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About The International Journal On Green Growth And Development

The International Journal on Green Growth and Development is an effort to stir a debate around emerging 'green' concepts and development. The publication aims at building knowledge through stakeholder engagement on policy-relevant issues to understand the many facets of green growth and development. It is a step towards a forward-looking knowledge process for new opportunities linked with sustainable growth and development. The journal showcases new research through peer-reviewed articles, opinions, and innovative practices. The new journal builds on the previously published *Green Growth and Development Quarterly*.

The publication aims to cover the following topics:

- Mainstreaming environmental sustainability in development policy
- Financing green growth
- Fiscal policies
- Business and green growth
- Post-growth thinking
- Policies on global and local environment
- Sustainable development policy
- Sustainable consumption and production
- Natural resource management
- Integrated assessments
- Energy policy
- Engaging stakeholders
- Regional issues

About this issue

This thematic issue of The International Journal on Green Growth and Development voices interdisciplinary analyses, policy interventions and grassroots initiatives on green growth and development in Africa. The issue draws on these divergent voices not only to advance diversity of perspectives but also to bridge the gap between theory and praxis.

About the organization

The Energy and Resources Institute

The Energy and Resources Institute (TERI) was established in 1974. All activities in TERI, the largest developing-country institution working towards sustainability, move from formulating local- and national-level strategies to shaping global solutions to critical issues. For more information, visit www.teriin.org.

Editorial

The challenge of finding new paradigms of global development has become more exigent as climate change exacerbates the conditions of poverty and inequity. The status quo threatens sustainable economic growth, which is essential if Africa is to deliver on basic services and infrastructure, address poverty, build livelihoods, and improve the quality of life. As an intervention, ordinary people from different walks of life are pioneering innovative growth models. This is a laudable development considering that the conventional replication of patterns of production and consumption from the global North has left Africa enduring adverse environmental and societal hazards. Echoing new ways, the Rio+20 Summit recognised and emphasized a transition towards a green economy where planetary boundaries serve as the reference point for development. This transformation has to be pursued globally regardless of a country's level of development—it is a call to action for industrialised, newly industrialising, and even developing countries. Thus, the world is called to focus on inclusive economic growth whilst maintaining the healthy functioning of the earth's ecosystems. Fundamentally, sustainability calls for a new definition of development, change in lifestyles, and huge upfront investments in green technologies. Can a continent largely consisting of poor developing countries lead the world on climate resilient and low carbon development?

This Special African Issue voices interdisciplinary studies and grass-root initiatives on green growth and development in Africa. The issue draws on these divergent voices not only to advance diversity of perspectives but also to bridge the gap between theory and praxis. Wanjala Nasong'o, for instance, captures the dynamics of Africa's intricate development challenge in "Environmental Policy and Practice in Kenya: Between Cornucopians and Neo-Malthusians"; Fanwell Bokosi views resource governance as key to Africa's social, economic, and political transformation in "African Forum and Network on Debt and Development: Natural Resources and Financing Development"; Eugenie Drakes and Howard Drakes restore age-old traditions by creating a market for ancient art within the contemporary world in "The Basket as Bridge—Weaving Human Exchange." The same finds resonance in a continental institution and policy making body when the African Union recognises and gives precedence to the African value system in "The Role of Culture in African Renaissance, Integration, and Sustainable Development".

Africa still strives to uphold its frugal and symbiotic relationship with nature despite global production and consumption patterns. To this end, Rwanda's Green Fund—known locally as FONERWA—highlights Africa's commitment and leadership towards issues of adaptation, mitigation, and environmental protection.

In concurrence, a review of the Africa Progress Executive Report—"Global Goals, African Realities: Building a Sustainable Future for All"—confirms the possibilities for the continent to lead the world in sustainable development. We hope this Special African Issue inspires sustained conversation, commitment, and agency towards alternative growth models.

Editorial Team

ARTICLE

Environmental Policy and Practice in Kenya: Between Cornucopians and Neo-Malthusians

WANJALA S NASONG'O[1]

Abstract: *The issue of environmental protection and preservation has assumed great importance and urgency in the contemporary international system, especially following the 1972 United Nations Conference on the Human Environment. Kenya's effective participation at this conference saw it successfully lobby to host the headquarters of the newly formed United Nations Environmental Programme, the only United Nations agency so far to be located outside Europe and North America. Since then, Kenya has implemented a number of initiatives aimed at protecting and preserving its ecological system. This article explores and evaluates the imperatives of environmental policy and practice in Kenya from the perspective of two competing approaches to the environmental problematic—neo-Malthusianism which argues the case for environmental protection to ensure sustainable development and Cornucopianism which views the environment instrumentally for the utility it provides and seeks to exploit with abandon. The tension between these two contending tendencies has been at work in Kenya, though the neo-Malthusian one seems to be more at the forefront than the Cornucopian one. The article argues that there is urgent need in Kenya to strike a balance between exploiting the developmental utility provided by the environment and preserving the same to ensure sustainability.*

Keywords: *Kenya, Environment, Sustainable development, Cornucopianism, Malthusianism*

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Introduction

It is largely irrefutable that the natural environment has been adversely affected by the activities of human beings in their quest for subsistence and development. This eventuality has resulted from, among other factors, the explosion of human population across the world and the rapidity with which it continues to increase; the failure of societies to effectively control the technologies available to them and use them sustainably, in ways that would not destroy the environment; environmental illiteracy and stark ignorance of ecological rules that should govern land use and natural resource exploitation; and the inability or unwillingness of individuals to control their use of land and other natural resources so as to maintain them within the capacity of the biosphere to provide continuing support for life. In spite of this reality, for a long time, some advocates of development and policymakers in developing countries have argued that concern for the environment is a luxury which only developed countries can afford. In this view, environmental preservation and conservation, issues of 'going green,' can only be afforded out of the proceeds of development. By the end of the twentieth century, however, there emerged increasing recognition that the kind of development that pollutes and sometimes undermines the ecosystem, the very mechanism that supports life, is inimical to development worth of the name (Attfield 1994: 133). Taking cognizance of the fact that "we have pushed the world to an utterly unprecedented condition," Ferre posits that we are living in a "post-natural world" in which we have so tampered with the atmosphere that it has had a devastating impact on the weather (Ferre 1994: 238). Temperatures and rainfall are no longer to be entirely determined by some separate, uncivilized force; instead, they have become partly a product of our habits, our economies, and our ways of life. Against this background, Ferre (1994) declares that we are condemned to be morally responsible towards the environment. Johnson (1999) adds that the unruly demolition of forests and natural resources, the gradual dissipation of variegated biological species, soil degeneration, the effects of global warming, pollution, and the destruction of the ozone layer, make the preservation of the environment compelling if only for prudential reasons. In Johnson's view, it is mandatory for the present generation to protect the natural environment for future generations.

This article seeks to probe and analyse the contested nature of the nexus between the development process and the evolution of environmental policy in Kenya. Based on archival research in Kenya and the US, the article proceeds within the framework provided by two competing approaches to the environmental problematic—Cornucopianism and neo-Malthusianism. It is noteworthy that the direct result of the general concern for the environment are concerted initiatives, in Kenya as elsewhere globally, for the protection and conservation of the natural world, an approach that is rooted in the neo-Malthusian perspective. Yet, proponents of these initiatives for the protection and preservation of the environment find themselves confronted by contrarian forces that argue, from a Cornucopian perspective, that deliberate efforts to preserve the environment are misplaced and

a waste of time. To them, to argue that human activities have negatively affected the ecological rhythm and that these need to be institutionally restrained, amounts at best to crying wolf and at worst, to environmental scaremongering. We should, they argue, continue to exploit the natural environment with abandon and whatever negative consequences, if any, will be taken care of as and when they arise by the magic of technology and the ingenuity of free market forces. In the following sections, I map out the key arguments of the Cornucopian and neo-Malthusian schools and then apply these schools of thought to the emergence and development of environmental policy and practice in Kenya. The article concludes that given the tension between the neo-Malthusians and the Cornucopians in the Kenyan context, it is essential to strike a balance between the country's development needs and the imperatives of ecological preservation.

Sketching the Conceptual Cornerstones: Cornucopians vs Neo-Malthusians

The Cornucopian School

Cornucopianism and neo-Malthusianism are two diametrically opposite perspectives on environmental issues. Cornucopians contend that there is no moral or practical need for institutional mechanisms to protect the natural environment or limit its exploitation. They hold an anthropocentric view of the world in which human beings are seen as separate from and superior to everything else in the universe and that all other entities have value only as long as they can be exploited for the benefit of humans. Cornucopians, such as Julian Simon (Simon 1981, 1990) and Herman Kahn (Kahn 1976), reject the view that population growth is problematic and that the earth has finite resources and thus, a limited carrying capacity. To them, capitalism and technological innovation are the answers to all problems. According to Jo Arney, a cornerstone of the Cornucopian perspective is denial of Thomas Malthus' argument that human population growth will always tend to outstrip the supply of food and natural resources since populations grow geometrically (by multiplication) while economies grow arithmetically (by addition) (Arney 2014). This Malthusian position led Paul Ehrlich to fervently call for population control failing which, he predicted, millions would starve to death in the late twentieth century due to overpopulation (Ehrlich 1971). Cornucopians argue that although the world's population has grown tremendously since the nineteenth century on account of medical and technological advances, it has since slowed and evened out partly as a result of the invention of the contraceptive pill that facilitated family planning. Cornucopians note that the standard of living has grown in tandem with population growth and argues therefore, that population growth is actually more likely to improve the human condition than harm it.

Holding the view that technology can help regenerate or replace any resources under stress, Cornucopians reject the idea that the earth has finite resources.

They point to the discovery of fiber optic cables that replaced metals, such as copper, in electrical wiring and communication lines to buttress their viewpoint. Furthermore, they challenge the concepts of 'carrying capacity' and 'the tragedy of the commons,' the very basis for environmental protection advocacy. American ecologist Garrett Hardin evaluated the idea of carrying capacity in relation to environmental social goods like clean air and clean water and posited that without government regulation, people, acting rationally at the individual level, would maximize their own utility but end up destroying the common goods shared by all but owned by none (Hardin 1968). However, Cornucopians reject this position arguing, á la Adam Smith, that people acting as individuals in the market place for their own gain tend to contribute to the welfare of all by increasing available revenue and thus improving social welfare for all (Smith 2007 [1776]). They, thus, argue the case for minimal government regulation and place a high premium on individual liberty, the fulcrum of market growth, and technological development. To Cornucopians, private property is key to the flourishing of markets and the only legitimate role for government with regard to resources is the protection of private property, not control and regulation of the exploitation of nature. They are, thus firm believers in Adam Smith's 'invisible hand' logic of market forces (see Simon and Kahn 1984).

Julian Simon, perhaps the most prominent and most committed cornucopian of all time, systematically argued against the rise of neo-Malthusianism in the second half of the twentieth century. In his study of population, the environment, and technology, Simon (1990) articulated what Aligica (2009) calls the elements of a complex alternative social philosophy in which evolution, social exchange, and creativity play pivotal roles. In this worldview, human creativity enables human beings to be different from the rest of the animal world and to create complex orders based on ideas and exchange. The institutions humans set up allow them to avoid nature's (neo-Malthusian) traps. Consequently, the notion that nature puts a clear-cut limiting condition on growth is a simplistic and misleading premise for public debates and governmental decisions (see Aligica 2009: 73). Simon (1990: 1) sees a world in which raw materials and energy are less scarce and the food supply of the world is improving even if its distribution is not; where pollution is on the decline, the US needs more immigrants; and the globe, in the long term, needs more, rather than less, people. In this view, population growth and increase in demand for both raw materials and finished products are intrinsically linked, creating shortages that force prices up, spurring the invention of substitute materials, technologies, and creating niches in which new ideas flourish. Humans, in Simon's view, create more than they destroy. He believed that economics and resources are not zero-sum situations in which the gains of one are offset by the losses of another, but held instead, that the quantity of resources grows in response to human efforts (Simon 1990: 7; Rothman 1992: 84). According to Simon, more of anything is better. He supported unlimited immigration to the US arguing that immigrants, even illegal ones, contribute more to the American society than they take from it (Rothman 1992: 85).

Cornucopians are environmental optimists who do not worry very much about protecting the stock of any single resource because of their faith that market-driven human ingenuity can always be tapped to allow the substitution of more abundant resources to produce same end-use service. As Simon (1981: 345), the ultimate Cornucopian, says, "There is no physical or economic reason why human resourcefulness and enterprise cannot forever continue to respond to impending shortages and existing problems with new expedients that, after an adjustment period, leave us better off than before the problem arose." Herman Kahn (1976), went so far as to argue that even if the world's population grew to 30 billion in the next 200 years (by 2176) and global economic activity grew by 60 times, the levels of the mid-1970s, there will still be abundant energy, raw materials, food, living space, and increasing affluence worldwide, with no unacceptable effects on the environment. Cornucopians are thus geographical possibilists who hold that the natural environment can be modified; that human free will ultimately determine the options available (Nasong'o 2012: 229).

