

# Green Growth Ecosystems in Africa

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## Abstract

In international climate discussions, there is increasing recognition that the private sector plays a crucial role in financing actions aimed at mitigating and adapting to climate change. To countries in the Global South, including Sub-Saharan Africa, this is not only a challenge but also an opportunity to attract investments, modernize and adapt their economies to a low carbon footprint. To stimulate private sector investment, a conducive enabling environment is needed, in the context of climate change often referred to as a “Green Growth Ecosystem”. Drawing on scientific publications, policy papers, big data reports and media coverage, the paper explores the concepts of Green Growth and Ecosystems and brings them together in the Green Growth Ecosystem model of the Boston Consulting Group (BCG). The paper then investigates to what extent this model exists in Sub-Saharan Africa (SSA). It notes that very few Green Growth Ecosystems are currently active in SSA, amongst others due to policy ambiguity, lack of implementing capacity and shortage of finance. The paper then suggests a framework that might be more feasible and attractive to the private sector in the form of micro-clusters. Micro-clusters have a number of advantages, such as their local character, a more balanced relationship between local government, local firms and other stakeholders, more manageable infrastructure investments, better understanding of common interests and the building of trust and collaboration. The paper concludes by integrating these characteristics of micro-clusters into the BCG Green Ecosystem model. This way, the model seems better suited for Sub-Saharan Africa.

## I. Introduction

At the recent COP 30 summit in Brazil, it became clear that public funding to adapt to- and mitigate climate change is not going to grow, amongst others due to the withdrawal of the US government from the Paris Agreement 2015 and the Ukraine conflict. One of the conclusions was that more finance needed to come from the private sector. There was also some optimism. Ahead of COP30, Africa was positioning itself as a leader in climate action instead of a climate victim<sup>1</sup>.

However, the conditions for increased private investments in Africa are often lacking. This is particularly true at the level of the firms environment, in the context of climate change often referred to as the “Green Growth Ecosystem”. Policymakers are playing an active role in pursuit of Green Growth through direct investment, economic incentives, and other policy measures. They are also encouraging the agglomeration of research capabilities, technical skills, critical infrastructure, and other factors into green growth ecosystems that hold greater competitive advantage than the sum of their parts (BCG 2023). Ideally, the firms environment sets the rules and parameters in which firms operates. This environment should facilitate green growth while concurrently curbing activities contributing to climate change and other negative environmental and social impacts. However, to what extent is this happening, particularly in developing countries?

On the basis of secondary sources, the paper will take a deeper look at the concept of the Green Growth Ecosystem and apply it to Sub-Saharan Africa (SSA). For this purpose, we will use the ecosystem model of

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<sup>1</sup> [Africa at COP30: From Climate Victim to Climate Leader - FurtherAfrica](#)

the Boston Consulting Group (BCG) and draw on various big data sources, such as the Green Growth Index and the World Bank Good Governance Indicators.

The key questions are;

- a. What are the definitions and elements of concepts such as Green Growth and Ecosystems?
- b. How many of the Green Growth Ecosystems exist in SSA?
- c. What could be an alternative model for a Green Growth Ecosystem in SSA?

The paper will draw some conclusions on the basis of the analysis and formulate recommendations on how a Green Growth Ecosystem could be further developed in SSA.

## II. Green Growth Ecosystem

### *Green Growth*

The first question is about the concept of Green Growth. A common definition of Green Growth is given by the OECD as “fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies”. Consequently, Green Growth is suggested to be a key element in achieving sustainable development: on the one hand, protecting the environment, while on the other hand allowing economic growth (OECD 2011). Albagoury advocates for “inclusive” Green Growth as the growth needs to improve the welfare of current and future generations (Albagoyrt 2016). As Capasso and others pointed out, this broad definition is considered more attractive to politicians and firms, since it is feared that a more strict definition would need massive investments and possibly lead to an economic downturn (Capasso et al 2019). Some experts see Green Growth as an opportunity, arguing that green technologies could actually lead to a new industrial revolution. They have found evidence in the rise to market dominance of Chinese Green technologies such as EV’s and solar panels. A report by the World Economic Forum and BCG finds that the global green economy has already surpassed \$5 trillion and is projected to exceed \$7 trillion by 2030. Green revenues grow faster and firms with green revenues often outperform the market. Over half of global emissions can be addressed with already cost-competitive solutions, with a further 20% close behind<sup>2</sup> (WEF and BCG 2025). The remaining 30% must be mitigated in large part through implementation of new green technologies— approaches that range from low-carbon hydrogen and biofuels to carbon capture, utilization, and storage (CCUS). Some of these technologies are still in their infancy. In order to achieve industrialization at scale in green technologies, six key hurdles need to be taken: product and process development, factory set up, talent sourcing, securing the supply chain, integration into final products and uses and funding (BCG 2023).

Others go further and state that Green Growth is not only about sustainable development, but actually about transformation. Rosenbloom and others state, for example, that net zero entails radically transforming essentially all sectors and industries as they are deeply entwined with the use of fossil fuels and the release of greenhouse gas emissions (Rosenbloom 2022, Lederer 2018). So, Green Growth is inextricably intertwined with sustainability, development and radical change of our economies.

To some, this is too ambitious. Bass argues, for example, that there are still considerable challenges facing developing countries in implementing green transformation, including a large informal economy, high levels of poverty and inequality, weak capacity and resources for innovation and investment, and inadequate governance and institutions. Given these challenges, developing countries are understandably concerned that pursuing green growth could undermine their short-term economic

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<sup>2</sup> <https://www.weforum.org/stories/2025/12/the-5t-green-economy-is-growing-here-s-how-ceos-can-turn-opportunity-into-long-term-growth/>

growth and development (Bass 2013). This realistic perspective is also presented by Barbier. Many developing countries are attracted to green industrial policies because they offer the promise of “technological leadership” in key low-carbon sectors and industries. Yet attaining such a goal requires a degree of structural transformation and industrial development that is beyond the scope of most low and middle-income economies (Barbier 2020).

Barbier (2020) also argued that, to be relevant to low and middle-income economies, green growth must be compatible with the most important development goal, which is poverty alleviation, and second, it must be accompanied by policies that address the key structural features of natural resource use and poverty in these countries, such as the over-exploitation of scarce natural resources, resource dependency and informality. (Omukuti 2025, Barbier 2016 and 2020). This makes Green Growth part of the quest for poverty reduction and sustainable development, which so far has made little progress. The Sustainable Development Report is a global assessment of countries' progress towards achieving the Sustainable Development Goals (SDG's) by 2030. The 2025 report<sup>3</sup> shows that at the global level, none of the 17 SDG's are currently on course to be achieved by 2030, with SSA at the bottom of the rankings. The causes include conflicts, structural vulnerabilities, and limited fiscal space.

