



## Technical paper

# INNOVATIONS AND EMERGING ISSUES WITHIN THE ENVIRONMENTAL SECTOR

1ST AFRICA ENVIRONMENT PARTNERSHIP PLATFORM (AEPP) MEETING  
NAIROBI, KENYA, 20 - 21 SEPTEMBER 2018

## 1 Background

The world is increasingly recognising that challenges such as climate change, environmental degradation, unsustainable consumption and production practices and resource scarcity have a significant impact on economies and human health and well-being. The global economy is faced with multiple and significant pressures to reduce human and ecological risk factors in order to sustain humanity within planetary boundaries. In addition, the environment is increasingly being recognised as a provider of solutions for accelerated socio-economic transformation to solve systemic challenges of food insecurity, poverty, unemployment, as well as pollution and waste. The environment is also being recognised as a provider of solutions for the efficient and effective implementation of global commitments made through multi-lateral environmental agreements (MEAs). For effective implementation of global environmental commitments to address environmental challenges, there is a need to review and re-focus our development pathways. If the 'business as usual' approach continues, countries will not be able to respond to environmental challenges, thereby undermining the effective implementation of the 2030 Agenda for Sustainable Development and other related global commitments. It is significantly noteworthy that Africa, which possesses a vast array of abundant natural resources, is one of the most affected by environmental degradation and is one of the world's regions that is most vulnerable to climate change.

Subsequently, there is a growing call to find innovative approaches to help to address the challenges to sustainability while offering opportunities for improved human health and well-being, growth, cost reduction, competitiveness and prosperity. Moreover, the emergence of concepts like the green economy, blue economy and circular economy present opportunities to divert from business as

usual and to leapfrog to a sustainable development path. Harnessing the power, energy and environmentally-friendly technologies associated with these new economic pathways will assist in the attainment of economic growth, job creation and addressing inequality in the continent.

The Sixteenth Ordinary Session of African Ministerial Conference on the Environment (AMCEN) took place from 12 – 16 June 2017 in Libreville, Gabon, and was held under the auspices of the African Union (AU) and the United Nations Environment Programme (UNEP) under the theme: "Investing in Innovative Environmental Solutions to accelerate implementation of Sustainable Development Goals and Agenda 2063 in Africa". The African Environment Ministers recognised that the African Continent needs practical, innovative ways by which the environment can be leveraged to directly accelerate the achievement of the Sustainable Development Goals (SDGs) and actualize the shared Agenda 2063 aspirations. This calls for the continent to undertake innovative investments that could unlock the catalytic contribution of the environment to actualize the achievement of the SDGs and the implementation of Agenda 2063.

At the AMCEN 16th Ordinary Session, Ministers called for appropriate measures to promote and invest in innovative policy interventions, including replication, to sustain and improve the productivity of our natural capital to accelerate the achievement of the 2030 Agenda for Sustainable Development, the SDGs and Africa's Agenda 2063; to enhance innovative environmental mechanisms through different financing schemes, education, research and development, and private and public partnerships, among other efforts, to foster socioeconomic development, including through the sustainable use of Africa's natural resources; to promote the allocation of an adequate percentage of national or subnational revenues for investing in innovative environmental solutions and the sustainable use of natural resources.

Furthermore, the Ministers: called for the promotion of the development and the strengthening of partnerships between Governments, the private sector, non-governmental organizations, the international community and other relevant parties in order to promote and enhance investments in innovative environmental solutions; called upon all member States of the United Nations Environment Assembly to adopt, at UNEA-3, a universally applicable resolution on innovative environmental solutions in order to galvanize international action on the strengthening of sustainable management of natural capital; and called for promoting the incorporation of key elements of this decision and the key policy messages into regional, sub-regional, national and subnational policy, legislation and action.

It should be emphasised that the strengthened global partnership should take into account that countries are at different levels of development and should further re-commit developed countries to take the lead in advancing finance,

technical expertise and the necessary technology to developing countries in line with globally agreed commitments at various multi-lateral forums.

