Social Spending, Human Capital and Growth in Developing Countries: Implications for Achieving MDGs”, IMF, 2004
UNESCO 2010: “Water and Traditional Knowledge” UNESCO, 2010
WWF: “The Contribution of Protected Areas to Human Health”, WWF and Equilibrium Research, 2010
A set of indicators has been established for analysis in the three selected countries and can be found in Figure 1. The proposed indicators for this framework can be divided into Green Growth and Inclusive Growth indicators. They were chosen according to their relevance to the country context, as well as to reflect all the relevant dimensions of Green and Inclusive Growth, including issues such as poverty and inequality, access to basic services, access to opportunities, natural resource management and natural resource depletion. The table seeks to be illustrative but not exhaustive, and helps to provide a first overview of the status of Human Capital Development and Green Growth in the countries studied.\(^9\)

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<table>
<thead>
<tr>
<th>Inclusive Growth Indicators</th>
<th>Burkina Faso</th>
<th>Rwanda</th>
<th>Zambia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Poverty and Inequality</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population Living Below the Poverty Line (%)</td>
<td>44.6%</td>
<td>63.17%</td>
<td>74.45%</td>
</tr>
<tr>
<td>Income Inequality (Gini index)</td>
<td>39.79%</td>
<td>46.8%</td>
<td>50.82%</td>
</tr>
<tr>
<td>Adult Literacy Rate</td>
<td>28.7%</td>
<td>65.9%</td>
<td>61.4%</td>
</tr>
<tr>
<td>% of People Working in the Informal Sector</td>
<td>N/A</td>
<td>94%</td>
<td>89% (Female: 94%)</td>
</tr>
<tr>
<td><strong>Access to Basic Services</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to Improved Water Source (% of Population, 2011)</td>
<td>76%</td>
<td>71%</td>
<td>63%</td>
</tr>
<tr>
<td>Access to Improved Sanitation Facilities (% of Population, 2011)</td>
<td>19%</td>
<td>61.3%</td>
<td>42.1%</td>
</tr>
<tr>
<td>Access to Electricity (% of Population, 2010)</td>
<td>13.1%</td>
<td>16%</td>
<td>18.5%</td>
</tr>
<tr>
<td>Under-Five Mortality Rate</td>
<td>102.4 per 1,000 births</td>
<td>55 per 1,000 births</td>
<td>89 per 1,000 births</td>
</tr>
<tr>
<td>Public-Sector Spending on Health As a % of GDP</td>
<td>3.4%</td>
<td>6.1%</td>
<td>4.2%</td>
</tr>
<tr>
<td><strong>Access to Opportunities</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enrolment in Education (Post-Secondary)</td>
<td>N/A</td>
<td>N/A</td>
<td>8%</td>
</tr>
<tr>
<td>Women’s Participation in the Labour Market Female Labour Force Participation Rate (% of Female Population, age 15+)</td>
<td>77%</td>
<td>87%</td>
<td>73%</td>
</tr>
<tr>
<td><strong>Natural Assets Management</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Resource Depletion</td>
<td>7.82%</td>
<td>2.9%</td>
<td>17.51%</td>
</tr>
<tr>
<td>Agriculture-Dependent Livelihoods</td>
<td>90%</td>
<td>90%</td>
<td>68%</td>
</tr>
<tr>
<td>Share of Agricultural GDP</td>
<td>34%</td>
<td>32%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Sustainable Infrastructure and Waste Reduction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO₂ emissions</td>
<td>(metric tons, 2010) 0.11</td>
<td>(metric tons, 2010) 0.055</td>
<td>(metric tons, 2010) 0.18</td>
</tr>
<tr>
<td>Renewable Energy (% of Electricity Production)</td>
<td>2010 Hydro (12.7%)</td>
<td>2010 Hydro (47.2%)</td>
<td>2010 Hydro (99.6%)</td>
</tr>
<tr>
<td>Other Renewable Sources: 0%</td>
<td>Other Renewable Sources: 0.4%</td>
<td>Other Renewable Sources: 0%</td>
<td></td>
</tr>
</tbody>
</table>

Figure 11: Overview of Country Indicators