Other scholars state that Green Growth in Africa is not only elusive but even a threat. The evidence that Green Growth is compatible with poverty alleviation is more mixed. Dellevoet and Jones (2024), point out that most growth strategies, both in the Global North and the Global South, have so far been based upon the unsustainable and inequitable exploitation of the environment and labour. More “environmentally friendly” policies and regulations, may adversely affect the incomes, livelihoods and employment of the poor (Anderson 2016).

This dilemma for African government is also confirmed by other authors. Healy and others found that climate change embeds inequities and risks which are reinforced in policies for climate change remediation (Healey 2021, Chukwu 2020, Hochstetler 2025). A good example about these dilemma's is given by Jungming He et al (2024). They did a panel data analysis over almost two decades across 37 SSA countries and found that renewable energy and green economic growth have a positive significant impact on food security. On the other hand, industrialisation, through loss of land, pollution, soil degradation and depletion of natural resources, contributes negatively to food security. The implication is that SSA countries should focus on policies aimed at improving green economic growth and renewable energy consumption, while policies aimed at discouraging industrialisation at the expense of agriculture should be adopted (Jungming He et al 2024). However, this stands in stark contrast to the unanimous drive by African governments to move away from agriculture and industrialize<sup>4</sup>.

South-Africa is a good example of the dilemma mentioned above. The country has a high proportion of underground mines, which are more emission-intensive than open-pit mines, and a carbon-intensive electricity supply—about 90 percent of the country's energy comes from coal. Kaggwa et al found that the transition to a green economy presents a mix of challenges and opportunities. Apart from the potential loss of jobs in the energy and mining sector, the country also faces other possible challenges in implementing the transition to a green economy, such as: 1) Limited research into innovative technologies, making the country dependent upon import of green technologies, 2) the need to develop local skills and an infrastructure base that can effectively implement and support the adoption, diffusion and effective use of green technologies, 3) resistance to regulations, for example an emission tax on vehicles, 4) increase of short term production costs and reduced competitiveness in international

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<sup>3</sup> <https://dashboards.sdgindex.org/rankings/>

<sup>4</sup> <https://www.afdb.org/en/documents/africa-industrialization-index-2022>

markets, increasing the trade deficit, because of efforts to 'green' production, 5) further draining the government budget, which is already facing a significant deficit, by providing incentives and subsidies to local producers to encourage them to embrace "green" production (Kaggwa et al 2013).

Shifting global demand patterns could have implications for the continent's oil and gas players in particular. At a global level, the demand for oil could decline by about 50 percent by 2040 under a 1.5°C scenario of global warming. This could render more than 80 percent of African production uncompetitive by 2040, because African countries tend to be at the expensive end of the global supply cost curve, putting \$130 billion of commodity revenue and 800,000 direct and indirect jobs at risk (McKinsey 2021)

Green growth requires strong political commitment and leadership at the highest level of government. It requires dealing with fiscal and economic issues, as well as buy-in from sector-specific agencies or ministries. Interventions also need a broad base of support within and outside the government, as green growth-related policy changes can have materially redistributive consequences. Hence, implementation must take into account the transaction costs of policy changes and trade-offs (Lederer 2018, Bass 2013). As Omukuti points out, abatement from fossil fuels is at the heart of Green Growth and net zero pathways (Omukuti 2025). This type of long-term planning requires that green growth considerations be brought into national policy reform agendas and national development plans, rather than being addressed as stand-alone issues (AfDB 2012).

### *Ecosystems*

The second critical concept is about ecosystems. We are not referring to the biosphere ecosystem, i.e. the complex of living organisms, their physical environment, and all their interrelationships in a particular unit of space. What we mean here, is the ecosystem concept as used in the business management literature, which draws on the biological one, in the sense that is assumed to have the same structure, characteristics and laws as the biological one (Moore 1993). Ecosystems are built from and by a collection of actors, who are not necessarily interconnected initially, and evolve into a more structured community over time as participants interact more frequently. This also leads to the development of structure, which is guided by a set of dominant firms (Moore 1993). Moore's concept of an ecosystem was met with enthusiasm by the academic and management community at the time, but was also criticized for lack of clarity and definition (Oh et al 2016). One of the challenges is how large the ecosystem needs to be. In the marine management sector, focusing on open seas such as the Baltic Sea or the Mediterranean, an ecosystem approach is to take into account the ecosystem integrity and spatial scales associated with the *natural* components of the system. As a result, management measures will not primarily take into account administrative or jurisdictional boundaries. Basically, the spatial scale of management must extend across different biological units and legal jurisdictions to encompass an entire biological ecosystem. In this way, the concept of ecosystem approach also becomes a tool for transboundary law, institutional coordination and cooperation across state borders where the ecosystem does not align with jurisdictional boundaries (Bohman 2019).

In the business literature, such a broad approach would make the concept of a Green Growth ecosystem quite unmanageable. For the purpose of this paper, we shall adopt the definition as given by Ernst and Young (2021): "A firms ecosystem is a purposeful firms arrangement between two or more entities (the members) to create and share in collective value for a common set of customers. Every firms ecosystem has participants, and at least one member acts as the orchestrator of the participants. All members in a firms ecosystem, whether orchestrators or participants, have their brands present in the value propositions."

One of the key features of such an ecosystem is the idea that participating firms seek value creation for their customers, in collaboration rather than competition with other firms, since the sum total is

more than its parts, in terms of resources, brand, market access, information and other market constraints. Another key element is the need for a (group) of orchestrator(s) responsible for the structure and performance of the ecosystem in terms of government relations, governance, coordination, commercial arrangements, value creation and value sharing and risk management. Thirdly, where the ecosystem distinguishes itself from strategic supply chains, is in the fact that all brands are included in the ecosystem, while the supply chain model is dominated by a single brand at the market side of the chain (EY 2021).

The same principles apply to a Green Growth ecosystem. Only by assembling entire ecosystems of complementary organizations—including incumbent industry players, green tech startups, industry associations, educational institutions, and public bodies—can the global community overcome the remaining hurdles and enable critical green technologies to deliver their full potential to mitigate Green House Gasses (BCG 2023). Each ecosystem must include, in addition to the technology's manufacturer, various complementors, suppliers and catalysts, and an orchestrator. Complementors include providers of manufacturing machinery and technology, suppliers of green tech raw materials and components, providers of initial product research and personnel training programs, and firms that plan to use the green tech in their own products. Suppliers and catalysts include firms that provide the technology and software, needed to make the product— including AI, data-sharing platforms, and collective simulation and digital twin software—to other partners in the ecosystem to ensure that they cooperate seamlessly, as well as organizations that promote green tech and provide funding. The orchestrator convenes and connects the other members, driving the ecosystem toward its common goal and helping attract the upfront investment needed for the effort. The success of the ecosystem depends heavily on the quality of the orchestrator, which must be fully acceptable to all other players in the ecosystem. Criteria for choosing a successful orchestrator include whether it will play a significant role in the technology's development and industrialization, sit at the centre of the ecosystem blueprint, benefit significantly from the ecosystem's success, and appeal to other participants as a fair and neutral player, with a track record of past success and a strong reputation (BCG 2023).