The Neo-Malthusian School

Neo-Malthusianism is a school of thought that advances the argument that overpopulation is likely to increase the depletion of the world's resources and environmental degradation to unsustainable levels with the ultimate effect of ecological collapse and other environmental catastrophes. According to Shah (2015), Thomas Malthus, writing at the end of the eighteenth century, pioneered the fundamental theory of population growth. According to the theory, population grows at a geometric rate (by multiplication — 1-2-4-8-16-32) while food supply grows at an arithmetic rate (by addition — 1-2-3-4-5-6). Populations thus tend to grow at a much faster rate than what the natural resources can provide for. In Malthus' view, the gap between the rates of increase of population and food supply results in what he called 'positive' conditions such as wars, famines, and epidemics that help check overpopulation. Malthus was against birth control methods, including abortion, as strategies for managing population growth. In their place, he suggested preventive measures such as educating the lower classes, higher pay for lower classes, and prolonged celibacy or postponement of marriage. All in all, Malthus held that the tension between population and resources was the major source of misery for human beings (Malthus 1798; Shah 2015).

Neo-Malthusians emerged in the second half of the nineteenth century to emphasize two points. First, that advancements in medical technology had facilitated population growth across the world; and second, that this population growth could outstrip the supply of resources in general, such as oil, energy, and water, not just food supply as originally elaborated by Malthus. In their view, since most of the resources, such as energy and oil, come from non-renewable sources, the envisaged environmental catastrophe appeared dangerously imminent. As Shah (2015) writes, Neo-Malthusians were not simply focused on campaigning in support of birth control, but they had a particular perspective on the effects of population on human conduct and behaviour. They went so far as identifying the

working class with the problematic of overpopulation. Paul Ehrlich, a prominent Neo-Malthusian writing in 1968, went so far as to predict that the fight to feed the world's humanity was over and that hundreds of millions would starve to death in the 1970s and 1980s (Ehrlich 1971). As Garrett Hardin wrote, a finite world can only feed a finite population hence population growth must eventually equal zero if the world's carrying capacity is to be maintained or the notion of the greatest good to the greatest number approximated (Hardin 1968: 1243). Garrett went on to elaborate the negative consequences of the exponential growth of population (what he called 'the population bomb') on the carrying capacity of natural environmental resources, such as pastureland, clean water, and clean air. According to him, without government regulation, human beings, acting rationally at the individual level, would maximize their own utility but end up destroying the common goods shared by all but owned by no one. Arguing that no technical solution could rescue humanity from the misery of overpopulation, Hardin argued the case for abandoning the commons in breeding: "The only way we can preserve and nurture other and more precious freedoms is by relinquishing the freedom to breed, and that very soon" (Hardin 1968: 1248).

A strong warning on the limits of economic growth came from The Club of Rome, a think tank of scientists, economists, businesspeople, international civil servants, and politicians from five continents. The thirty people making up the group were united by their overriding conviction that the major problems facing mankind were of such complexity and were so interrelated that traditional institutions and policies were no longer able to cope with them, or even to come to grips with their full content. The purposes of the Club of Rome were to foster understanding of the varied but interdependent components—economic, political, natural, and social—that make up the global system in which we all live; to bring this new understanding to the attention of policy-makers and the public worldwide; and in this way to promote new policy initiatives and action (Meadows *et al.,* 1972: 8–9). The Club's book on the predicament of mankind entitled *The Limits to Growth* (see Meadows *et al.*, 1972) is reported to have sold 12 million copies in thirty-seven languages. The book argued that if the world's consumption patterns and population growth continued at the same rates of the time, the earth would reach its carrying capacity limits within a century (by 2070). The book noted, however, that this eventuality was not inevitable if people changed their policies and did so sooner than later. However, both capitalist and communist establishments largely ignored the warnings of the Club of Rome, dismissing their book as alarmist and overly pessimistic, Suter (1999) notes that the first ministries of the environment were established at this time with the introduction of tougher environmental laws.

Cornucopians vs. Neo-Malthusians: A Synthesis

Homer-Dixon (2002) argues that historically Cornucopians have been right in their criticism of the idea that resource scarcity places fixed limits on human activity.

Time and time again, he argues, humans have circumvented scarcities and neo-Malthusians have been accused of 'crying wolf'. Nevertheless, Homer-Dixon notes, in assuming that this experience pertains to the future, Cornucopians overlook a number of factors: (i) Serious scarcities of critical resources in the past usually occurred singly, now we face multiple scarcities that exhibit powerful, interactive feedback and threshold effects making the future highly uncertain for policymakers and economic actors; (ii) In the past, the scarcity of a particular resource usually increased slowly, allowing time for social, economic, and technological adjustment. However, now populations are much larger and human activities much more resource-intensive, hence debilitating scarcities develop much more quickly; (iii) Today's consumption has far greater momentum than in the past because of the size of the consuming population (from one billion people in 1900 to 7.4 billion in 2016), quantity of the material consumed, and density of consumption activities; (iv) The free market price mechanism is a bad gauge of scarcity, especially for resources held in common like a benign climate and productive seas; (v) Market-driven adaptation to resource scarcity is more likely to succeed in wealthy societies where abundant reserves of capital, knowledge, and talent help economic actors invent new technologies, identify conservation possibilities, and make the transition to new production and consumption patterns. In spite of efficient markets, however, poor countries lack capital and knowledge to deal with these problems; (vi) Cornucopians have an anachronistic faith in humankind's ability to unravel and manage the myriad processes of nature. There is no *a priori* reason to expect that human scientific and technical ingenuity can always surmount all types of scarcity. Humans may lack the mental capacity to adequately understand the complexities of environmental-social systems. Rather than inspire the wave of ingenuity predicted by Cornucopians, therefore, future environmental problems may instead reduce the supply of ingenuity available in society (Homer-Dixon 2002: 502–503).

Neo-Malthusians are environmental pessimists who are much more cautious and distinguish between 'resource capital' and 'resource income.' The capital is the resource stock that generates a flow (income) that can be tapped for human consumption and wellbeing. A sustainable economy is one that leaves the capital intact and undamaged so that future generations can enjoy an undiminished income stream (Nasong'o 2012: 228; Homer-Dixon 2002: 502; Dabelko and Dabelko 1996: 23–49). Failure to apply a sustainable approach to environmental management and natural resource use, Neo-Malthusians warn, along with the global convergence of environmental, energy, and political stresses could lead to the collapse of social order at the national and global levels (Homer-Dixon 2006).

Environmental Policy and Practice in Kenya: Neo-Malthusians Confront Cornucopians

In Kenya, the executive in the form of the presidency and the civil bureaucracy

has tended to play a greater role in public policy formulation than the other state institutions, including the legislature. The executive has quite often shared this role with international and domestic capital (Goodland and Ledec 1993: 27). The process of policy making in Kenya has tended to fall within the model of incrementalism whereby policy makers do not drastically alter existing polices but instead gradually improve and build upon them. With regard to the environment, Odhiambo (1994) observes that environmental concern has been a result of the impact of the interface among technology, environment, and society. Society comprises what Edwards (1993) calls 'Homo Economicus' (economic man) who has always been selfishly interested in his own personal satisfaction (personal utility) while at the same time remaining indifferent to where that satisfaction comes from. This state of affairs has created environmental problems, which, as Paehlke and Torgerson (1993: 226) point out, are perceived as being multi-dimensional, interconnected, interactive, and dynamic.

Kenya's basic objective since the dawn of political independence in 1963 was to attain a high and growing per capita income and to have the same equitably distributed so that all Kenyans are freed from want, disease, and exploitation. It was recognized that the achievement of these developmental goals required the efficient utilization of available resources, including technology, human resources, and natural resource inputs such as land, water, minerals, and forests. Over time, it became apparent that while these implied developmental activities conferred benefits to individual Kenyans and the country at large, they simultaneously had the tendency of generating diseconomies in the form of soil erosion arising from excessive cultivation or overgrazing, gaseous emissions, liquid effluent, and toxic accumulations from industrial activities, all of which end up polluting the environment. These generated efforts focused on ensuring an equilibrium between development activities and environmental conservation for purposes of actualizing the concept of sustainable development which emerged in the vocabulary of development management in Kenya in the latter half of the 1980s. According to Goodland and Ledec (1993), sustainable development is a pattern of social and structural transformation which optimizes the economic and other societal benefits available in the present without, at the same time, jeopardizing the likely potential for similar benefits in the future. A primary goal of this approach to development according to the two scholars is to achieve a reasonable and equitably distributed level of economic wellbeing that can be perpetuated continually for many human generations. "Sustainability implies a transition away from economic growth based on depletion of non-renewable resource stocks and towards progress (improvement in the quality of life) based more on renewable resources over the long run" (Goodland and Ledec 1993: 251). Hence, the deliberate policy choice on the part of Kenya is to utilize the environment on a sustainable yield basis as a means of ensuring continuity of the sources of the country's potential wealth.

Nevertheless, from the time of Kenya's independence in 1963 to 1974, there was not much concern for the environment at the governmental policy level. In

fact in the country's first two development plans for the periods 1965/1970 and 1970/1974, no explicit mention of environmental policy was made. Nonetheless, the policy makers acknowledged the role of forests as a valuable natural resource, pointing out that by then there was approximately 6,000 square miles of indigenous forests serving the important functions of protecting soil and water drainage areas and of supplying local timber requirements. It was noted that "without forests to protect its drainage areas, much of Kenya's land would be less valuable and a considerable potential for economic development would be lost" (Republic of Kenya, 1972: 221).

It is arguable, however, that the emphasis by government at this particular moment on a policy of planting 12,000 acres of fast growing coniferous and hardwood forests per annum was based more on the need for adequate supply of timber than on considerations of environmental conservation. The target was based on the United Nations Food and Agricultural Organization's estimates to the effect that by the year 2000, East Africa would be consuming 84 million cubic feet of saw and veneer logs and 37 million cubic feet of pulp wood per annum; and the recommendation thereof that Kenya's target of 300,000 acres of coniferous plantations by the year 1980 would have to be raised in order to meet the country's needs for saw and veneer logs by the turn of the twenty-first century. By and large, concern for environmental issues in Kenya from the policy standpoint can be categorized into the neo-Malthusian and the Cornucopian schools.

The Kenyan Neo-Malthusians

Among the foremost neo-Malthusians in Kenya was an ad hoc Working Committee on the Human Environment, which prepared a major policy paper on the environment that was presented at the 1972 United Nations Conference on the Human Environment held at Stockholm, Sweden. The paper identified environmental problems and outlined conservation measures to be implemented and to act as a basis for future development planning by the government. It is argued that this policy paper played a crucial part in the decision by the United Nations General Assembly in December 1972 to locate the headquarters of the newly created United Nations Environmental Programme (UNEP) in Nairobi, the only United Nations agency headquartered in a developing country. Notably, however, UNEP could not have been headquartered in Kenya had it not been for the work of Kenya's then ambassador to the United Nations, Joseph Odero-Jowi, with the advice of then Kenya's ambassador to Sweden, Joseph Muliro, and the support of Njoroge Mungai, the then Minister for Foreign Affairs, Kenya. Following the decision at the Stockholm Conference to establish UNEP, Odero-Jowi returned to the United Nations with clarity of purpose to lobby for the location of the new United Nations agency in Nairobi. Six other cities placed their bids, including Geneva, Kampala, London, Madrid, Mexico City, New Delhi, New York, and Vienna. However, Odero-Jowi moved fast in effectively lobbying delegates and presenting a compelling case for Nairobi, a city with "a crisp, pleasant, and

healthy climate, a big international conference center (KICC) near completion, an international airport, and excellent telecommunications" (see *Daily Nation*, August 26, 2013). Soon the African and Caribbean delegations fell in line behind Kenya. The Indian delegation also dropped its bid to support Kenya "in the interests of cordial and brotherly relations." As the *Daily Nation* (August 26, 2013) reports: "It took months of diplomatic maneuvering and delicate negotiations to bring the headquarters of the United Nations Environment Programme (UNEP) to Nairobi. The man at the centre of this unprecedented diplomatic coup, to have the first global intergovernmental organisation located outside the US and Western Europe, was Kenya's ambassador to the United Nations at the time, Joseph Odero-Jowi." Nairobi became, and remains, the environment capital of the world.

The effectiveness of Kenya's ad hoc Working Committee on the Human Environment, illustrated by the high quality of the country's presentation at the 1972 United Nations Conference on the Human Environment, and the diplomatic prowess of Odero-Jowi, Kenya's ambassador to the United Nations, that saw UNEP's headquarters located in Nairobi, demonstrated the essential commitment of Kenya's neo-Malthusians to environmental matters. The final report of the ad hoc Working Committee on the Human Environment formed the basis of the environmental policy measures that were enunciated in the development plan covering the period 1974/1978. Defining the environment as "...the sum total of all natural and social phenomena that provide both possibilities for, and limitations to man's activities" (Republic of Kenya 1972: 190), the government made a deliberate choice to use the environment on a sustained yield basis, including its enhancement, preservation, restoration, and reclamation, with the recognition that "the conservation of the environment is becoming increasingly important as the growth of population and the impact of development and technology bear on the capacity of the environment to sustain the use being made of it" (Republic of Kenya 1972). Towards this end, the ad hoc Working Committee on the Human Environment was charged with the responsibility of providing advice on the scientific and technical aspects of environmental issues and the needs for conservation. Later, when the National Council for Science and Technology (NCST) was established in 1977 under Cap 250 of the laws of Kenya, the ad hoc committee was converted into a standing committee and reconstituted as the National Environment Secretariat (NES) to serve as a scientific watchdog of the environment.