## **2 Key issues for discussion**

### **2.1 Green Economy**

The green economy can be viewed as a sustainable development path based on addressing the interdependence between economic growth, social protection and natural ecosystems. Recognizing that green economy could play a pivotal role in achieving sustainable growth in Africa, leaders from the continent have made strong commitments to set the national development paths towards long-term sustainable development. As of today, several countries have or are in the process of developing green economy strategies or action plans at the national level. This includes Burkina Faso, Egypt, Ethiopia, Ghana, Kenya, Mauritius, Mozambique, Rwanda, Senegal, Sierra Leone, South Africa, Uganda, Tunisia and Zambia. Countries have also succeeded in making green economy an integral part of national development planning. In Kenya, for instance, the Green Economy Strategy and Implementation Plan is part of the medium-term Plan for 2013-2017. This is based on the understanding that for a successful green economy transition, national development planning processes should be reframed in the context of green economy.

In order for the identified green economy opportunities to be realized, the appropriate policy environment should be put in place. With sound regulatory frameworks coupled with appropriate incentives, green investments could accord sustainable benefits more inclusively. Effective regulations, however, are contingent upon rigorous monitoring and enforcement mechanisms. Kenya, for instance, has instituted several effective policies for monitoring and compliance including: tax exemption on renewable energy and environmental regulations for biodiversity conservation, water quality, and waste management. While in South Africa, the National Development Plan (NDP) lays a strong foundation and framework for the country's green economy and sustainability trajectory, which states that by 2030, "South Africa's transition to an environmentally sustainable, climate change resilient, low-carbon economy and just society will be well under way".

A wide range of green economy policies are already being implemented across countries in the region. In particular, fiscal policy reform can open new space for growth, investment, and social protection – hallmarks of an inclusive green economy. At the same time fiscal policy can provide the necessary incentives to induce green investment and consumers' behaviour changes. South Africa, for example has already announced the introduction of a carbon tax policy framework.

The removal of harmful subsidies can also create fiscal space for new investments in green sectors and the provision of essential services. According

to the International Monetary Fund (IMF), reforming fossil fuel subsidies in Africa would free public resources amounting to 1.4 percent of the region's GDP. The government of Ghana, for example, removed fossil fuel subsidies in June 2013, freeing up public resources (about US\$1 billion per year) that will be used to implement inclusive green economy policies.

The Regional Flagship Programmes (RFPs) are initiatives of AMCEN, which have been formulated as a contribution to Africa's response to the outcomes of the United Nations Conference on Sustainable Development held in Rio de Janeiro (Rio+20). The outcomes underlined the political commitment for the promotion of sustainable development and called upon national governments and development partners to further strengthen and consolidate their efforts to effectively integrate the economic, environmental and social dimensions in their development policies and strategies. AMCEN, under the guidance of the African Union, has developed five RFPs as a means to ensure the effective implementation of the outcomes of Rio+20 including: the African Green Economy Partnership (AGEP); Sustainable Land Management, Desertification, Biodiversity and Ecosystems-based Adaptation to Climate Change (LDBE); Partnership for Sustainable Consumption and Production (SCP) in Africa; African Programme on Sustainable Energy Development; and Africa Integrated Environmental Assessment for Sustainable Development. The RFPs are implemented within the overall framework of the NEPAD Environment Action Plan.

The above represents some of the opportunities to change the current path and elevate Africa's development trajectory to a higher path. The role of Africa as a player in the international community is crucial and the fostering and development of international linkages with other continents are important.

## **2.2 Greening Africa's Cities**

According to the 2016 African Economic Outlook, over half of Africa will be living in cities by 2050, yet two-thirds of the infrastructure that would be needed for African cities by that time has not yet been built. Policy-makers are under pressure to ensure that this rapid expansion does not result in enormous, unsustainable slums, but rather in development, opportunity and growth.

Therefore, the innovation solutions will require a shift in policy and regulatory instruments, financial mechanisms, skills reforms, planning designs and behavioural shifts from both business and civil society in general. Africa remains the World's poorest Continent and is home to 75% of the world's poorest countries. Changing this condition will require investment and innovation. It is estimated that African countries will need to spend up to 7% of GDP – or at least \$100bn each year – on public infrastructure to alter our future and to steer towards a positive developmental trajectory. For the Continent to achieve its

developmental aspirations as contained in Agenda 2063, joint collaboration and partnerships are key to ensure African prosperity and for the Continent to attain the Sustainable Development Goals (SDGs).