As it is the case with all broad concepts in the social sciences, there are many interpretations and models (Liu et al 2024, Sarkodie 2022). Liu et al distinguish three basic types of ecosystems; the firms, platform and innovation ecosystems:

#### The Business ecosystem (BE)

While the purpose of a BE is both value creation and value capture, gaining competitive advantages against outsiders takes precedence. It aims to foster innovation internally, among its members, facilitate efficient value creation, gain competitive advantages, and optimize the utilization of social and natural resources. BEs provide stability and resilience, particularly in resisting external interference and internal disruptions. The inherent unpredictability of extreme events motivates long-lasting and stable firms operations within the ecosystem, fostering the continuous emergence of innovative services and firms models.

#### The platform ecosystem (PE)

The essence of a PE lies in its role as a complex network structure, where a diverse array of participants, including platform providers, developers, partners, customers, and stakeholders, engage in close interactions. Unlike isolated entities, these participants collaborate within the PE framework, fostering various forms of interaction such as data sharing, application integration, co-development, and market collaboration. This multi-party collaboration not only transcends organizational boundaries but also positions the PE as a focal point for innovation and value creation.

#### The innovation ecosystem (IE)

The IE stands out with a primary goal of value co-creation through innovation, distinguishing it from traditional BEs that are primarily focused on value capture. Driven by global competition and rapid technological advancement, the importance of external participation in R&D and product innovation is pivotal. This shift has propelled innovation activities from initial independent efforts to intricate structures and value propositions, where participating firms engage in interactions to co-create value and establish a collaborative ecosystem comprising actors, assets, and connections. This ecosystem is sometimes referred to as Triple Helix partnerships, encompassing collaboration between academia, government and the private sector.

Common features of these ecosystems include: 1) multi-participant and complex network structures, 2) coordination and cooperation for value creation, 3) digital transformation and technology integration, 4) continuous innovation and effective governance. However, there are also differences in terms of participant types, core concepts, goals, features, value co-creation, and governance. The BE encompasses a broad range of organizational connections, emphasizing the overall value creation through collaboration and competition, and is distinguished by interdependence among its components. In contrast, the IE involves enterprises, innovators, and research institutions, focusing on innovation and an open environment that encourages multi-party contribution to greater innovation. The PE, comprising providers, developers, partners and customers, centres on the platform, fostering diversity and an open environment to prompt collaboration and competition dynamics for joint innovation. Each ecosystem emphasizes value co-creation, with the BE fostering overall collaboration, the IE focusing on new ideas and technologies, and the PE allowing customization and creating shared value. Governance mechanisms differ, with the BE requiring a stable organizational structure, the IE needing mechanisms to balance interests, and the PE relying on effective governance for coordination and decision-making (Liu 2024).

*The Green Growth ecosystem*

For the purpose of this paper, analysing the many different types of ecosystems make an analysis of Green Growth ecosystems for an entire continent like Africa, very complex. There is need for a more simplified and generic concept in which critical components of Green Growth and firms ecosystems are integrated. One of the most comprehensive and yet concrete frameworks of a Green Growth ecosystem is the one developed by the Boston Consulting Group (BCG) as depicted in figure 1 below.

**A Framework for Building Green Growth Ecosystems**

<b>1</b>	<b>Orchestrate</b>	Public-private engagement structures (e.g., working groups, forums)	Facilitation office/ organizational entity	Roadmaps (i.e., sector-specific, workforce development)	Technology transfer programs/inter-agency information sharing
		<b>Capital</b>	<b>Innovation</b>	<b>Demand</b>	
		Attract and incentivize development of required physical capital	Develop workforce for future needs and spur technological innovation	Underwrite risk of scaling production or decarbonizing	
<b>2</b>	<b>Provide</b>	Precincts State-owned/shared infrastructure State-owned enterprises	Education and training programs Innovation hubs and accelerators Public R&D	Green public procurement Demand facilitation	
<b>3</b>	<b>Pay</b>	Capex subsidies/tax incentives Concessional financing Equity stakes	Innovation grants R&D tax incentives	Contracts for difference Production subsidies/tax incentives Consumption subsidy/tax incentives	
<b>4</b>	<b>Regulate</b>	Permit processing efficiency Zoning laws (e.g., industrial parks)	Data-sharing regulations IP laws Talent attraction and retention	Emissions standards	

Source: BCG analysis.  
 Note: Each policy lever is allocated based on greatest effect.

Figure 1. the Green Growth Ecosystem (Source; BCG)

The BCG model allows us to distinguish just four critical elements that constitute a Green Growth ecosystem: 1) Orchestrate the various stakeholders into coordinated planning and delivery. 2) Provide capital, innovation, or demand via procurement mechanisms. Government can address gaps in critical infrastructure by directly providing infrastructure itself. The government can also provide innovation and skills via education and training programs or public R&D programs 3) Pay others to finance, innovate, or purchase through financial mechanisms. The government uses public funding to support private sector activity. It can support capital investments through concessional financing, guarantees, and equity stakes for pre-commercial technologies, 4) Regulate to create the enabling conditions. Government can do this by creating clear and efficient laws and regulations, which are critical to remove barriers to deployment and to enable ecosystems to operate effectively (BCG 2025).

While most models agree on the need for networks, research and innovation, finance and infrastructure, they are less clear on the orchestration or the governance of the ecosystem (BCG 2025, WEF 2024). Of course, Governance at the firm level is also recognized in ESG criteria for impact investors, but at the sectoral, market system or ecosystem level it is much less clear. Often, there is reference to policy and reporting frameworks and voluntary standards, but there is virtually no literature on rules setting and enforcement (Omukuti 2025). This is critical as designing governance mechanisms is a strategic need to address the openness paradox in ecosystems, balancing the interests of all parties, maintaining ecosystem stability, and ensuring orderly and sustainable interactions (Liu et al 2024). In advanced economies, the governance of the ecosystem is assumed to fall partially or exclusively under the government's jurisdiction and enforcement and regulation is often delegated to specialised (semi)public agencies such as the Environmental Protection Agency. The BCG model described above also relies heavily on government (BCG 2025, Lederer 2018) that establishes the political, legal and administrative framework in which orchestration between ecosystem members can happen, facilitated by an organizational entity. BCG describes it as building "productive collaboration between ecosystem players, and between players and government". It highlights the role of a central engagement office which will run regular working groups, industry forums, and other processes to inform and shape the ecosystem. Frequent, ongoing consultation and collaboration are also common, as managers monitor and adapt to changing opportunities. Choi et al simply define governance in functional terms as "the workable mechanism for sustainable performance of the collaboration network"(Choi et al 2016).