Whereas the NES was set up for the long term purposes of determining the needs and priorities for research on environmental conservation problems and for the ultimate co-ordination of the various environmental programmes and national environmental policy making, a number of conservation programs were immediately implemented following the Stockholm conference. These included a land use capability survey, the soil and water conservation programmes, anti-water pollution programme, grazing control and restoration programme, marine conservation and restoration programme, and the wildlife conservation programme, among a host of other activities.

During the latter half of the 1980s, concern with the environment in Kenya shifted to controlling human behaviour with a view to achieving a balance between the development needs of the nation and the enhancement and protection of the environment. This was the time when structural adjustment programmes began to be implemented and hence resources were not available on a large enough scale to rehabilitate areas that had already suffered environmental damage. Instead, the thrust of policy measures was focussed on strengthening the institutions necessary for the assessment and monitoring of environmental changes that were likely to have harmful effects in the future. President Moi's government went so far as appointing District Environment Officers throughout the country charged with the responsibility of overseeing environmental issues at the district level. Among the policy measures that were undertaken in the 1980s were: (i) The Environmental Monitoring and Assessment Project whose agenda was to commission studies to fill gaps and update data necessary for planning and decision making within government; (ii) The District Environmental Assessment Project whose objective was to complete environmental profiles of all districts in the country that had not been covered in the earlier surveys; (iii) The Desertification Monitoring Project, which aimed at identifying and mapping areas that were threatened with desert encroachment, and carrying out experiments to identify land use practices necessary to prevent the desertification; (iv) Pollution control and environmental health programmes to review existing standards of water, air, and land pollution and to determine revisions needed to reflect the then state of knowledge; (v) The National Environment Secretariat (NES) also undertook to establish a register of all toxic chemicals used in agriculture and industry that might be harmful to humans and animals. It was further provided that industries were to be registered in accordance with the effluents they emit; (vi) Human Settlement, Shelter, and Service programmes were put in place to provide information on materials and technologies for construction of cheap and safe housing; and to research on cheap ways of solid waste disposal, and recycling of waste to generate energy in the form of bio-gas; (vii) Environmental Education and Information Programs were instituted to inculcate awareness and commitment on part of the general public on the need to preserve the environment and appreciate the interrelationship between the environment and humans in their socio-economic setting. This was done through lectures in schools, seminars for teacher training colleges, and radio and television programmes on soil erosion, water, air, environment and development, energy, and human settlement problems. The NES was also to update the Environment Information Register and expand its library services (Republic of Kenya 1988: 137–138).

In addition to the above measures, the Kenya Rangeland Ecological Monitoring Unit (KREMU) was mandated to undertake the general monitoring of environmental resources; acquisition of environmental baseline data in remaining areas; implementation of projects requested by various government agencies; and dissemination through special studies, seminars, and conferences of methodologies

used for assessment and monitoring of natural resources. By 1989, KREMU had been converted into the Department of Resource Surveys and Remote Sensing (DRSRS) and was in the process of building an inventory of the country's natural resources through the Geographical Information System (GIS) with emphasis on land cover mapping at a time when existing surveys revealed an overall 3.4 percent forest cover in the country while spot satellite scenes indicated an annual average rate of 1 percent depletion. To curb this serious trend towards desertification, government had in 1981 created a Permanent Presidential Commission on Soil Conservation and Afforestation (PPCSCA) and encouraged public, individual, and group initiatives at environmental conservation which resulted in the emergence of such schemes as the Rural Afforestation Extension Scheme, the Green Belt Movement, and various other agro-forestry programmes. These measures continued to ensure sustainable optimal utilization of forest resources both for domestic and industrial use and to check soil erosion and undertake elaborate afforestation programs while at the same time restricting the cutting of indigenous trees. A popular slogan in afforestation efforts at this juncture was: 'if you cut one tree, plant two.'

By the turn of the 1990s, environmental impact assessments were being carried out on specific ongoing and proposed projects with a view to anticipating environmental problems and/or finding their solution before they became too severe. These assessments were designed to address problems caused by human settlements, urbanization, and other developmental problems and projects that may occasion soil erosion, air, water and noise pollution, waste accumulation, congestion, blight and other health-related problems. Furthermore, in order to create a balance between the generation of economic benefits and damage to the environment associated therewith, government undertook to apply the following strategies to eliminate or reduce the negative externalities: (1) Internalization of the impacts of each individual project during appraisal and analysis including all the costs and benefits and in making choices on appropriate technologies, economic value, and project location. (2) Where human health and safety is concerned, government undertook the policy of setting up standards for the sustainable use of resources and for the appropriate disposal of wastes. (3) Subject to absolute upper limits beyond which closure is the solution for avoiding environmental disaster, government undertook to impose deterrent surcharges for those concerns whose activities pollute the environment. Such surcharges were to be used to compensate those individuals and institutions adversely affected by such actions and pay for the cost of rehabilitation. (4) Making a careful balance between the needs of current and future generations in the exploitation of non-renewable natural resources. This required exploiters of natural resources to take appropriate conservation and rehabilitation measures as well as develop new technologies that use less of such resources or otherwise search for alternative resources. (5) Prepare a research report on environmental management and protection as a basis for the promulgation of a National Environment Enhancement and Management

Act (NEEMA) which would include provision for an arbitration tribunal for environmental disputes (Republic of Kenya, 1988: 170).

Up to this moment in time, matters of environmental management were scattered in various sectors in multiple ministries resulting in non-prioritization of environmental governance. However, in 1994, the Kenya government launched the National Environment Action Plan (NEAP) as a framework for upscaling the management of the environment in Kenya. This led to the enactment of the Environmental Management and Coordination ACT (EMCA) in 1999, which became operational in 2002 (see Mireri and Letema 2011: 371–380). The NES was merged with the Presidential Permanent Commission on Soil Conservation and Afforestation and the Department of Resource Surveys and Remote Sensing to constitute the National Environment Management Authority (NEMA) in 2002. Similarly, in 2013, Cap 250 of the laws of Kenya was repealed by the Technology and Innovation Act, which replaced the NCST with the National Commission for Science, Technology, and Innovation (NACOSTI).

Overall, in its concern with the environment, the Kenya government has been intent on evolving policies that promote the rational exploitation and management of environmental resources as a critical part of the national development and improvement of the people's standard of living. This governmental effort has resulted in a fairly comprehensive set of legislative action, including laws and regulations designed to protect the various ecosystems. The laws and regulations cover critical environmental aspects such as environmental impact assessment, pollution, and waste management, with the NEMA having primary responsibility for overseeing implementation of these environmental laws and regulations. Arguably, therefore, the neo-Malthusians have done well to this extent. However, their efforts face the contrarian activities of the unwitting Cornucopians, the impact of whose activities essentially negate the conservation work of the neo-Malthusians.

Neo-Malthusians Confront Cornucopians

As mentioned above, the ad hoc Working Committee on the Human Environment constituted the foremost exemplification of Kenya's neo-Malthusians. Included in this group was Kenya's ambassador to the United Nations at the time, Odero-Jowi, the Kenyan Ambassador to Sweden, Joseph Muliro, as well as a other Kenyan officials including the then foreign affairs minister, Njoroge Mungai, and a host of others within the ministry of environment and natural resources, under the various regimes in Kenya, from Jomo Kenyatta through Daniel arap Moi and Mwai Kibaki to Uhuru Kenyatta. The environmental policies and regulations as well as conservation measures articulated above are the work of this group of individuals within the Kenyan body politic. Indeed, at the height of their moment, neo-Malthusians boasted among their ranks President Moi and environmental activist and 2004 Nobel Peace Prize laureate, Wangari Maathai, who founded the Green Belt Movement in 1977 under the auspices

of the National Council of the Women of Kenya and went on to facilitate the planting of more than 50 million trees across Kenya by grassroots women (see Maathai [2007]).

President Moi remained a champion of environmental protection for the first five years of his presidency. He traversed the country mobilizing the masses to plant trees and construct gabions to stop *mmomonyoko ya udongo* (soil erosion). It was Moi who initiated the appointment of District Environmental Officers to oversee environmental programmes at the district level. The seriousness with which this was taken was illustrated by the fact that at some point in the early 1980s, Kenyans were required to get a permit from their local chief to fell a tree on their own land. Such permits were given only on verification that one had planted two trees in place of the one to be cut. Indeed, Moi went on to establish the second public university in Kenya as a center for environmental studies. The Moi University was established, in Eldoret, in 1984 with only the Department of Forestry and 83 students. By the mid-1980s, however, the attempted military coup of August 1982 and the consequent exigencies of political survival had turned Moi into an unwitting Cornucopian who was now dishing out forest land to cronies and political supporters without a care as to its environmental implications.

By the mid-1980s, President Moi realized that the emerging opposition to his rule was centered among the Kikuyu community, which held much economic power as producers of tea and coffee, Kenya's chief export products. Determined to undercut the economic power of the Kikuyu, he issued an order in 1986 for the establishment of the Nyayo Tea Zones Development Corporation, a state enterprise for tea growing. Nyayo Tea Zones Development Corporation was assigned forest land in order to grow tea ostensibly to provide a buffer between the agricultural land and forests designated for protection as well as an alternative source of public revenue and employment. This was formalized by an Act of Parliament in 1988 following which 2,152 ha of Mau Forest in the Mount Kenya region were cleared. In doing this, not much consideration was given to the suitability of these areas for tea growing. In the end, a mere 542 of the 2,152 ha were planted with tea, resulting in unnecessary but serious loss of forest cover and the concomitant environmental degradation. An example of the extent of corruption and political cronyism as a factor in the depletion of the Mau forest, a major water catchment area in Kenya, was again on display in the run-up to the Kenyan elections of 2002. At this point, the government decided to hive off 2,000 ha from the Mau forest to settle the Ogiek, an indigenous community. Public officials took the opportunity to hive off 10,000 hectares from the forest, which they allocated to themselves and other influential personalities within government (see TI 2011: 181; KIPPRA 2010).

The Green Belt Movement (GBM) under the leadership of Wangari Maathai stands as the most committed to environmental restoration, conservation, and protection, the neo-Malthusian par excellence. The post-mid-1980s Moi government, on the other hand, is the exemplar of Cornucopianism given its cavalier attitude to environmental issues even though it paid lip service to issues

of environmental protection. Three instances amply illustrate the confrontation between these two contrarian forces within the rubric of environmental politics in Kenya. The first instance happened in 1989. The Moi government intended to construct a 60-storey building in Uhuru Park, the only green space in an otherwise crowded city of Nairobi and went on to fence off a section of the park for this purpose. The building, the Kenya Times Media Complex, was to serve as the headquarters of the Kenya African National Union (KANU), the single ruling party at the time, and its newspaper, *Kenya Times*. Maathai mounted a campaign against the construction on account of its negative environmental implications. She mobilized opponents of the construction countrywide who challenged the project and brought local and international pressure to bear upon the government. Maathai was vilified, denounced, and abused by the powers-that-be but eventually, the construction of the complex was shelved when the would-be financiers of the project, including the World Bank, pulled out citing the unfeasibility of the project and its environmental implications (see Amutabi 2007: 218). As a consequence, Maathai's GBM was evicted from its offices in a government building near the Central Police Station, Nairobi, from where it had operated since its founding in 1977 (see Maathai 2007: 197).

The second confrontation happened in 1991. This time around, the government earmarked the Jevanjee Gardens, a public park right in the center of Nairobi's central business district, for conversion into a multi-storey parking lot. Again Maathai mobilized opposition to this move and the public outcry the mobilization generated led to the successful protection of the Gardens from allocation to so-called private developers. Finally, in 1998, the government decided to hive off parts of the 2,000 acres Karura forest for allocation to 'private developers'. The forest is a major water catchment area on the outskirts of Nairobi, not far from the UNEP headquarters in Gigiri. Once again Maathai organized under the aegis of the GBM with the support of John Makanga, a GBM member, and James Orengo, an opposition politician, in opposition to this wanton destruction of the environment. She and her fellow protesters suffered police brutality and were arraigned in court for 'public incitement to violence,' but their sustained protests saved the forest (see Mutua 2009). Indeed, leaders of the newly elected NARC government in 2003 demonstrated their commitment to protecting and preserving Karura forest by proceeding to plant trees there, signaling a kind of truce, at least in the interim, between the political Cornucopians and the civic neo-Malthusians.