An area of innovation which will result in gains for the Continent is in our urban spaces. Making African cities more attractive places for investment and innovation must be a priority for policy-makers. Policy-makers must work to provide the infrastructure and services, not only for a better quality of life, which is vital in attracting and keeping people in the cities, but also to create opportunities for economic development. Successful cities of the future will be those that also invest in the development of safe, secure and green environments for their people. There is growing evidence that green spaces in cities play a key role in boosting health and productivity. With the right leadership and foresight, the continent can sustain and replicate its successes, learn from others and leapfrog to new levels of prosperity. The scope is large for new, wide-ranging urban policies to turn African cities and towns into engines of sustainable societal, structural, environmental and economic transformation.

### **2.3 *Blue/Oceans Economy***

Africa's inland waters, oceans and seas are under environmental pressure. Over the years, traditional maritime activities, such as shipping and commercial fishing have intensified, while new ones, such as aquaculture and offshore oil and gas extraction have emerged. However, the rise in intensity of activities at sea is taking place against the backdrop of insecurity, various forms of illegal trafficking, degradation of the marine environment and declining biodiversity, with the latter being aggravated by the effects of climate change. In the past decades direct aggregate losses of revenue from illegal activities in Africa's Maritime Domain amount to hundreds of billions US dollars, not to mention the loss of lives as stated in the 2050 Africa Integrated Maritime Strategy.

With 38 coastal and island states, 13 million km<sup>2</sup> of collective exclusive economic zones (EEZs) and a coastline of over 47,000 km there is an enormous untapped potential for African countries, and for the African continent as a whole, to develop the sectors typically associated with the "blue economy." For example, expanding sustainable fisheries, aquaculture, tourism, transportation and maritime and inland ports can all help to reduce African poverty and enhance food and energy security, employment, economic growth and exports, ocean health and sustainable use of ocean resources. More than 12 million people are employed in fisheries alone, the largest of the African blue economy sectors, providing food security and nutrition for over 200 million Africans and generating value add estimated at more than US\$24 billion or 1.26 percent of the GDP of all African countries.

Recognizing the breadth of economic potential, extensive coastline and abundance of maritime resources, the African Union, in 2014, endorsed the 2050

Africa Integrated Maritime Strategy (2050 AIM Strategy), a long-term strategic vision for the development of Africa's blue economy. This strategy proposes developing a combined African EEZ, which could be viewed as a strategic governance framework to contribute to the development of the African Blue/Oceans Economy.

In line with the 2050 AIM Strategy, several African countries have developed or are in the process of developing national blue/ocean economy strategies and programmes. For example, South Africa's blue economy strategy, entitled "*Operation Phakisa: Unlocking the Potential of the Ocean Economy*," was launched in 2014. Closely linked to South Africa's 2030 National Development Plan, this Ocean Economy Operation Phakisa focuses on several priority maritime areas, including marine transport and manufacturing, aquaculture and marine protection services and ocean governance. The strategy has used sectoral growth targets and prioritized maritime skills and education to attract public-private partnerships and international private investors. Operation Phakisa's objective is to create one million new jobs and add a further 177 billion rand to the GDP by 2033. Already, 24 billion rand in blue economy investments have been secured, allowing for the creation of 6,400 new jobs and the establishment of a substantial boat export and Repair Park, the South African International Maritime Institute and a skills development programme.

Since 2014, Mauritius has integrated the blue economy within its National Development Programme. The country has established a dedicated blue economy ministry and a consultative entity, the National Ocean Council, to provide continuing stakeholder input. Mauritius has also developed a blue economy roadmap.