However, in weak or failed states, the government often isn't able to provide the political, legal and administrative framework (Lederer 2018) nor actively participate in the ecosystem. In the absence of government, the governance of the Green Growth ecosystem, for example to ensure the sustainable production and trade of commodities, needs to be organized by the non-governmental partners such as civil society and the private sector (WEF 2024).

Partnerships, for example in commodities, address the governance problem to varying degrees by contributing to the spread of sustainability values, implementing activities at the production level aiming at the transfer of technical skills, establishing private rules for production or creating linkages to each other, thereby offering institutional opportunities (Bitzer 2011). By fulfilling these functions, partnerships act as important agents for technological change which improves the production processes and benefits local farmers, who receive training and possibly higher prices for their produce. These practices may have a chain-wide impact if coupled with competitive standards or embedded in collaborative networks. However, they do not change existing power asymmetries in the commodity chains between large buyers and smallholder producers. From a development perspective, these partnerships have limited impact due to their inability to empower smallholder farmers, or distribute fairly the costs and benefits of different certification schemes (Bitzer 2011). In other words; in the absence of the redistributive and regulatory function of government, how will ecosystem partnerships ensure inclusive, sustainable development?

### III. Green Growth ecosystems in Sub-Sahara Africa

Africa faces the dual challenge of decarbonizing its industries while building new industrial capacity. The continent is richly endowed with renewable energy resources and critical minerals that are indispensable for global clean energy transitions. If African countries want to benefit from these opportunities, it demands investment in innovation ecosystems that link startups, research hubs, manufacturing firms, and policymakers (ACET 2025). However, many firms lack green technology opportunities, sufficient technical capacity, or access to finance, further widening the gap in green industrial adoption. Without deliberate policy and financial support, these structural limitations could stall broader industrial transformation in Africa (ACET 2025).

The BCG Green Ecosystem model puts a strong emphasis on the availability of finance for green investments and sees an important role for subsidies, concessional finance and grants. However, Africa's governments face serious debt challenges, which are only exacerbated by geopolitical turmoil such as the dramatic rise in oil prices due to the recent conflict between Iran and the US and Israel. In late 2023, 10 low-income countries were in debt distress, and an additional 26 were at high risk. With public debt-to-GDP ratios rising, the fiscal space for climate action and industrial investment is shrinking<sup>5</sup>. Investing in Green tech solutions requires significant up-front investments. Finance is a major issue. According to the Climate Policy Initiative (CPI), African countries collectively require an estimated \$2.8 trillion between 2020 and 2030 to implement their Nationally Determined Contributions (NDCs) and meet climate mitigation and adaptation goals. This translates to an annual investment need of \$277 billion. Yet, in 2021–2022, Africa received only \$30 billion in total climate finance, just 11 percent of the required yearly amount, highlighting a significant funding gap that also constrains industrial transformation (ACET 2025, UNDP and AU 2024).

As we saw above, innovation is a key driver of ecosystem collaboration and important to capture the opportunities of the Green economy. A useful overview is given by the WIPO global innovation index 2025. It includes 78 different indicators such as R&D investments, ICT access, infrastructure, presence of venture capital, innovation ecosystems Unfortunately and others. Unfortunately, the index shows that the state of innovation in Africa is among the lowest in the world, except for Mauritius and South-Africa<sup>6</sup>. The low level of innovation also has an effect on competitiveness and Green Growth. The IMD world competitiveness index ranks middle and high income countries according to how they manage their competencies for long term value creation such as the economic performance, government efficiency, firms efficiency and infrastructure. Out of 69 countries, only a handful of African countries were included with the first one, Kenya, at position 56, while South Africa stands at 64 and Nigeria at 67. The index shows that Africa still has a long way to go in raising its competitiveness<sup>7</sup>. So far, development of Green Growth Ecosystems has been very limited in Africa. First of all, only a few major economies have seen the development of an innovation and technology sector that could lead the way on Green Growth. There has been a rise in tech hubs and an increasing number of universities are specializing in science and technology, particularly in countries such as Kenya, Nigeria, South Africa, and Morocco. Yet this growth has not reflected significantly in technical and financial capacity to support green innovation for industrial purposes. Climate-tech innovations in Africa have mostly focused on household CO2-reducing

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<sup>5</sup> <https://africa.firmsinsider.com/local/markets/10-african-countries-with-the-highest-imf-debt-at-the-end-of-2025/96ls9kd>

<sup>6</sup> <https://www.wipo.int/web-publications/global-innovation-index-2025/en/gii-2025-results.html>

<sup>7</sup> <https://www.imd.org/entity-profile/south-africa-wcr/>

innovations such as off-grid solar, cookstoves, biogas, and household water treatment, with less investment into industrial green technologies and solutions (ACET 2025).

The African Greentech database<sup>8</sup> also doesn't provide an answer if African Greentech firms are part of a Green Growth ecosystem as described above. The website suggests that the firms in the database are "driving the Green ecosystem", but the diversity in location, size and services suggests that the database is more like an inventory of existing Greentech firms in each African country. Although Africa hosts over a 1,000 tech hubs supporting various innovation sectors, only a handful specialize in clean technology. A 2022 report identified just four specialized clean tech hubs across the continent (ACET 2025).

In a Green Growth ecosystem, there is a lot of emphasis on the need for investment in infrastructure. The Africa Infrastructure Development Index (AIDI) is produced by the African Development Bank. The AIDI serves a number of key objectives, such as to monitor and evaluate the status and progress of infrastructure development across the continent. The Index includes the state of water and sanitation, ICT, electricity and transport<sup>9</sup>. It shows that infrastructure development is generally progressing, but mostly in North-Africa and middle-income countries in SSA.

As mentioned above, governance of Green Growth ecosystems is a major challenge in Africa. While strategies exist on paper, implementation remains very weak. The dynamics of the political economy across Africa's 54 countries vary widely, and institutional inertia often hinders progress (Chukwu 2020). Looking at the specific country cases of Malawi, Mozambique and South Africa, Resnick et al found that, adopting a Green Growth approach towards inorganic fertilizers, biofuel production and reduction of coal-based energy, respectively, would not only be economically costly but also generate substantial domestic resistance, especially among the poor (Resnick 2012). This picture also emerges from the Green Growth "readiness assessment" of the African Development Bank and the Global Green Growth Institute (GGGI), who highlight that most African governments show commitment to Green Growth in Africa, including active championing of NDC's and adherence to the SDG's, but lack the translation into planning and budgeting as well as implementation (AfDB and GGGI 2021). As we saw above, the regulatory quality and government effectiveness are critical for Green Growth. Regrettably, the WB Good Governance Indicators show a rather sombre overview of governance in Sub-Saharan Africa. Over a period of 2014-2024, good governance in SSA remained static at a low level, and in the case of political stability and voice and accountability actually fell back<sup>10</sup>. Weak governance also plays a role at the meso-level. All ecosystem models, particularly those on Green Growth, assume an active coordinating and sometimes steering role of (local) government (BCG 2025). Given the state of governance in most of Africa, it is fair to assume that government will not be able to play this role.