Conclusion

That there are actors in Kenya, both public and private, strongly committed to the movement for environmental protection, preservation, and sustainable use of natural resources is beyond question. It is as a result of the activities and commitment of these actors, the neo-Malthusians, that a systematic body of environmental policies and programmes exist in the country. The confrontation

between these environmental protection advocates and the Cornucopians who view the environment simply in instrumentalist terms seems to favour the former. This has been enhanced by the increased opening up of political space that has facilitated greater transparency in public policy making with the resultant ability for the mass public to hold policy makers accountable. Indeed, it is further reinforced by the fact that whereas the neo-Malthusians are consciously aware of the intellectual and scientific basis of their position on environmental matters, the Kenyan Cornucopians are not. The latter are simply driven by their insatiable greed for profit and accumulation, but are bereft of the logic of infinite resources discussed above. In other words, they are merely unwitting Cornucopians.

Nevertheless, though major policies and programmes have been enunciated, there has consistently been lack of adequate budgetary allocation to finance their effective implementation. Additionally, the scourge of corruption, the burden of political patronage, and advertent failure to engage critical stakeholders within communities results in implementation of development projects with serious environmental implications, with little if any oversight. It may be plausible to argue that for the most part, Kenya's policy makers formulate major environmental policy measures and programmes only in response to international environmental conferences. For instance, it is the 1972 United Nations Conference on the Human Environment at Stockholm, Sweden, that resulted in the first ever National Environment Secretariat in Kenya. Similarly, the 1992 United Nations Conference on Environment and Development held at Rio de Janeiro, Brazil, resulted in Kenya's adoption of the National Environment Action Plan in 1994. In the same vein, the passing of the Environment Management and Coordination Act in 1999 and the subsequent establishment of the National Environment Management Agency in 2002 came on the heels of the 2002 Earth Summit in Johannesburg, South Africa. There is an apparent lack of the requisite internal commitment and political will to follow these policies through their implementation. It is against this background that the sustained work of organizations, such as the GBM, assumes great significance for it helps keep environmental issues on the front burner of public policy and practice in Kenya as well as uppermost in the psyche of ordinary Kenyans. The critical issue here is to find an appropriate balance between the dictates of socio-economic development and the imperatives of environmental protection. Perhaps the beginning point in the case of Kenya is to take stock of the impact of environmental policies and practices in the country so far, as a basis of determining the best practices for mitigating the environmental effects of the dynamics of development in the future.

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ARTICLE

India–Africa Relations and Challenges of Sub-Saharan Africa

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Abstract: *Sub-Saharan Africa (SSA) has remained under-developed despite decades of development aid, economic reforms and policy guidance. Modern research is converging on structural deficiency in terms of unequal trade, debt and illicit financial outflows as core culprits of SSA's undersized performance. Meanwhile, the SSA challenge has become more complex with climate change risk. The same has posed a huge financial burden as weak economies struggle with adaptation and mitigation. The paper encourages solutions that tackle systemic inequalities that have propagated SSA's unrelenting development challenge. It therefore examines partnership based South-South Cooperation with specific focus on India-Africa relations as a complimentary solution. Similar economic and development experience is hoped to nurture more meaningful and mutually rewarding partnerships, thus shepherding structural transformation.*

Keywords: *Systemic inequalities, Under-developed, South-South Cooperation, Structural transformation*

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Introduction

It is well documented that structural deficiency still relegates Sub-Saharan Africa (SSA) to the fringes of the world economy. The key systemic issues include unequal trade, debt, and illicit financial outflows. A further complication to this crisis is climate change, which is adversely impacting the region. Possible solutions to SSA's perennial challenges are recommended in several research volumes, and articulated in countless high level platforms, yet, five decades after political independence, SSA still struggles with basic service delivery for its citizenry. The United Nations Economic Commission for Africa, drawing on Millennium Development Goals, shows that Africa still accounts for half of the child deaths globally and the highest maternal mortality. Around 48% of SSA lives in extreme poverty and only 16% of the continent's population has access to piped drinking water (World Bank 2013a). Nearly 76% of households are not connected to the grid and 70% do not have access to improved sanitation (UNICEF 2015). Half of the SSA population is under 25 years of age and an estimated 11 million young Africans are expected to join the labour market every year (Filmer & Fox 2014). SSA is undergoing a demographic transition that is calling for the creation of 18 million jobs per year until 2035 (IMF 2015). This call is urgent considering the discrepancies in sectors such as Angola's oil industry, which is mainly driven by capital-intensive projects, specifically offshore oil extraction. In the case of Angola's oil industry, one finds disparity in the fact that it accounts for 98% of exports, yet it only provides less than 3% of direct employment (Ngongo 2014). Against this backdrop, SSA will grapple with food security, livelihood, health and wellbeing in the face of climate change for the remaining part of this century (IPCC 2014). In light of the above challenges, this article looks at India–Africa relations as a possibility towards structural transformation.

Unequal Trade

SSA suffers unequal global trade. Dating back to colonial times, systemic inequality still endures with overall natural resources export in raw form accounting for 77% of total African exports and 42% of government's revenue (ANRC 2012). It is a "structural" lacuna that many African economies rely on raw materials with limited diversification of their productive structures (AfDB 2013). As a result, manufacturing remains Africa's most underdeveloped area with the continent providing just 1% of global industrial output (RBSC 2012). Africa's dependency on limited commodity exports in part explains why it generally experiences currency exchange rate fluctuations; an example is Zambia where copper, which contributes 70% of total export, only generates one-third of the country's foreign exchange. When the price of copper fell suddenly between January and April in 2014, the kwacha fell by one-third in a comparable timeframe, prompting the country to approach the International Monetary Fund

(IMF) on economic reform, two months after launching a USD 1 billion bond issue at 8.5%. Similarly, Ghana launched a USD 750 million ten-year issue international bond in 2007 spurred by oil revenue. However, delay in anticipated oil revenue, state mismanagement of the energy sector (leading to higher import costs than expected) and a vast increase in public sector salaries saw Ghana approaching IMF for a three-year rescue package, including USD 1 billion to allay a balance of payment crisis in 2014 (Adams 2015). Likewise, Congo Brazzaville's oil revenue which accounts for 70% of national income has not trickled down to the ordinary citizen because of oil-based loans; the government of Congo in 1993, desperate for cash to pay State salaries as oil exports were going to service its earlier oil backed loans, took a fresh 150 million loan from a US-based firm, Occidental Petroleum. This loan was to be repaid with 50 million barrels of oil at a price of $3 per barrel at a time the world market price was $17 per barrel (Adams 2015).

Dependence on primary products where concentration of wealth is in oil and minerals also encourages rent seeking, corruption, and competition. In the process, these resources may foment civil conflict. Meanwhile, commodity price volatility can drive booms and busts in economic activity—either increasing transaction costs because resources have to move between sectors or disrupting investment programmes if projects are abandoned because funds dry up (UNDP 2015). Volatility also reduces long-term growth prospects; for example, unemployed workers lose opportunities for gaining experience and often lack the resources to invest in their education while high levels of uncertainty tend to reduce capital investment. Additionally sustained high levels of oil and minerals prices reduce incentives for the production of manufacturers which often provide opportunities for increasing returns and learning that is not available in the production of primary commodities (UNDP 2015). As a result, commodity exporters have faced challenges in managing earlier commodity price cycles. Many African governments ramped up investment spending, borrowed heavily on anticipation of continuing high prices of commodities, and increased current expenditures in ways that were difficult to reverse, which helped generate the debt crises of the 1980s. Many SSA commodity exporters maintained boom spending as prices declined in the 1980s and failed to reduce consumption during the 1998 price drop, which helped drive ensuing economic crises (UNDP 2015).

Debt

Further crippling Africa is a debt crisis, which is hampering resources going towards development financing (UNECA 1991). SSA's debt service amounted to 3.8% of gross domestic product (GDP) in 2000 whilst expenditure on health was 2.4% of GDP (Boyce & Ndikumana 2002). Due to SSA's slow levels of export earnings it is uphill to honour debt obligations thus countries remain stuck in debt servicing. Arguably Africa's indebtedness should have been part of COP21

discussions (Okereke 2015). Unequal trade has to be solved to address the debt vicious cycle - the ratio of debt to exports renders debt servicing impossible (Easterly 2002).

Worse still, most borrowed funds suffered diversion from domestic investment and consumption to private external assets as political elites channelled the same abroad in the form of capital flight. The period 1970/1996 witnessed 80 cents on every dollar borrowed by SSA countries flowing back as capital flight in the same year (Boyce & Ndikumana 2002). There have been calls for African countries to selectively disavow past loans by petitioning the "odious debt" doctrine in international law and historical precedence, in cases where creditors continued to lend to corrupt regimes despite evidence of accumulation of private assets with their official loans. Rightly, Boyce and Ndikumana (2002) argue that well-functioning credit markets require that creditors bear the consequences of imprudent lending. Diversion of foreign borrowing into capital flight is also a product of systemic flaws in the international financial arrangements that govern borrowing and lending (Boyce & Ndikumana 2011). In a research of 33 SSA countries, USD 700 billion fled the continent during 1970/2008 (Boyce & Ndikumana 2011).

Illicit Financial Outflows

Africa further suffers illicit financial outflows (IFF). According to Mosioma (2015), illicit financial flows originate from three main sources—1) commercial activities, which are; tax evasion, trade misinvoicing and abusive transfer pricing; 2) criminal activities which include drug trade, human trafficking, illegal arms dealing and smuggling of contraband; 3) corruption from government officials. However, of these three sources, the worst offender is the commercial sector particularly multi-nationals operating in Africa's mining, oil and gas sector (Mosioma 2015). Total illicit outflows from Africa might be as high as USD 1.8 trillion with international trade accounting for 60%–65% of all illicit flows. Trade misinvoicing is the largest component of illicit outflow (GFI 2016). Commercial activities account for 65% of IFFs while criminal activities account for 30%, and corruption 5% (Kar *et al.* 2008). Meanwhile, illicit financial outflows end up in banks of developed countries including the United States, United Kingdom, Switzerland, British Virgin Islands, and Singapore (Thabo Mbeki Foundation 2015). About 45% of illicit flows end up in offshore financial centres and 55% in developed countries (GFI 2016).

Another form of illicit outflow is unequal contracts on natural resource extraction "shrouded in secrecy and fuelled by bribes in order to circumvent existing legal provisions for the payment of royalties and taxes" (Thabo Mbeki Foundation 2014). Most multinational companies self-report on quantity and quality of mineral deposits as government agencies are limited in terms of capacity. The USD 1.1 trillion that illicitly flowed out of developing countries in 2013 was roughly 1.3 times the USD 858 billion in total Foreign Direct Investment and 11.1 times the USD 99.3 billion in Official Development Assistance that these

economies received in 2013. A percentage of Sub-Saharan African GDP suffered the biggest loss with illicit outflows from the region averaging 6.1% of GDP annually, against global illicit outflows which averaged 4.0% of GDP (Kar & Spanjer 2013). Taking into cognizance all types of financial flows, both legitimate and illegitimate including investments, remittances, debt forgiveness and natural resources exports, Africa is a net creditor to the world (Kar & Leblanc 2013).

Climate Risk

In addition to unequal trade, debt, and illicit financial outflows, SSA suffers harmful effects of climate change. The first Africa Adaptation Gap Report (2013) committed Africa to adaptation costs of USD 7–15 billion per year by 2020 from past global emissions for which costs could rise to USD 50 billion per year by 2050, if the world does not move from the current path which is heading towards 4°C of warming. In the meantime, Africa's Intended Nationally Determined Contributions (INDCs), submitted to the United Nations Framework Convention on Climate Change, reveal an unprecedented financial burden for the continent towards adaptation and mitigation, which is well beyond domestic fund mobilization. Even more, some countries are unable to shed light on financial implications on adaptation and mitigation because they lack climate change and adaptability country studies as well as proficiency in computing greenhouse gas inventories (Annexure 1).

"No region has done less to contribute to the climate crisis, but no region will pay a higher price for failure to tackle it" (APR 2015). A warming of 2˚C will put over 50% of the African continent's population at risk of undernourishment (AAGTR 2015). On the same African INDCs require 58% and 68% adaptation and mitigation conditional financing respectively (Nkem 2015). Even though climate change is global most damage will be experienced in developing countries (Harrington and Walton, 2008; IWN and CEGI, 2007). Rainfall variability and severe droughts will hinder SSA's efforts to enhance food security and overcome malnourishment (Shmidhuber and Tubello 2007; Muller *et al.*, 2007). Already being suffered are climate sensitive diseases such as Rift Valley fever- afflicting both people and livestock; cholera associated with both floods and droughts and malaria where rising temperatures have spread the disease to the highlands of Kenya, Rwanda and Tanzania (Caminade *et al.* 2011, 2014). This is happening in the backdrop of weak health systems and infrastructure.

Droughts are double trouble in countries that mainly rely on hydropower for electricity. Angola, Cameroon, and Sudan generate 70% of their electricity through hydropower, whilst Mozambique, DRC, and Zambia produce more than 99% of their electricity through hydropower (World Bank 2013b). To compound the crisis the region lacks scientific, technical, technological capacity, funding, and insurance to deal with climate change risk (Schaeffer *et al.* 2014).