#### **2.4 Circular Economy**

The global economy has mainly operated on a 'take-make-dispose' approach since the advent of the Industrial Revolution. Circular economy aims to redefine growth, focusing on positive society-wide benefits. It entails gradually decoupling economic activity from the consumption of limited resources, and designing waste out of the system as waste is the result of inefficient processes. Underpinned by a transition to renewable energy sources, the circular model builds economic, natural, and social capital. It is based on three principles: Design out waste and pollution, keep products and materials in use and regenerate natural systems. It responds to the aspiration for sustainable growth in the context of the growing pressure of production and consumption on the world's resources and environment.

The Circular Economy concept is designed to keep resources within the economy when a product has reached its end of life, so that it can be productively used again and again and hence create further value. Transitioning to a circular economy does not only amount to adjustments aimed at reducing the negative impacts of the linear economy. Rather, it represents a systemic shift that builds

long-term resilience, generates business and economic opportunities, and provides environmental and societal benefits. It should be noted that the Circular Economy concept goes beyond only addressing waste matters, it also encompasses how nature optimizes resource use with minimal wastage, and can be applied to water management, ecosystem or catchment management and even city management as well.

Rwanda, South Africa, Nigeria, the United Nations Environment Programme and the World Economic Forum have collaborated to develop a continent wide alliance, known as the African Circular Economy Alliance which aims to spur Africa's transformation to a circular economy which is expected to foster economic growth, jobs and positive environmental outcomes. The African Circular Economy Alliance was officially launched during the 23<sup>rd</sup> Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC COP23) in Bonn, Germany in November 2017.

## **2.5 Renewable energy – innovation in application**

Africa has enviable renewable energy resources including a world leading solar energy resource, excellent wind resources (both terrestrial and offshore), biomass, hydro and even thermal energy. Furthermore, with relatively low levels of electricity generation and transmission infrastructure, Africa has the greatest opportunity to leapfrog dirty and destructive fossil fuel technologies to sustainable, clean and increasingly cost-effective energy technologies. This jump to modern energy supply and provision will not only increase Africa's energy security and competitiveness in an increasingly carbon-constrained world, but will also provide a meaningful contribution to crucial global greenhouse gas emission mitigation efforts.

Although Africa's energy transition advantages are recognised, they are still to be fully explored and exploited. The Paris Agreement secured commitments by a global alliance to mobilize up to US\$1 trillion in solar investments. It was recognised at the launch of the Africa Renewable Energy Initiative (AREI) that the AREI has the potential to catalyse climate mitigation for development in Africa and US\$10 billion was pledged. The Initiative is intended to be a transformative and Africa-led effort to accelerate and scale up the harnessing of the continent's huge renewable energy potential. The Initiative aims to deliver 10 gigawatts (GW) of new and additional renewable energy generation capacity by 2020 and to mobilize African potential to generate at least 300 GW by 2030. Globally, the renewable energy sector created 7.7 million jobs in 2015, an 18 per cent increase from 2014.

Notwithstanding these initiatives and acknowledging the need for continent-wide transmission networks to fully exploit and stabilise renewable energy supply, the African challenge is to go beyond the traditional 'large power station – large grid' models, best suited to countries that already have large scale investments in this type of infrastructure, and to explore the flexibility afforded by renewable energy

to deliver high quality energy services. With this, Africa could, indeed should, lead global innovation in areas of affordable roof-top solar, smart grids, smart metering and mini-grids. Unpacking the slogan “renewable energy is people’s power” into innovative applications of renewable technology holds great promise for urban and rural communities alike.

## **2.6 *Water demand-side management***

The water sector in Africa is very sensitive to changes in climate and prolonged climate variability. Climate change is expected to alter the hydrological cycle, temperature balance, and rainfall patterns across Africa and thus has the potential to add to existing pressure on water availability, accessibility, and demand, thereby affecting economic development, ecosystems, and biodiversity. Even in the absence of climate change, present population trends and patterns of water use indicate that more African countries will exceed the limits of their economically usable, land-based water resources before 2025. However, climate change will not have uniform impacts on water resources across the continent. In some parts, it will aggravate water stress while in others it will reduce it. Water management is a pressing challenge, which, if not improved now, could see its problems greatly exacerbated in a future, warmer climate.