African governments are not the only ones who are ambivalent. Across the industry, there are doubts about the existence of a viable consumer market for green products that could justify the transition to sustainable production. Low household spending power constrains domestic demand. As noted above, poverty is still widespread in Sub-Saharan Africa. By 2030, an estimated one in three people will still live on less than \$2.15 a day, severely limiting the ability of most consumers to absorb the price premiums often associated with green products. Without targeted interventions such as subsidies, tax incentives, or preferential procurement, many industries will struggle to recover the higher upfront and operational costs of adopting green technologies through domestic sales alone. This challenge is especially evident

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<sup>8</sup> <https://greentechdatabase.africa/about-the-african-greentech-database>

<sup>9</sup> <https://infrastructureafrica.opendataforafrica.org/rscznob/africa-infrastructure-development-index-aidi>

<sup>10</sup> <https://www.worldbank.org/en/publication/worldwide-governance-indicators/interactive-data-access>

in capital-intensive sectors such as iron and steel production, where cleaner alternatives require major investments but attract limited demand or policy support. This may lead to an export-led approach of products such as green hydrogen, but may leave local markets with cheaper, high-emission alternatives, which limits the domestic diffusion of sustainable products and slows the overall green transition (ACET 2025). The lack of interest in Green Growth investments by the private sector is perhaps best illustrated by the nature of the financing. In more mature markets, financing of Green Growth includes a wide range of financial instruments such as grants, (concessional) loans, equity, climate bonds, risk sharing, guarantee mechanisms, performance-based payments and debt swaps. However, in SSA, by far, most of the reported climate finance flows are delivered in the form of grants or concessional loans by donors and international, multilateral institutions (ACET 2025).

These constraints have led to an overall weak progress of Green Growth worldwide, but particularly in SSA. The Green Growth Index 2.0 provides an enhanced policy tool to measure progress and momentum of green growth transition across the globe. The index applies a consistent four-dimensional framework, including efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion. Even top-performing countries such as the United States and Denmark remain 30 points away from the green growth target of 100. With 57 countries still only halfway toward this target and 93 lagging even further behind, global green growth still has a long way to go. Africa scores quite low, between 38 and 56 points on the index, more or less in line with Asia, Oceania and the Americas. However, if one looks at the indicators, this result seems more linked to the low level of industrialization, transport and commercial agriculture, than on a transformation to a low carbon economy. For example, Africa scores quite high on natural capital protection, not because of strong government intervention but low levels of exploitation (Green Growth Index 2025).

These findings are in line with Ofori et al (2024), who developed an Inclusive Green Growth index by taking into account variables from the WB World Development Indicators, that matter for a country's triple bottom line, viz., economy, society, and the environment. Of the 22 sampled countries, the data shows that only 9 are growing green and inclusive. These countries are Togo, Mauritius, Nigeria, Benin, Ghana, Morocco, Senegal, Tunisia, and Tanzania. According to the researchers the score of these countries can be explained as a result of their strong commitment to income equality reduction, poverty alleviation, enhanced access to essential social resources, and renewable energy (Ofori et al 2024) . However, if one looks at the environmental sustainability indicators of the study, then one can only conclude that the result is heavily influenced by the absence of pollution due to low levels of industrialization, low input subsistence agriculture and hydro energy supply which is categorized as renewable (Chukwu 2020).

#### IV. Micro-clusters as Green Growth ecosystems

In view of the constraints as described above, it seems that the concept of Green Growth ecosystems in Africa needs to be narrowed down to a level where the concept becomes concrete, manageable and realistic. As Omukuti signals, after reviewing the Green Growth efforts by Kenya, Malawi and South Africa, Green growth is an ambition that is pursued by governments at the national level while the decision to set and implement net zero targets is made by local government and firms, depending on their needs and capabilities (Omukuti 2025). Hence, while policies and regulations need to be set at the national level, the actual implementation and support beyond individual firms takes place at the meso-level such as eco-industrial parks, green value chains, firms platforms, firms finance and firms support organizations (DCED 2022).

As noted in the introduction, it is expected that the necessary finance for Green Growth needs to increasingly come from the private sector as governments are not investing enough to combat climate change. However, this means that the private sector needs to be in the driving seat when it comes to Green Growth, and that the required investments in, for example renewable energy, will follow the same

logic as other investments (APEC 2022). As highlighted in our earlier research into inclusive firms (Dellevoet/Jones 2024), broad social concepts such as a “Green Growth ecosystem”, which may span regions or whole countries, multiple sectors and countless actors, are too broad for firms to understand their role and where and when investments need to be made. Investment decisions by for-profit firms tend to be based upon the expectation of future returns. Firms prioritize investment as a mechanism for growth, risk management, and operational efficiency. To do this, they need very specific information regarding markets, competition, costs/benefits and risks within a clearly defined space or market segment (Bodie et al 2013, DCED 2022). Growing in the green economy market requires the same firms fundamentals as any successful venture: a clear purpose and strategy, a compelling value proposition, and an agile operating model built for rapid scaling. Firms leverage growth accelerators to rigorously push for technology maturity and bring down the costs of nascent technologies. They are often able to shape regulation and mobilize early adopters and they are able to unlock smart capital in support of a viable business case for their green offering (WEF and BCG 2025).

The advantages of Green Growth ecosystems are particularly clear when the number of actors and space are limited, hence the need for geographical concentration of an ecosystem. Lessons can be drawn from spatial economics or Evolutionary Economic Geography (EEG). EEG explains where and how specific industrial growth paths emerge in the economic landscape, with key emphasis placed on the presence of pre-existing regional capabilities such as a skilled workforce. Carpasso et al identified five core themes as crucial for the emergence of place specific transition paths: technological and industrial specialisation (including knowledge), natural resource endowments, market formation, institutions and policies. Carpasso also observed that actual knowledge creation, experimentation, innovation processes and industrial development are strongly linked to particular cities and regions (Carpasso et al 2019). Formulated this way, the Green ecosystem concept shows a lot of similarities with industrial clusters as an intermediate form of a “firms ecosystem”, which is a community of organizations, institutions and individuals influencing the company, its customers and suppliers (Ivanova 2023). In other words; the company and its direct firms environment.