On the same the Notre Dame Global Adaptation Index (ND-GAIN) ranks 180 countries both by vulnerability and readiness to adapt to climate change. The Index exposes Africa as the most vulnerable region in the world to climate risk. Of the fifty-two African countries in the ND-GAIN Index rating list only one country- Mauritius is just within the top 50 performers at position 49. Seychelles, South Africa, Tunisia, Morocco, and Botswana are the only 5 African countries ranked within the 100 list. The remaining 46 African countries are in the bottom 80 list, with 16 of them part of the bottom 20 countries. Africa's poor performance is a sharp contrast to the Organization for Economic Co-operation and Development (OECD) countries. New Zealand, Norway, Denmark, United Kingdom, Germany, Finland, Sweden, Switzerland, and Australia top the rating list. The trend continues with United States, Austria, Canada, Iceland, Republic of Korea, France, Netherlands, Japan, Ireland, and Luxembourg extending into the top twenty performers. The remaining OECD members are within the top 37 ranks save for only 2 member countries—Turkey, ranked 47 and Mexico ranked 68. The Group of Twenty (G20) countries which has 43 member countries has 5 member countries within the top 10 performers group, 15 member countries within the top 20 performers group and 30 member countries within the top 37 performers group. Only 9 countries are within the hundred list, save for India ranked at 120 (Annexure 2). In light of the ND-GAIN rating index Africa's vulnerabilities arising from economic, social and environmental circumstance makes it not only the most disaster prone continent in the World but the least prepared to deal with possible catastrophes. Therefore, negative consequences of climate change will deepen Africa's huge developmental challenges given the number of its poor and the fact that many Africans depend on climate sensitive sectors for their livelihoods. With no top performers in the first 10, 20, 37 but only one distant 49 in the top 50 and only 5 within the hundred list, it is a sad paradox that the least emitter is the most vulnerable. There are no OECD or G20 member countries ranked in the bottom 80 countries. There is only one country from OECD member countries and only 8 G20 member countries within the hundred list yet there are 46 African countries in the bottom 80 and 16 of them in the bottom 20 respectively (Annexure 2).

Against this background, where Sub Saharan Africa grapples with trade imbalance, debt, illicit financial outflows and climate change risk, can India-Africa relations usher in structural transformation?

India–Africa Relations

India–Africa relations are part of the momentous South–South Cooperation, increasingly gaining ground over South–North Cooperation. Similar economic and development experience is hoped to nurture more meaningful and mutually rewarding partnerships.

Like Africa, the Indian government is preoccupied with inclusive growth. The two regions share a demographic dividend where the bulk of their population is

in the age group 19–35 years (Arora & Chand 2015). The total unemployment rate in Africa was between 8.1% and 9.8% during 1990 and 2014, whilst for India it was between 3.5% and 4.3% with youth unemployment rate higher than adult unemployment (UNECA & CII 2015). Both regions acknowledge the necessity of micro, small and medium scale enterprises towards industrialization (UNECA & CII 2015). There is also alignment between Africa's Vision 2063 and India's Growth Agenda.

Positively, the expanded Indian presence in Africa has opened up space for Africans to rethink development policy. India offers alternatives to the advice proffered by the IMF and World Bank (Taylor 2016) Asian-style developmental states are a possibility that has occupied the minds of African academics and policy makers. The role of a strong public sector along mercantilist lines is particularly of interest (Price 2011).

Globally, India and Africa are lobbying against unfair global institutions, for example United Nations reforms, including Security Council, as well as negotiations for climate change and the Doha Development Agenda.

Overall, India engages Africa at three levels—through the African Union, Regional Economic Blocs, and bilaterally (Kumar & Nair 2009). In the same spirit, India convenes regular India–Africa Forum Summits (IAFS). Three such summits have happened so far—the first in April 2008 in New Delhi, the second in May 2011 in Addis Ababa, and the third in October 2015 in New Delhi. In the process, India committed significant funding towards capacity building and engaged African Union in a Joint Action plan to determine priority areas in the allocation of resources (Tharoor 2014).

Table 1: India–Africa Forum Summits

No.	Areas of cooperation	IAFS 2008	IAFS 2011	IAFS 2015
1	Economic Cooperation	Agriculture, trade, industry and investment, small and medium enterprises, finance, regional integration	Agriculture, trade industry commerce, small and medium enterprises, finance, regional integration)	Sustainable inclusive growth, value addition and processing facilities, trade, duty free market access, small and medium enterprises, Africa –India project partnership conclaves, cost effective technologies, energy infrastructure, space technology for remote sensing in natural resource mapping
2	Political Cooperation	Peace and security, civil society and good governance	Peace and security, civil society and governance	Peace and Security- support programmes on conflict prevention, management and resolution, combat terrorism in all its forms

No.	Areas of cooperation	IFAS 2008	IFAS 2011	IFAS 2015
3	Science, Technology, Research and Development	Science and technology, information and communication technology	Science and technology, information and communication technology	Cooperation in Education and Skills Development: science, technology, research and innovation, ICT in educational institutions, successful implementation of Pan-African E-Network project, partnership between tertiary institutions.
4	Cooperation in Social Development and Capacity Building	Education, health, water and sanitation, culture and sports, poverty eradication	Cooperation in Social Development and Capacity Building	–
5	Education, health, water and sanitation, culture and sports, poverty eradication	Education, health, water and sanitation, culture and sports, poverty eradication	Health, culture, sports	Cooperation on Health: in HIV, TB, Malaria, Ebola, Polio, improve nutritional application of advancement in science technology, research and development and food security, universal access to primary and public healthcare, reduce maternal mortality, access to affordable and quality medicines and treatment particularly generic medicines, tele-medicine and e-health applications, public-private sector collaboration in the areas of pharmaceutical and procurement in Africa.
6	Tourism	Tourism	Cooperation in Tourism	-
7	Infrastructures, Energy and Environment	Infrastructures, Energy and Environment	Cooperation in Infrastructure, Energy and Environment	Cooperation in Renewable Energy: develop renewable energy-solar, wind, hydropower, geothermal, biomass and building power transmission systems
8	Media and Communication	Media and communication	Cooperation in the Area of Media and Communications	-

No.	Areas of cooperation	IAFS 2008	IAFS 2011	IAFS 2015
9	General areas of Cooperation	-	-	Cultural traditions, gender equality, journalism, e-governance, reform of UN system, parliamentary and electoral processes, air and maritime connectivity, climate change
10	Cooperation in Trade and Industry	-	-	Beneficiation and value addition to resources, capacity building institutions, promote Public-Private Partnership, credit to productive women's groups, WTO training on collective negotiations
11	Cooperation in Agriculture	-	-	Improving agricultural productivity, farming techniques, irrigation, soil quality assessment, improving crop varieties, seeds, efficient use of fertilisers, efficient management of water resources, agricultural equipment, investment in agribusiness, traditional food systems, biodiversity
13	Cooperation in Blue/Ocean Economy	-	-	Sustainable fisheries, maritime connectivity, early warning tools, pollution control.
14	Regional and other forms of Cooperation	-	-	On-going fruitful cooperation between India, the African Union and Regional Economic Communities
15	Monitoring Mechanism	-	-	Formal monitoring mechanism to review the implementation of agreed areas of cooperation. (MEA 2015)

Source: Authors' compilation based on Dubey (2016) and India-Africa Framework For Strategic Cooperation <http://www.mea.gov.in/Uploads/PublicationDocs/25981_framework.pdf>

A closer look at India–Africa relations reflected in the 2008, 2011, and 2015 India–Africa Forum Summits show a deeper commitment in the 2015 Summit, which culminated in the India–Africa Framework for Strategic Cooperation—"Partners in Progress: Towards a Dynamic and Transformative Development Agenda."

Priority areas in this Delhi Declaration have moved beyond generalizations. They are more specific and expounded on, in comparison to 2008 and 2011 (see Table 1). Cooperation in Health is now a stand-alone with specific areas of cooperation articulated. The same goes for all areas within the Delhi Declaration, where even the "general areas of cooperation" are specifically articulated (cultural traditions, gender equality, journalism, e-governance, reform of UN system, parliamentary and electoral processes, air and maritime connectivity, climate change). Further, the 2015 Forum Summit has brought six more additional areas of cooperation which are general areas of cooperation, trade and industry, agriculture, blue/ ocean economy, regional and other forms of cooperation and monitoring mechanism. A "formal monitoring mechanism" on agreed projects is also an indication of a more committed engagement that serves to learn and improve on process by evaluating progress.

It is also encouraging that the Delhi Declaration has taken steps towards structural transformation by proposing to cooperate on manufacturing—"value addition, processing and beneficiation"—of natural resources. Further is the partnership on "space technology for remote sensing in natural resource mapping to ensure Africa evaluates its natural resources instead of the current state where multinational companies self-report."

Historical Background

Historical links between India and Africa date back to the mercantile period when there was extensive trade in the Indian Ocean. However, European colonial expansion resulted in the Indian subcontinent and large parts of Africa coming under British imperial rule and in the process a large community of Indians settled in Africa.

As a result, India–Africa relations were founded on opposition to colonial rule and the apartheid regime in South Africa. Two Indian leaders—Mahatama Gandhi and Jawaharlal Nehru—played a starring role in defining Indo-Africa relationship. Mahatma Gandhi, through his leadership in South Africa (1893/1914) as a lawyer serving the Indian community's struggle for civil rights, inspired heroes of African freedom such as Kwame Nkrumah of Ghana, Jomo Kenyatta of Kenya, Julius Nyerere of Tanzania, and Kenneth Kaunda of Zambia. India's first Prime Minister, Jawaharlal Nehru (1947/1964) opposed all forms of domination, including racial discrimination. He adopted non-alignment both as a policy and collective movement and played a leading role in convening the first Asian-African Conference in April 1955 which brought 29 African and Asian countries to the Indonesian city of Bandung and gave rise to the Non-aligned Movement (NAM). India extended its development experience and provided technical and medical skills, educational scholarships, and other forms of aid under the Indian Technical and Economic Cooperation (ITEC) Programme, launched in 1964 (Dubey 2016).

The 21st century, however, re-drew the framework of cooperation aligned to

the changing world order (Tharoor 2014). In 1991, India opened its economy in the midst of changes within the global system, thus, becoming more active and diversified. As a result, economic interests led to a practical shift in India's policy towards Africa. Agents of India–Africa engagement moved to the private sector which focussed more on issues of business, market access, private sector engagement, energy security, and economic engagement (Dubey 2016).

The Confederation of Indian Industries and the Federation of Indian Chambers of Commerce and Industry organised conclaves, conferences, and programmes in various places in India and Africa to increase India's economic footprint across Africa. In the process, diverse and multi-faceted engagement has emerged in five cardinal areas—i) trade and investment, ii) technology, iii) capacity building, iv) lines of credit, and v) concessional finance.

Notwithstanding these current developments, questions still remain whether SSA's structural challenges will find solutions within the India–Africa partnership? During the India–Africa Summit in October 2015, the Namibian President (Dr Hage G Geingob) bemoaned the fact that "Africa consumes what it does not produce, and produces what it does not consume." Africa's import food bill is USD 35 billion (excluding fish) every year (APP 2015). Africa used to be a global food exporter, but following the decline in many export sectors in the 1990s, the continent has come to rely on food imports to meet domestic demand (Dubey & Biswas 2016).

The structural problem of unequal trade persists within India-Africa trade, with the export of African raw materials such as cashews, cocoa, coffee into India's strong agro-processing industry. The same raw materials are processed and exported back to Africa (Dubey & Biswas 2016). In 2014, Africa accounted for 11% of India's exports and 9% of its imports where mineral products were the major trading commodity. Since 2010 India's exports to and imports from Africa increased by 93% and 28%, respectively. In the meantime, Africa's share from India's total exports has increased from 8.1% to 10.9% (UNECA & CII 2015). Crude oil and natural gas account for two-thirds of all exports, while gold and other precious metals account for about 16% (Brookings-India Oct 2016). India majorly trades with Nigeria, South Africa, Angola, Egypt and Kenya; Angola and Nigeria are primarily regional oil suppliers and Egypt primarily supplies gas. India imports mineral resources, semi-precious metals and gemstones, agricultural raw materials, and timber from South Africa, Kenya, and Tanzania. Meanwhile India exports include refined petroleum products, jewellery, textile products, other manufactured goods, agricultural products, pharmaceuticals and processed foods. In 2014, pharmaceutical products accounted for 2.8 billion USD, or 8% of India's total exports to Africa (Dubey & Biswas 2016). The India–Africa Framework for Strategic Cooperation Document realises this enduring trend and stresses value addition and beneficiation of African natural resources before export, therefore India will assist in the setting up of value addition and processing facilities in Africa (MEA 2015).

In terms of investment, 70% of Indian investment in Africa goes to Mauritius, thus distorting overall figures on Indian FDI in Africa (Eriksen *et al.* 2012).

Partnership with India

Even though aid programmes are driven by vital national interest (Rampa *et al.* 2012) and Indian corporations generally only pursue the bottom line, African governments can use the opportunity of an increased Indian corporate presence in Africa as sources of appropriate technology, skills, and advice on economic development. The African heads of State have an opportunity to negotiate a better business deal with external actors (Taylor 2016). It is up to Africans to negotiate with Indian actors to ensure that the benefits accrued from Indo-African ties are evenly shared and that Indian interest in the continent alongside others may help serve as a catalyst for economic revitalization.