As for energy, although acknowledging the need for large scale water storage and reticulation infrastructure, the African challenge is to go beyond the traditional supply-side focus and to explore the innovative approaches to climate resilient water capture, storage and use. With this, Africa could, indeed should, lead global innovation in areas of affordable rain water harvesting, smart irrigation, water-smart sanitation and ecological infrastructure for water security. Furthermore, harnessing Africa’s renewable energy wealth to improve our water security would be a win-win sustainable development innovation.

## **2.7 *Combatting plastic pollution***

Recent studies on the amount and nature of plastic that is ending up in the ocean, as well as the ecosystem impacts associated with this modern source of pollution have caused an increase in public awareness of the issue and concern about how to tackle it. Eighty percent of plastic that ends up in the ocean is getting there through land-based sources. In a world that produces 300 million tons of plastic per year and about eight million tons of that ending up the ocean, from where it is almost impossible to retrieve, the issue of plastic pollution has become a global concern. The solution to the majority of plastic pollution in the ocean starts on land, and while we are only just coming to terms with the scale of the problem, we are also looking for innovative, collaborative solutions.

Plastic is often regarded as a ‘miracle’ material that is now ubiquitous and a valued and intrinsic part of our lives. Unfortunately, plastic’s astonishing properties of durability and flexibility means that it is used everywhere, even where its use may not be appropriate. Using a material that is virtually non-



biodegradable within a human generation as, for example, single-use packaging material, is clearly problematic, especially in countries with less than optimal waste management practices and services. Although many plastics are potentially fully recyclable, the use of this material for a single use runs counter to the circular economy concept as the waste management infrastructure required to fully close the loop would simply be uneconomical. Thus, although there is a great opportunity for innovation in the plastic waste management and recycling arena, the real innovations will be in the area of sustainable packaging and the appropriate use of plastic.

Several countries including Rwanda, Kenya and South Africa are currently on the drive to intensify the war against plastic pollution, the initiatives includes revising the current law on plastic products with the goal of banning single-use plastic materials such as straws, disposable cutlery among others and education and awareness.

## **2.8 *Fourth Industrial Revolution – opportunities and challenges for Africa***

The impact of the world economy headwinds over the past decade for commodity-dependent countries such as many in Africa, has refocused attention on the urgency of economic diversification, revitalization of manufacturing and the harnessing of human potential and innovation. The Fourth Industrial Revolution (4IR) is described as the fourth major industrial era since the initial Industrial Revolution of the 18th century.

The Fourth Industrial Revolution is characterised by a range of new technologies that are fusing the physical, digital and biological worlds, and impacting all disciplines, economies and industries. This includes advances in digitization and Artificial Intelligence (AI) which have significant implications for the shaping of the global economy, improving natural resource management and a broader role for advances in biological technologies. Central to this revolution are emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, remote sensing, autonomous vehicles, 3D printing and nanotechnology. Therefore, this revolution offers new opportunities to achieve inclusive and sustainable growth by fast-tracking market integration in Africa through industrial corridors and technological innovation. However, the 4IR may also present challenges for Africa due to the Continent's dependence on commodity and raw material exports, which is a key issue requiring engagement, particularly in the context of the environment.

### 3 Key questions

- What is required to leverage and scale up the circular economy in Africa?
- How do we promote and manage responsible consumption and production in Africa?
- How can we leverage our renewable energy wealth to deal with other social, economic and environmental problems like water security?
- How can minimising the negative environmental impacts from consumption and production systems, whilst promoting a life-cycle approach, particularly with respect to single use plastics be achieved in Africa?
- What are the priority areas for Africa to realise the opportunities for accelerating low carbon action and to manage the risks associated with the impacts of climate change as well as to develop new or enhanced public and private sector partnerships to accelerate climate related programmes on the African Continent?
- What is required to create jobs and employment opportunities through investing in the environment and the green economy?
- Without destroying or degrading our fisheries, what are the key enablers to the development of the Blue/Oceans Economy in Africa?
- What are the key opportunities and enablers within the 4<sup>th</sup> Industrial Revolution improve environmental management in Africa and what are the implications of the 4<sup>th</sup> Industrial Revolution for the Continent from an environmental perspective?
- How can remote sensing and 'big data' be harnessed for Africa's sustainable development transition?