A cluster is a geographic concentration of related firms, organizations, and institutions in a particular field. Clusters arise because they raise a company's productivity, which is influenced by local assets and the presence of like firms, institutions, and infrastructure that surround it (WEF 2024). Not all clusters are the same. The basic model of a cluster is one in which different firms operate in the same region with varying modes of interaction and collaboration as well as competition.

Micro cluster	Sectoral cluster	Horizontal cluster	Vertical cluster
Same location, such as an urban industrial area, but different firms, i.e. primary production, processing and services.	Same sector (i.e. horticulture) but different firms, i.e. exports of cash crops like cocoa, coffee, tea etc.	Interaction and collaboration (i.e. sharing resources, conduct R&D) between different firms in different sectors.	Interaction and collaboration between firms in the same value chain, from product development to retail.

Table 1. Different clusters (source; author)

According to Ivanova (2023), the key distinction between the various models is the control element; who coordinates and leads the cluster both in its internal and external environment. Similar to firms organization at the micro-level, such as farmer cooperatives, Ivanova argues that this role has to be performed by a management unit that possesses the intangible assets of a cluster, connects the participants, concludes contracts and sells products and services on the market. It performs functions which each cluster participant can't perform individually (Ivanova 2023).

In view of increasing obligations for chain responsibility, international firms increasingly ask their suppliers to set targets too. Firms at the forefront are integrating sustainability metrics into their

procurement policies and practices to make climate a KPI for sourcing. This includes using their financial power to exclude retracting firms if adequate progress isn't made, but also to incentivize good climate action with better firms. This model not only can be a powerful motivator and effective method for making progress with individual suppliers, but it also helps to send broader demand signals about the expectations of buyers, normalizing and institutionalizing expectations for climate action (Leitheiser 2022).

With industry responsible for 30% of total global CO<sub>2</sub> emissions, industrial clusters will be a critical player in accelerating the path towards net zero (WEF 2024). However, progress is slow. The WEF transitioning Industrial Clusters Annual Report highlights the experiences and perspectives of 20 industrial clusters within the initiative, including the Dutch Brightlands initiative, that have developed comprehensive strategies to reach net zero while attaining their full economic and employment potential. The report notes that even in these well-established industrial clusters across geographic boundaries, there is still a notable deficiency in both governance and collaboration. In some cases, poor infrastructure and high transport costs can also limit the benefits of clustering (WEF 2024).

#### *Micro-level clusters*

In view of these complexities, scale and scope of the cluster may need to be further limited. Micro-level clusters are a crucial yet often overlooked aspect of regional economic development, playing a vital role in fostering innovation, enhancing productivity, and driving sustainable growth. These clusters refer to geographically concentrated groups of interconnected firms, suppliers, and institutions within a specific industry or sector. At its core, a micro-level cluster comprises small and medium-sized enterprises (SMEs) within a particular industry that operate within close proximity to each other. This geographical concentration allows firms to benefit from shared resources, specialized suppliers, a skilled labour force, and infrastructure. Unlike large-scale industrial clusters that might span entire regions or cities, micro-level clusters focus on a more localized, neighbourhood-scale concentration of firms. They tend to form in industries such as handicrafts, textiles, food processing, and technology services.

Proximity of firms and personal contacts between owners/managers are also critical for building trust and collaboration. Lombardi et al use the concept of "embeddedness", which is concerned with the role of concrete personal relations and networks of such relations in generating trust and discouraging malfeasance during formal and informal economic interactions, and finds that promoting sustainability can be better achieved when integrated with existing frameworks of firms collaboration such as the 3H partnerships, agricultural value chains and industrial clusters (Lombardi et al 2012). When identifying drivers and barriers to Green Growth innovation, Choi et al (2016) highlight evidence from China, where the unique cultural factor of Guanxi, a social enterprise network with full responsibility, trust and loyalty to each other leads to a network ability, social responsibility ability and strategic leadership, which all had a significant effect on technological innovation. However, in other cases this was not enough as firms were also found to be involved in "Greenwashing". Choi et al. emphasized the need for stick and carrot policies and an equitable approach on land use, which go beyond the Guanxi system and largely depends on government interventions.

In SSA, it seems that micro-level clusters are already being developed in several countries. One notable initiative is Ethiopia's "Eco-Industrial Hubs", which are driven by a deliberate green industrial policy and supported by development partners, including the World Bank and the Korean Green Growth Trust Fund. These hubs represent viable pathways for advancing green, light manufacturing. As of today, 24 eco-industrial parks are in operation across Ethiopia. Of these, 17 were developed by the government, comprising four integrated agro-processing industrial parks established by regional state governments and 13 developed at the federal level. The remaining seven are privately owned and operated by foreign firms (ACET 2025).

Deliberate promotion of these micro-level clusters also attracts more investment. In the period between January 2015 and April 2023, green ecosystem investments attracted more than USD 3bn, which represented 16% of the total funding into Africa’s digital, tech and green ecosystems within the period. However, the scope and geographical distribution still remains limited. 88% of the funding went to renewable energy such as large scale wind, geothermal and hydro projects, and the main recipients were a handful of countries such as Kenya, Nigeria and South Africa (Tambo et al 2025). The investments also show the way forward for Green Growth in Africa. Finance is particularly available for renewable energy projects in geographical concentrations like hubs or clusters in large domestic in middle income countries with large domestic markets. There is very little scope for fundamental research by universities, as government budgets are very limited, or innovation and R&D by specialized institutions or large firms. As Barbier noted in his examples of Morocco, Kenya and South Africa, this leaves Africa with the need to focus on relatively cheap, low-tech and standardized technologies and products, as shown in figure 2 below.