Further the lines of credit extended by the Export-Import bank of India to Africa is an opportunity to enhance market diversification and for Africa's hugely informal economy to learn from Indian small and medium enterprise. IFAS 2015 promised further strengthening of the India- Africa partnership through a new concessional credit of $10 billion for the period 2016/20; and an assistance grant of $600 million. The latter would include $100 million for India–Africa Development Fund, $10 million for India–Africa Health Fund, the financing of 50,000 scholarships in India for the next five years, funds for the expansion of the Pan Africa E-network, and of institutions of skilling and training across Africa (Bhatia 2015).

Capacity building programmes under the Indian Technical and Economic Cooperation Programme (ITEC) and Special Commonwealth Assistance for Africa Programme (SCAAP) do have potential for aiding some Africans if graduates are subsequently supported and nurtured on their return to their countries. However, there is need for research to ascertain how such projects and processes are impacting different sections of the society, therefore the need for monitoring and impact assessment (Dubey & Biswas 2016). Otherwise the Indian experience of agricultural development, human resource management and its success in the implementation of public-private partnerships in infrastructure projects is relevant when taking African development challenges into consideration.

Conclusion

Sub-Saharan Africa is yet to deliver on basic necessities to its people - modern energy, water, health facilities, housing, transport, education, employment and social security among others. Lack of resources and capacity stemming from enduring systemic issues forecast a protracted status quo. Fundamental towards transformation is the urgent need to address unequal trade, debt, illicit financial outflows and climate change risk.

The region suffers trade imbalance resulting in deficit balance, which in turn locks SSA in perennial debt servicing. A lasting solution will be an investment in value addition and beneficiation of natural resources before export as well as establishment of manufacturing industries and encouraging inter-Africa trade. Meanwhile stop-gap measures require governments to save sufficiently during commodity booms to support consumption and investment once commodity prices decrease. Further, there is need to restructure mining company's contracts during commodity price booms, through profit-sharing agreements or linking taxes with price changes. Moreover, the risks inherent in volatile commodity markets can be shared with extractive industry firms or hedged in forward or futures markets (UNDP 2015).

Africa's debt can be addressed by improving on the debt ratio versus exports, prudent lending and financial management. Regarding the curbing of illicit financial outflows, Africa requires concerted effort in fiscal discipline as well as consistent international support and intervention.

In the recent times, climate change further complicates the SSA challenge. Achieving the Sustainable Development Goals, let alone the earlier Millennium Development Goals, becomes a mammoth task since resources, meant for development, are channelled towards adaptation. The situation calls for innovative solutions on how to eradicate poverty, create jobs, and sustain growth in SSA on a low carbon trajectory. Robust institutions and strong government leadership would significantly ensure this inclusive growth path.

In the light of SSA challenges, what can India–Africa Cooperation bring? Although national interest takes precedence, the historical context of shared experience and comradeship make it easier to forge mutual benefit for the two regions. Like Africa, India faces challenges of poverty, unemployment, and climate change risk; nevertheless, it has scored huge successes in low cost innovations, versatile institutions, political will, and vibrant democratic space. India's inclusive growth efforts, rural health care, water conservation, scientific expertise, educational and research institutions, and programmes for women could inspire SSA. The India–Africa Forum Summits, credit lines, and fully funded capacity building programmes are also a great opportunity of sharing experiences and forging alliances towards structural transformation.

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Annexure 1: INDCs—Cost of Adaptation and Mitigation in Africa

No.	Country	Adaptation Costs (USD)	Mitigation Costs (USD)
1	Algeria	require diversified international support, including financing, capacity-building and technology transfer	Need new and external financial resources, and technology transfer, and capacity building
2	Angola	1000 million	14.700 million
3	Benin	–	–
4	Botswana	–	18 400million
5	Burkina Faso	–	–
6	Burundi	3,719 million	1450,618 million
7	Cameroon	18 00 million	39 388 million
8	Cabo Verde	require specific international support in terms of capacity-building, technology transfer, and financial commitments	800 million
9	Central Africa Republic	110 million	226 million
10	Chad	14200 million	7100 million
11	Comoros	300 million	375 million
12	Cote d'Ivoire	–	20 140 million
13	Democratic Republic of Congo	9000 million	13 000 million
14	Djibouti	8340 million	5500 million
15	Egypt	–	–
16	Equatorial Guinea	3673,3 million	114,5 million
17	Eritrea	6362 million	1479 million
18	Ethiopia	–	150 000 million
19	Gabon	–	–
20	Ghana	12 790 million	9810 million
21	Gambia	–	–
22	Guinea	3673,3 million	114,5 million
23	Guinea Bissau	42 million	700million
24	Kenya	–	–
25	Lesotho	–	1200 million.
26	Libya	No record of Submission	
27	Liberia	–	–

No.	Country	Adaptation Costs (USD)	Mitigation Costs (USD)
28	Madagascar	28 713 million	6370 million
29	Malawi	–	–
30	Mali	1062 million	
31	Mauritania	9400 million	9300 million
32	Mauritius	4000 million	1500 million
33	Morocco	–	45000 million
34	Mozambique	–	–
35	Namibia	–	–
36	Niger	1607 million	$7.060 million,
37	Nigeria	International finance and investment, technology and capacity building will be needed to achieve the ambitious intended contribution. Further work is needed to determine the exact domestic share of the full contribution, as well as the total investment required	
38	Republic of Congo	9000 million	13000 million
39	Rwanda	–	–
40	Sao Tome & Principe	require external financial support in addition to technological support and capacity building	
41	Senegal	14 558 million	6800 million
42	Seychelles	295 million	309 million
43	Sierra Leone	–	–
44	Somalia	Not indicated	–
45	South Africa	2900 million	1380500 million
46	South Sudan		-
47	Sudan	1200 million	11.68 million
48	Swaziland	The full implementation of Swaziland's INDC is contingent upon continuous strengthening of the country's technical capacities, technology transfer and development as well as financial support received.	
49	Tanzania	1200 million	60 000 million
50	Togo	–	1100 million
51	Tunisia	2000 million	18 000 million
52	Uganda	2900 million	5436 million
53	Zambia	20 000 million	35000 million
54	Zimbabwe	36 700 million	7000 million

Source: Author compilation based on submissions made by member states; <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx>

ARTICLE

Co-existence of Genetically Modified and Non-GM Crops: Implications for Africa

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Abstract: *The increasing global adoption of GM crops is engendering debate on the feasibility of successful co-existence of GM and non-GM crops in Africa. Although Europe and North America have debated and developed co-existence regulations and strategies respectively, African countries are yet to do the same. Co-existence regulations are not specific to the production of GM crops; they have been utilized for many years to protect specific harvests, ranging from colour of maize products and drift of pesticides or fertilizers to organic fields. Product segregation has also been in existence for centuries with producers cooperating to ensure crop integrity for specialized products. This article discusses regulatory approaches to co-existence, current arrangements in achieving product segregation, links between co-existence measures and identity preservation, cross-border trade and the role of regional economic communities in Africa. The article distils policy options that will provide safeguards for successful co-existence and proposes measures for managing the growing demand for different foods in the global market place. Some conclusions are that lessons can be learned from traditional practices to help ensure practical and affordable co-existence measures for new agricultural products. GM crops have been documented as having contributed to sustainable development in several significant ways, including contributing to the alleviation of poverty and hunger, reducing agriculture's environmental footprint, mitigating climate change, and reducing greenhouse gases. Co-existence is a complex process where a 'one-size-fits-all model' will not be effective in all growing regions. Current efforts to harmonize biosafety regulations should explore regionally appropriate co-existence strategies that would enable GM crops, which are in consonance with green growth, to be part of agricultural production systems.*

Keywords: *Co-existence, Genetically modified, Segregation, Trade, Environment*

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Principles and Rationale for Co-existence

Co-existence in agricultural biotechnology refers to genetically modified (GM), conventional and organic production systems that operate in proximity without mixing of produce or compromising their economic value (Zepeda 2006; Brookes 2004). Brookes (2004) further notes that the key principles of co-existence are: context (relative agronomic and commercial importance of the different crop production systems); consistency (adherence to established standards); proportionality (science-based and non-discriminatory guidance); equity (fairness), and practicality (based on scientific, legal, and workable realities). An essential underlying philosophy is mutual recognition for the different agricultural production systems. The co-existence of these different production systems facilitates access to niche markets, ensures good returns on investment, provides safeguards to sociocultural norms and values, and permits diversification in production as a coping mechanism under variable environmental conditions. Stakeholders, such as governments, consumers, producers, traders, and industry (including seed developers) have requested a system that is demand-driven and offers freedom of choice while protecting the interests of indigenous communities. The goal is to cater to different niche markets that support the economic interests of the various production systems.

Traditional Mechanisms for Achieving Product Segregation

Product segregation has been in existence for centuries with producers cooperating to ensure crop integrity for specialized products. For instance, in North America and Europe, the technical and management measures adopted to ensure segregation include delayed or staggered planting times, use of varieties with different flowering times, crop rotations, isolation distances, designated zones for planting specialist crops, use of buffer rows around specialist crops (pollen barriers), record-keeping, training, and delivery to designated storage facilities or processors. These measures have been effective in ensuring crop integrity. In Portugal, farmers growing GM maize undergo mandatory training and are obligated to inform farmers in neighbouring fields and operators with whom they share agricultural equipment. Based on the Food and Agriculture Organization's (FAO) crop classification, they also comply with established isolation distances, or use buffer rows and different flowering times.

In some African communities, informal arrangements or understanding exists among producers to achieve some level of segregation. For instance, farmers growing GM and organic cotton maintain a distance of 100 m from each other and are permitted to grow only one crop and not the other. These common arrangements include designated zones for planting specific crops, designated silos that accept conventional or GM or organic harvests; implemented isolation distances, staggered planting times, or using varieties with different flowering

times (Chandler and Dunwell 2008; Hancock 2012). Groups of farmers in South Africa have segregated non-GM soybeans and non-GM maize for processors. This is not always financially lucrative, but indicates that co-existence is possible in Africa.

The adventitious presence[5] of GM material in non-GM products can occur at various stages of the value chain. At the production stage, there is the possibility of modified genes finding their way into non-GM crops through pollination or seed mixing. Cross-pollination through pollen drift by wind, water or animals to nearby non-GM crops is influenced by the crop biology and geographical location. Importantly, outcrossing can only occur to sexually compatible plants (Fehr 1987; Hancock 2012). All other plants are unaffected by pollen from GM crops. Seeds left in a field after harvest can result in volunteer plants during the next season that pollinate the new crop. Measures to control volunteers are already implemented for conventional and organic farming and can be used for GM crops. Vegetatively propagated crops, such as potatoes, sweet potatoes, banana, and cassava, are not affected by pollen flow, as seeds are not used in the next season for planting.

Adventitious presence can happen when farm machinery is not thoroughly cleaned during use on different crops, when different planting material is not kept separate in storage facilities and during post-harvest handling of produce if care is not taken during transportation and delivery to prevent unwanted mixing. Thus, technical and management measures are required during planting, cultivation, harvest, storage, transport, and handling of harvested material. The key issue in successful co-existence is providing safeguards and ensuring compliance at each production stage. The safeguards are crop specific and may range from 1 m to over 1000 m. For example, effective isolation distances for maize is 200 m, rice is 100 m, and sorghum 200–400 m, respectively (OECD 2013).

Implementing Co-existence

Countries currently have different regulatory approaches to co-existence. Some have co-existence policy measures without legislation, others have legislation and guidelines in various laws, and some have no provisions at all. Absence of legislation is not an insurmountable barrier. Industry bodies, such as agricultural boards, in some instances implement and monitor measures for coexistence and segregation of crop harvests. Spanish farmers, in the absence of legislation, used 'Good Agricultural Practices' for guidance on farm and post-production processes and these guidelines are attached to seed bags at the point of sale. The EU has regulated co-existence between GM and non-GM crops. The regulations: (i) advocate for management measures that reflect best available scientific evidence on the probability and sources of mixing between GM and non-GM crops; (ii) permit cultivation of GM and non-GM crops while ensuring that non-GM

[5] Unintended or technically unavoidable presence of GM material in a non-GM crop.

crops remain below the legal thresholds for labelling and purity standards with respect to GM food, feed and seeds, as defined by Commission Recommendation 2003/556/EC. Threshold levels are set by countries that regulate the labelling of GM content in foods and by the organic industry. They are set at percentages of total content and if GM content is higher than the designated threshold, the food label must note that GM ingredients are present.

In the United States, the Advisory Committee on Biotechnology and 21st century Agriculture (AC21, 2012) has made recommendations to the U.S. Department of Agriculture (USDA) regarding agricultural coexistence. The USDA is currently receiving public comment on these recommendations and will move ahead once the comment period is complete. Importantly, the recommendations note that all participants in the development, breeding, marketing, and management of crop production need to be involved in making coexistence work. The USDA will determine whether coexistence can continue to be managed using recommendations only, or whether legislative instruments will be required.