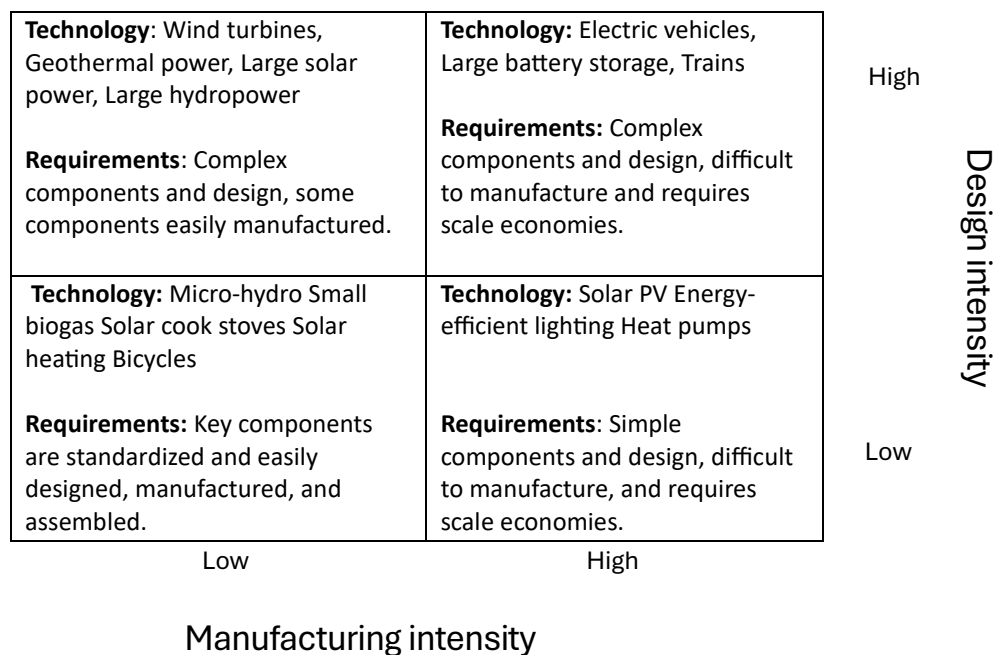


Figure 2. Intensity of design and manufacturing (Source: Barbier 2020).

This doesn’t mean that Africa misses out on new green technologies. The point is that this is more likely achieved through partnerships (ACET 2025, Ofori 2022). Ofori states that foreign direct investment (FDI) can generate durable and equitable wealth through technological transfer, innovation, industrialisation, forward and backward linkages, macroeconomic stability, employment, and poverty alleviation (Ofori 2022). The Africa-europe foundation published a recent report in which they advocated for energy cooperation between Europe and Africa through partnerships that allow for a variety of contributions - whether financial, technical, or strategic. The study identified concrete cross-border opportunities in green ammonia and green iron/steel value chains as practical examples of how “interconnected competitiveness” for green industrialisation can be implemented. European investors could take the lead and provide know how and finance, while the African partners would provide the asset base and labour (Africa-europe Foundation 2025). In the same vein, McKinsey identified several Green Growth opportunities for SSA in: 1) delivering energy access and affordability for example by investing in locally manufactured or assembled renewables and storage, 2) ensuring resilient and productive economies, for example by accelerating the agricultural transition to a more productive, low carbon sector or scale green manufacturing, 3) improving health and quality of life for example by promoting urban mobility through

EV's, and 4) opening up major new export sectors, such as Green Hydrogen and the export of carbon credits (McKinsey 2021, Editor 2025).

### *The challenge of governance*

As noted above, one of the key elements of a successful partnership is governance. In the absence of (local) government, as is the case in most of Sub Sahara Africa, the cluster will need an independent, external player or orchestrator to develop the initial design, identify required partners and capabilities, and bring them together (BCG 2023). To perform the designer role well, an organization should possess three key characteristics:

- 1) It should have experience in a range of sectors, contacts in multiple industries, the ability to identify best-in-class stakeholders, a thorough grasp of their reasons for participating, and the ability to maintain the ecosystem's cohesiveness.
- 2) It should have experience in facilitating collaboration among multiple stakeholders, building partnerships, and combining the overall effort's industrial and technological aspects.
- 3) It should have links to public authorities to help it secure public funding and the capacity to articulate the ecosystem's value in the context of existing public green tech initiatives (BCG 2023).

To build trust, this external player must be fair to all partners, compliant with laws and norms, and unbiased in providing access to data, for example. It must effectively foster collaboration and alignment between participants, encouraging participation in and growth of the ecosystem and it must be flexible enough to adapt to changing circumstances, such as shifts in the market or the development of relevant new technologies. It is difficult to see how a single lead firm, even an MNC, could play this role, unless the scale and scope of the partnership remains focused and limited.

Other authors point out that there are alternative models of governance of the micro-cluster or ecosystem. Drawing on the experience in Finland, Sotarauta (2019) focuses on the leading role, which he calls "place leadership". This type of leadership is more like a platform, concerned with mobilizing, directing, coordinating and facilitating interorganizational development strategies and practices across many institutional and organizational boundaries. In places with limited formal authority, this approach focuses more on the networked processes of transformation, including Green Growth, instead of solely focusing on structures determining regional economic development. (Sotarauta 2019). The study emphasizes the open innovation ecosystem, in the sense that; a) it advocates for mobilization of small firms and individuals, and not only the main firms and universities and their research centres, as was the case in Finnish cluster policy; (b) to focus more on user experience rather than firms clusters around successful products and (c) to carry out quick experimentations instead of large company led research programmes with their academic partners. This calls for a different kind of leadership. Because of the limited capacity to influence in a multi-actor and multi-purpose setting, leading actors resort to indirect soft measures, such as awareness raising, coaching, dialogue, visioning on platforms and guiding interaction towards experimentation (Sotarauta 2019).

In the same vein, Rosenbloom advocates for a governance solution called "an accelerator" that drives the Green Growth pathway to net zero. It aims to accelerate movement in areas where governments have so far been unable or unwilling to act decisively. By building coalitions of innovators—those with the interest and capacity to induce change—the accelerator helps shift relationships on the ground and achieve practical advances. It is not the structure of the articulator that is paramount but rather the functions they perform. These functions include articulating visions, networking, generating and allocating resources, capacity building, and carrying out pilot projects. Key advantage is that they can operate independently and more flexibly than government in incubating and scaling up novel approaches to accelerate transition pathways (Rosenbloom 2022). This is in line with Bogdanova, who refers to

systems of innovation theory, to describe how regional actors, including municipalities, research institutions, and firms, form interconnected systems that shape the generation, diffusion, and commercialization of knowledge (Bogdanova 2025).

Is the governance by platforms or networks robust enough to move to Green Growth? As we saw above, stakeholders have divergent interests, national governments are hesitant. Bohman (2019) analysed the effectiveness of aquatic environmental law in the EU as part of an ecosystem approach and found that, to facilitate effective enforcement, both substantive and procedural goals must be accompanied by implementing rules – or objectives themselves must be legally binding – to ensure compliance with adaptive aquatic planning and management (Bohman 2019). Furthermore, environmental regulations must set certain time limits for reaching the goals, and be linked to obligations and penalties in a case of non-compliance. However, it is not sufficient to have a legal structure that is directly connected to ecosystem assessments, particularly when it is difficult to trace environmental change and environmental progress as a linear outcome of any measures taken. If the object of regulation is also difficult to monitor – like diffuse nutrient pollution – there are opportunities to free-ride, particularly if obligations are vaguely formulated. This means that cluster participants may choose a low ambition of implementation and compliance and rely on other stakeholders to bear the brunt of investments. Multi-level Expert and government inspections and stakeholder consultations in the EU work well in enhancing compliance, rather than self-reporting which didn't work well. These institutional developments have essentially resulted in a review structure that resembles a managerial compliance process. Many of the stakeholders involved are those who will be directly affected by new regulatory measures. This can be criticized since it is likely that these actors might create obstacles to stricter measures. However, it also means that the level of acceptance of any measures that are adopted becomes higher, and acceptance is often a good basis for implementation and compliance. This process of developing 'managerial compliance' has allowed the further development of solutions to issues that have resisted regulation through the more traditional law-making processes (Bohman 2019).