The co-existence of GM and non-GM crops in agriculture is an issue of economics and market value, but the debate has sometimes been triggered by environmental and food/feed safety concerns. These safety concerns are unwarranted because regulatory authorities complete science-based safety assessments before approval is given for the commercial cultivation of GM crops. Biosafety regulation helps to ensure both an adequate level of safety and access to safe new products that will benefit local communities. Potential pitfalls that regulatory authorities must avoid if coexistent management is included in the permit conditions for commercial cultivation include excessive and unworkable compliance requirements, a lack of appreciation of the agricultural landscape (farm size and location), and a poor understanding of existing indigenous co-existence strategies within the agricultural supply chain. Although it has been established that outcrossing[6] decreases with increasing farm sizes, many farmers in Africa have small land holdings and having a variety of crops growing in close proximity can complicate implementation of successful co-existence. If these crops cross-pollinate easily with GM crop, then it is necessary to manage their coexistence. Successful co-existence measures must factor in existing practices for co-existence of conventional and organic agriculture, potential sources of adventitious mixing, whether these impact the harvested crop, the legal threshold limits, the types of co-existence measures essential to attain such thresholds, and practical and affordable measures to ensure co-existence.

Almost all traded agricultural commodities accept some degree of adventitious presence in supplies and hence have thresholds set for the presence of unwanted material (Brookes 2004). Current thresholds of acceptable levels of adventitious presence of GM material in non-GM commodities vary. For instance, while the US has no threshold, the EU and Australia have a threshold of 0.9 per cent before GM labelling, Brazil and New Zealand have thresholds of one per cent, and Japan

[6] The movement of pollen to surrounding crops.

has five per cent. Some African countries, such as Burkina Faso and Ghana, have regulations that allow a one per cent threshold for adventitious presence of GM in non-GM food or feed products, which is in compliance with market demands.

Link between Co-existence and Identity Preservation

Co-existence measures are frequently linked to identity preservation, which provides a paper trail that confirms that segregation has been maintained. Identity preservation provides an important measure of traceability within the food and feed value chain and is feasible to implement. South Africa, for example, confirms segregation using identity preservation. The produce, when harvested, is segregated and tagged, using a unique identifier.

Cross-border Trade and the Role of Regional Economic Communities in Africa

Implementing co-existence measures must be guided by international agreements established by the World Trade Organization (WTO), Codex Alimentarius and the Cartagena Protocol on Biosafety (CPB) to the Convention of Biological Diversity. However, competing international rules for trade in GM are observed as whereas the CPB restricts trade based on the precautionary principle relating to scientific uncertainty, the WTO does not allow trade restriction based on the same (Kerr et al. 2014; Qaim 2016). Concerns have been raised as to whether markets exist for GM crops and whether cultivation of GM crops will undermine international trade. Evidence suggests markets exist for both GM and non-GM crops and that there is growing demand for GM crops. In 2015, more than 18 million farmers in 28 countries planted 179.7 million hectares of biotech crops with a reported global market value of US$15.3 billion and farmer benefits for the period 1996-2015 being US$150 billion (James 2015).

The impact of cross-border trade is an important consideration in Africa where some countries have not yet approved the use of specific GM crop events. Regional economic communities in Africa need to strive for co-ordinated coexistence, adventitious presence and identity preservation standards to facilitate regional trade. Stewardship measures are being implemented on the continent to help minimise the impact of GM crops on local food and feed markets and on regional and international trade[7]. To achieve effective segregation of specialised produce, distribution systems that originally handled undifferentiated commodities may need to be remodelled. For example, it may be important to adopt compartmentalized freighting systems rather than continue using the current system of sheets to maintain horizontal separation during shipping. When designing new models, consideration needs to include who will be responsible for implementing the measures and who will pay the costs of co-existence and segregation. The EU guidelines specify

[7] SABIMA is an agricultural biotechnology stewardship program being implemented in Africa by FARA.

that producers who introduce a new production method into a region should bear responsibility for farm management measures to limit outcrossing. It is understood that these costs will be passed on to the consumer.

Co-existence of GM and Non-GM Crops in Relation to Green Growth in African Economies

For close to two decades, NEPAD has been at the forefront of the implementation of appropriate development policies and decisions by the continent's political leadership. Technical cooperation and assistance from NEPAD has supported efforts by AU member states to address issues of structural underdevelopment and dependency and the drive to build key sectors of the economy through human capacity development, investment in Science, Technology and Innovation, infrastructure development, strengthening of institutions and diversification of economies. One of the options considered in diversifying African economies has been to embrace green growth that would result in transitioning to green economies, a new frontier for global economic growth and stability and an important policy discourse in development economics. A "green economy" can be defined as one that aims at improving human wellbeing and social equity in a sustainable manner, while significantly reducing environmental risks and ecological scarcities (UNEP 2010, 2013). A terminology closely associated with green economy is "green growth". Both terminologies relate to significantly lowering greenhouse gas emissions, reducing poverty and improving livelihoods.

Most African Union (AU) member states are Parties to the Cartagena Protocol on Biosafety (CPB), a legally binding international agreement negotiated, concluded and adopted within the framework of the Convention on Biological Diversity (CBD). The CPB was established to guide Parties in developing systems for the environmentally sound management of modern biotechnology applications. The goals of the CBD are to conserve biological diversity, ensure sustainable use and attain access and benefit-sharing. It is instructive to note that the objectives of the CBD align with those of a green economy and green growth vis-à-vis resource conservation and management and with particular reference to the conservation and sustainable use of biological diversity (UNEP 2013; CBD 2008).

The common theme for the CBD, green growth and green economy is how these contribute to current global concerns regarding food security, sustainability and climate change. James (2015) states that available statistics for the period 1996 to 2014 showed GM crops contributed to food security, sustainability and climate change by:

- increasing crop production valued at US$150 billion;
- providing a better environment, by saving 583.5 million kg a.i. of pesticides in 1996-2014;
- in 2014 alone reducing CO_2 emissions by 27 billion kg, equivalent to taking 12 million cars off the road for one year;

- conserving biodiversity in the period 1996-2014 by saving 152 million hectares of land (Brookes and Barfoot 2016 cited in James 2015); and
- helped alleviate poverty by helping up to 16.5 million small farmers, and their families totaling >65 million people, who are some of the poorest people in the world.

James (2015) further notes that feeding 9.7 billion people in 2050, and approximately 11.0 billion in 2100 will be a daunting challenge that requires a balanced, safe, and sustainable approach to agriculture as proposed by the global scientific community and would entail using the best of available technologies, including modern biotechnology, to achieve sustainable intensification of crop productivity on the 1.5 billion ha of cropland globally. Therefore the adoption of GM technology ties in with the concept of green growth which proffers that economic growth can occur concurrently with the attainment of significant reduction of negative environmental impacts arising from economic activities.

Policy Options for Co-existence in Africa

Co-existence systems for GM, conventional, and organic crops afford farmers a choice of production systems that will help meet demands for markets by maintaining crop integrity within an agro-ecological system and preserving the economic value of the harvest. The focus should be on adopting available, safe, and useful technologies rather than a policy of exclusion that serves the narrow interests of some to the detriment of others. Thus, efforts that would ensure coexistence of various agricultural production systems and which in effect would allow GM technology to contribute to both climate change and economic growth, and by extension green growth, are worth exploring.

Co-existence requires clear guidance that must be adapted to growing regions in Africa. The feasibility of co-existence measures must be evaluated on a case-by-case basis and supported by policies and guidelines that are science-based, efficient, cost-effective, and specific to particular crop and farming systems. The drive to develop co-existence measures will most likely come from the food and feed industry, but it will benefit from supportive government coordination. Considering current efforts at regional levels to harmonize biosafety regulations, it would be useful to explore regionally appropriate co-existence strategies at the same time.

It is important for stakeholders to be willing to collaborate on the development of co-existence strategies. This will require a willingness to reach compromises, mutual respect, shared responsibilities, and government leadership in creating an enabling environment for these discussions. The planning of co-existence measures will need updated information on the biology, production, and trade of crops in Africa to identify appropriate strategies. Planning should include information on the experiences and best practices that have worked in other parts of the world. While on going stewardship training, farmer cooperation, education,

and the application of indigenous agricultural knowledge are critical for success, establishing clear guidelines for co-existence is an essential starting point. Countries growing GM crops will gain local co-existence management experience that can benefit neighbouring countries and trading partners.

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ARTICLE

Climate Change and Dietary Implications: Insights from Sub-Saharan Africa

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Abstract: *Climate change is a threat to the food and nutrition security of countries in sub-Saharan Africa. The impacts of climate change are exacerbated by tenuous structures that stem from conflicts, weak institutions, and complex disasters. Urgent mitigation strategies are required to curb this burden. Food production contributes significantly to the emission of gas that leads to global warming; for example, 80 per cent of the harmful greenhouse gases (GHGs) come from livestock production. Dietary patterns drive the food production and thus, there is a need for dietary guidelines to help mitigate the impacts of climate change. Shifting the dietary guidelines to put emphasis on plant-based foods has been projected to reduce GHG emissions, improve health, and result in economic gain in the future. This article focusses on the transformation of dietary patterns as a promising and viable strategy for mitigating the impacts of climate change in sub-Saharan Africa.*

Keywords: *Climate Change, Dietary Patterns, Sustainable Development, sub-Saharan Africa*

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Introduction

Climate change is currently posing a threat to food and nutrition security at a global level. Africa is projected to continue experiencing a stronger warming trend than other regions in the world (Boko et al. 2007). This is anticipated to lead to decreased precipitation, increased evapotranspiration, and increased desertification (Boko et al. 2007). Countries such as South Africa, Zimbabwe, Botswana, Tanzania, Mozambique, Malawi, Namibia, Angola, Lesotho, Zambia, and Swaziland have already started to experience unpredictable and volatile rainfall patterns which are adversely shortening cropping seasons (Mubaya, Njuki, Mutsvangwa, Mugabe, & Nanja 2012). However, African countries have less resilient strategies to mitigate these effects (Niang et al. 2014). Poverty, weak institutions, complex disasters, and associated conflicts have been noted as the underpinnings of the inability of African countries to respond to measures to curb the impacts of the urgent crisis of climate change (Boko et al. 2007). The impacts of climate change will further worsen the under nutrition problem in Africa (Tirado, Hunnes, Cohen, & Lartey 2015). Urgent strategies are thus required to curb this burden.

Eating patterns drive agricultural food production which in turn leads to emission of greenhouse gases (GHGs) and climate change. Thus, the food-based dietary guidelines (FBDGs), which are designed to educate people to develop eating patterns for normal health and well-being, should also ensure environmental sustainability. Much emphasis has been indicated on the negative effects of climate change on food production while ignoring the contribution of the same food production to climate change in sub-Saharan Africa. However, if the significant contribution of food production to climate change is not sustainably corrected, the declining food production will continue to be worsened by climate change. There is an urgent need to develop dietary guidelines which encourage people to adopt sustainable dietary practices, especially in the context of climate change. Similar calls have been made to pattern the dietary guidelines for environmental sustainability since the 1980s, but they are yet to be acted upon in sub-Saharan Africa (Gussow & Clancy 1986).

This article makes the case for the need to develop sustainable dietary guidelines in sub-Saharan Africa through the following themes:

- The impact of food production on climate change and lessons from Tanzania
- Food-based dietary guidelines and lessons from South Africa
- Towards environment-friendly eating patterns

The Impact of Food Production on Climate Change and Lessons from Tanzania

A holistic paradigm approach for mitigating the effects of climate change on food

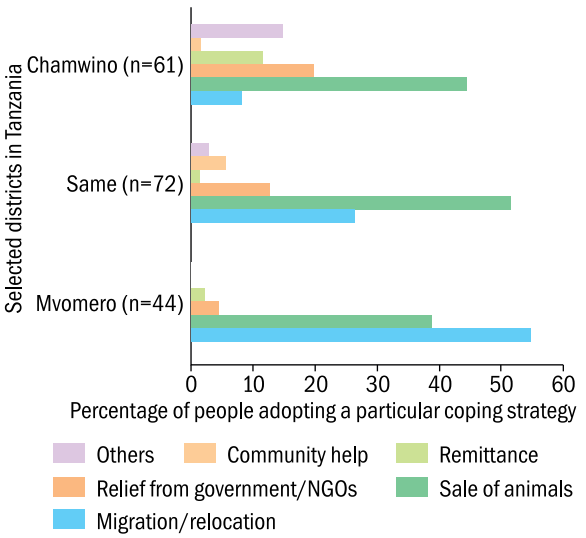
and nutrition security is required to ensure sustainability. Such an approach should not only focus on the effect of climate change on food production but also on the effect of food production on climate change. The current eating and food production patterns are also contributing to climate change. Thus, there is a need for sustainable food production measures to avoid depletion of natural resources and reduce global warming which leads to climate change.