In line with Bohman's observations, it seems that an effective institutional governance solution is needed in Green Growth ecosystems. When it comes to specialization, rules setting and enforcement, a good example can be found in the structure of an Environmental Protection Agency (EPA). For example, the EPA in Ireland, has three main functions:

- 1) implementing effective regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply for example through licensing, audits and inspections and prosecution;
- 2) Providing high quality, targeted and timely environmental data, information and assessment to inform decision making at all levels;
- 3) Working with others to advocate for a clean, productive and well protected environment and for sustainable environmental behaviour (EPA 2017).

In most African countries such an EPA exists, but as we saw above, in terms of governance, such government agencies are often under resourced and ineffective when they touch the political economy. Hence, a more effective approach might be to decentralize environmental protection to a local legal body, such as a Public Private Partnership (PPP), in which local government, experts from in-and outside of the academic environment, civil society and firms collaborate as suggested by Bohman, Bogdanova and others. This approach is close to what Van Zeijl-Rozema called the "ecological sustainability-deliberative type" of governance, where representatives of the state (local government), market and civil society decide on an equal basis on how best to achieve the goals of sustainable development. Actors arrive at the best or most wanted solutions by negotiation and learning by doing. There is a high degree of discretion regarding the implementation (Van Zeijl-Rozema 2011). However, as we noted, in the absence

of a knowledgeable and capable government and the need for strong orchestration among different actors and interests, the model also draws on what Van Zeijl-Rozema describes as the “well-being hierarchical type” of governance, in which a leading actor or institution consults society in the goal-setting process, but seeks a consensus perspective, sets priorities and drives implementation. Wellbeing is narrowed down to concrete targets like jobs and income and based upon a rational cost-benefit analysis (Van Zeijl-Rozema 2011).

After all these considerations, the BCG Green ecosystem model can be adapted to African circumstances. Table 2 below provides an overview of the model.

<b>Orchestrate</b>	Local governance partnerships between government, firms, civil society and foreign investors in micro-clusters	Independent Institution with expertise, convening, regulation and enforcement capacity	Vision, strategy and concrete pathway to low carbon, net zero sustainable development, supported by cluster stakeholders	Transfer of know-how, development of skilled workforce
	<b>Capital</b>	<b>Innovation</b>	<b>Demand</b>	<b>Know how</b>
<b>Provide</b>	Infrastructure investments such as reliable energy supply, roads.  Financed under PPP.	Transfer of know how in existing technologies, through partnerships  Little R&D, build upon local solutions in low tech, low cost, proven technologies	Green procurement by large firms and local government	Local provision of Education and TVET training programs in collaboration with participating firms (demand driven)
<b>Pay</b>	Grants and concessional finance from international donors and multilateral institutions  Limited equity investments in renewable energy	Tax incentives such as deduction of cost of investments in renewable energy, waste management etc.  Carbon credits, blended finance, Green bonds  Joint application for funds from international climate funds	Stimulate local demand for renewable energy by large cluster firms  Consumption subsidies for green products  Production subsidies to reduce carbon footprint, especially for local small firms	Grants from international donors  Internships and apprenticeships targeted at green technologies and firms operations  Financed under PPP, incl. tax rebates for participating firms
<b>Regulate</b>	Cluster development and management (possibly by act of parliament)	Delegation of authority to the local institution  Conflict settlement between cluster partners through arbitration  Protection of IP rights for foreign investors	Realistic targets in regulation for emissions and waste  Setting up effective monitoring mechanisms and inspections	Ensure that local education and TVET standards are in line with national policy guidelines.

Table 2. The BCG Green ecosystem in Africa (source: author)

## V. Conclusion and recommendations

It is widely acknowledged that the private sector will play a critical role in combating climate change. This will depend to a large extent on the existence of a conducive enabling environment, similar to the discussions on private sector development within the mainstream aid industry. In the framework of climate change and sustainability, the enabling environment for Green Growth is often referred to as an ecosystem. In this paper we asked ourselves to what extent such a Green Growth ecosystem exists in Sub Saharan Africa (SSA). First, we explored the many dimensions of Green Growth and noted its expansion into broader concepts such as inclusive, sustainable development and transformation into a low carbon or net zero economy. Some see this as an opportunity for growth, others as a threat since the transition will come with a price i.e. public investments and more debt, loss of jobs and income and more social unrest.

We then looked at the concept of an ecosystem, which is also broadly defined and may be differentiated in its purpose and set-up as a Business ecosystem, Platform ecosystem or Innovation ecosystem. This differentiation makes it difficult for analysis in such a large area such as SSA, Hence, we chose a model from the Boston Consulting Group (BCG) which encompasses all the critical elements of an ecosystem, such as network, collaboration, innovation and governance, and focused it on Green Growth.

Subsequently, we applied the Green Growth Ecosystem model to SSA. Recent studies have revealed that very few Green Growth ecosystems exist in SSA. Governments involvement is mostly at the policy level, but resources and implementing capacity are very constrained. New technologies are mostly developed by cash starved universities, while links with industry are weak. Renewable energy investments are happening but mostly in a few large economies such as Nigeria, South-Africa and Kenya. Access to finance is very restricted. Infrastructure, including internet connectivity and regular electricity supply, is limited.

In light of these limitations, we concluded that the Green Growth ecosystem needs to be limited in space and time if it is to be relevant for the private sector investments in Green Growth in Africa. Markets change constantly and so does the availability of technology and systems. This requires flexibility and adaptability that few governments can handle. Furthermore, given the lack of adequate infrastructure, including ICT, weak government capacity and need for firms to organize and invest themselves, the concept of Industrial micro-clusters seems more appropriate to African circumstances. Clusters are geographic concentrations of interconnected firms, suppliers, and institutions within a specific industry, often driving competitive advantage through close relationships and shared resources. While ecosystems can encompass multiple clusters and industries, clusters are typically more focused and localized.

This approach allowed us to revisit the BCG Green Ecosystem Model and identify concrete actions and elements of that model in SSA. This includes the need for orchestration, which in the context of Green Growth, will involve difficult trade-offs between different stakeholders, and thus an effective governance solution that goes beyond convening, but also includes regulation and enforcement through monitoring and inspections. Another critical element is the finance, which will depend much more on external resources, such as donor funds or climate finance mechanisms as well as private investments in local infrastructure and renewable energy, transfer of know-how to local firms as well as skills development for the local workforce. Such an involvement calls for other forms of collaboration, for example through public-private partnerships.

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