Food production is driven by consumer demand. The eating patterns of Africans are now shifting towards the Western dietary patterns that consist of more meat and processed foods (Vorster *et al.* 2011). These dietary changes in turn put pressure on the agricultural sections to boost livestock production. However, increased livestock production has adverse bearing on climate. Eighty per cent of the carbon dioxide (CO_2) equivalent of the GHG emissions comes from livestock production (Steinfeld *et al.* 2006). Other GHG emissions which have higher global warming potential compared to CO_2 are emitted during livestock production (Mushi et al., 2015). These gases include methane (CH_4) and nitrous oxide (N_2O) which have 23 times and 296 times more global warming potential (GWP), respectively, than CO_2 (Mushi *et al.* 2015). Therefore, livestock production needs mitigation measures to ensure it does not exhaust natural resources and contributes to climate change. However, such measures of transforming the livestock production to alleviate climate change should also include interventions to change the eating patterns which are the major drivers of the increased demand for animal products from agricultural production.

About 22.8 million cattle, 15.6 million goats, 7.0 million sheep, 2 million pigs, and 60 million poultry are estimated to constitute the livestock of Tanzania (Mushi *et al.* 2015). The livestock in a large way contributes to nutrition security and gross domestic product of the country. However, the production of these animals contributes to climate change through the emission of GHG which leads to global warming. These GHGs, including N_2O, CH_4, are emitted from manure and enteric fermentation, respectively.

The estimates of GHG emissions from Africa are usually extrapolated from developed countries and might therefore be less applicable due to differences in climates (Herrero *et al.* 2011). According to reports of GHG emission in Tanzania, it is estimated that a total of 55,208 Gg of the GHG gases were emitted form livestock production. The CO_2, CH_4, and N_2O emissions from Tanzania to the global warming potential were 55 per cent, 45 per cent, and 1 per cent, respectively (Mushi *et al.* 2015). Depletion of water resources and loss of biodiversity has been documented in Tanzania as a result of climate change. Climate change has also been noted to have negatively affected livestock production as drought led to significant losses of livestock and livelihood (Mushi *et al.* 2015). The most common climate change coping strategy for the livestock farmers is selling cattle as illustrated in Figure 1.

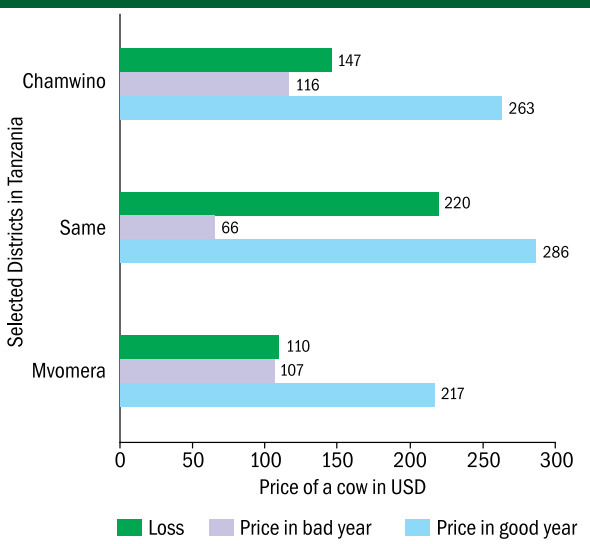
Figure 1: Climate change coping strategies for selected livestock farmers in Tanzania



Source: Adapted from Tumbo et al. (2011)

However, these result in further significant losses as they cannot use that money to buy cows in a good season, since they sell at a loss during the bad season as indicated in Figure 2.

Figure 2: Selling prices of cattle during and after periods of adverse climate change



Source: Adapted from Tumbo et al. (2011)

The increase in toxic plants to livestock has increased in Tanzania and this coupled with drought spells has led to further losses in livestock (Shemsanga *et al.* 2010) Thus, we learn from the example of Tanzania that increased livestock production will in the long run lead to climate change which might ultimately diminish the returns from agriculture, including livestock production. There is need to change the eating patterns that have increased the demand of livestock in an attempt to reduce climate change and ensure sustainable agriculture and livestock production for the future generation.

Food-based Dietary Guidelines and Lessons from South Africa

FBDGs are simple, short, and positive messages used to encourage people to choose healthy eating patterns for health and nutritional well-being (Vorster *et al.* 2013). Significantly, the FBDGs focus on foods and not nutrients. However, the FBDGs are supported by scientific evidence and are designed to be realistic and relevant to the context of the indigenous foods available (Vorster *et al.,* 2013). The FBDGs have a potential of enabling the promotion of health and sustainable eating patterns which can attenuate climate change. The calls to transform the FBDGs and ensure environmental sustainability have not yet been implemented in sub-Saharan Africa; yet, this is where the said calls are urgently required, considering the adverse effects of climate change on the agro-based economies (Gussow & Clancy 1986).

A majority of countries in sub-Saharan Africa do not have documented FBDGs. As of 2014, only three countries, including South Africa, in sub-Saharan Africa had FBDGs (FAO 2017). However, sub-Saharan Africa is experiencing a triple burden of malnutrition which is characterised by undernourishment, micronutrient deficiencies, and obesity which necessitates an urgent development of FBDGs to promote healthy eating patterns (Belahsen 2014; Labadarios & Steyn 2005). Stunting, an indicator of chronic undernourishment, is significantly higher in sub-Saharan Africa among children younger than five years compared to other parts of the world and it ranges from 20 per cent to greater than 40 per cent (Labadarios & Steyn 2005). Stunting has been reported to be over 40 per cent in seven countries in sub-Saharan Africa—Zambia, Namibia, Congo, Malawi, Madagascar, Niger, and Burundi (Steyn & Mchiza 2014). Micronutrient deficiencies are mostly prevalent among pregnant women (Labadarios & Steyn 2005). Obesity is a risk factor for non-communicable diseases (NCDs) and countries such as Burundi and Madagascar have been reported to have prevalence rates of overweight and obesity of 40 per cent (Steyn & Mchiza 2014). The existence of these nutrition challenges in countries which do not have documented FBDGs indicate that most countries still need to recognise the value of these FBDGs to address malnutrition and the greater role they can play in mitigation of the effects of climate change.

As already stated, South Africa is one of the few sub-Saharan countries with documented processes of developing FBDGs (Vorster *et al.,* 2013). The first

FBDGs of South Africa, as indicated in Box 1, were developed in 2003. However, as of 2011, a working group was organised to revise the FBDGS in line with the nutritional challenges of the triple burden of malnutrition (Vorster *et al.,* 2013).

Box 1: South African food-based dietary guidelines 2003

- Enjoy a variety of foods
- Be active
- Make starchy foods the basis of most meals
- Eat dry beans, peas, lentils, and soy regularly
- Chicken, fish, meat or eggs can be eaten daily
- Drink lots of clean, safe water
- Eat plenty of vegetables and fruit every day
- Eat fats sparingly
- Use salt sparingly
- If you drink alcohol, drink sensibly
- Use foods and drinks containing sugar sparingly and not between meals

The FBDGs were revised (Box 2) in 2013 to address micronutrient deficiencies, obesity, and diet-related diseases. There is still more work to be done regarding the transformation of dietary guidelines and eating patterns. Nevertheless, South Africa seems to understand that FBDGs can contribute towards the alleviation of malnutrition.

During the review of the FBDGs, consumption of alcohol was removed in view of its abuse in South Africa (Jacobs & Steyn 2013). The consumption of milk products was incorporated into the FBDGs to improve the low calcium levels that had been noted among the South Africans (Vorster *et al.,* 2013). The established link of salt and hypertension led to the removal of the dietary guideline for using salt sparingly as indicated in Box 2 (Wentzel-Viljoen *et al.,* 2013). In an attempt to prevent consumption of fats which are risk factors to cardiovascular diseases, the FBDG for fats was revised in favour of quality of fats such as vegetable oils which contribute to good health, instead of hard fats from animals (Smuts & Wolmarans 2013). However, during the review of the FBDGs, the transformation of eating patterns to ensure low demand of agricultural produce which releases GHGs was not considered.

Box 2: South African food-based dietary guidelines 2013

- Enjoy a variety of foods
- Be active
- Make starchy foods part of most meals
- Eat plenty of vegetables and fruit every day
- Eat dry beans, split peas, lentils and soya regularly
- Have milk, masa or yoghurt every day
- Fish, chicken, lean meat or eggs can be eaten daily
- Drink lots of clean, safe water
- Use fats sparingly. Choose vegetable oils, rather than hard fats
- Use sugar and foods and drinks high in sugar sparingly

Although the current FBDGs of South Africa promise to help curtail the triple burden of malnutrition, the evidence to support these guidelines did not consider the environmental impacts. As has been documented in the case of Tanzania and globally, increased livestock production has a negative bearing on the environment as it exacerbates climate change. Of particular concern is the FBDG, "Fish, chicken, lean meat and eggs can be eaten daily" (Schonfeldt & Hall 2013). These FBDGs in essence promote extensive livestock production in order to meet the daily intake of livestock produce. Although the promotion of meat-based products is meant to boost protein intake and micronutrients, such as iron and Vitamin B12, there are other environment-friendly foods, such as beans and fortified cereals, which can be promoted that also provide adequate micronutrients and proteins. There is still an urgent need for South Africa and other sub-Saharan African countries to transform their FBDGs towards mitigation of climate change.

Towards Environment-friendly Eating Patterns

It has been noted that vegetarian and Mediterranean dietary patterns are suitable for promoting adequate nutrition, preventing against non-communicable diseases, and being environment-friendly (Springmann *et al.,* 2016). A number of studies have evaluated the association of a variety of vegetarian diets with environment outcomes. Low red and processed meat together with vegetarian diets were noted by Aston et al. 2012, to reduce risk for diabetes, cardiovascular disease (CVD), and colorectal cancer (Aston *et al.,* 2012). Further analysis indicated that these diets were estimated to lead to about 3 per cent reduction in one of the GHGs, that is CO_2 (de Carvalho *et al.* 2013). Excessive meat intake was associated with poor diet quality and GHG emissions of approximately 4 per cent of CO_2 form agricultural production (de Carvalho *et al.* 2013). The Mediterranean diets which were characterised by limited red and processed meat and poultry to less than one

serving per week with increased sea food were associated with reductions in land use, water, energy, and GHG emissions (Meier & Christen 2012).

Recently, a global health model was created to determine valuation of the benefits of changing dietary patterns towards plant-based options by 2050 to the population health, environment, and economy (Springmann *et al.* 2016). The vegetarian diet scenarios were projected to prevent 7.3 million deaths and save 114 million life years (Springmann *et al.* 2016). The vegan diet was indicated to save 8.1 million lives and 129 million life years. However, the global health guidelines which have more meat than the prior diets were projected to prevent 5.1 million deaths and save 79 million life years (Springmann *et al.* 2016). Evidently, more lives can be saved by adopting plant-based diets.

It is estimated that GHG emissions related to consumption may increase by 51 per cent from 7.6 giga tonnes (Gt) per year in 2005/2007 to 11.4 Gt per year in the year 2050 (measured in CO_2 equivalents) (Springmann *et al.* 2016). However, the vegetarian and vegan diet were noted to have about 55 per cent and 70 per cent, respectively, less GHG emissions compared to the 2005/2007 estimates. Using the cost of illness approach, it was noted that the vegetarian and vegan diets would cost $973 billion per year and $1,067 billion per year, respectively, compared to the 735 billion saving of the global health guidelines by the year 2050 (Springmann *et al.* 2016). As such, the plant-based diets are more sustainable, economical, and beneficial for health and well-being.

The American government has recently taken an initiative to pattern its FBDGs to limit the eating patterns that will lead to the increased production of animal foods which will ultimately lead to more GHGs and climate change (Millen *et al.* 2016). However, countries in sub-Saharan Africa which have weak coping strategies and are adversely affected by climate change are yet to consider such an approach. It is high time governments in sub-Saharan Africa developed FBDGs that are environmentally sustainable for the benefit of current and future generations.

Conclusion

FBDGs are short messages designed to be easily understood for the promotion of healthy eating patterns. The current eating patterns have created a high demand for food which has to be met by increased agricultural production. However, increased agricultural food production contributes to GHG emissions that lead to climate change which in turn adversely affects agricultural production. The GHG emissions from agricultural production are projected to increase by 51 per cent by 2050, thereby worsening the current impact of climate change on food and nutrition security. The dietary guidelines in sub-Saharan Africa should urgently focus on reducing meat consumption which account for 80 per cent of the GHGs from agricultural production. This will lead to improved health and economic returns for sub-Saharan African countries that have weak resilience structures to mitigate the adverse impacts of climate change.

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ARTICLE

The Role of Culture in African Renaissance, Integration, and Sustainable Development

OLAWALE I. MAIYEGUN[1] AND ANGELA MARTINS[2]

Abstract: *One of the mandates of the African Union Commission, an organ of the African Union, is the development and implementation of cultural and environmental policies in the African Union Member States in collaboration with partners such as Pan-African Cultural Institutions and the Regional Economic Communities. It was in this context that the Charter for African Cultural Renaissance of 2006 and other policy instruments including the African Union Agenda 2063 were developed. The African Union Agenda 2063, a framework for Africa's development for the next fifty years, guides and informs initiatives by Member States to assure sustainable development of the continent. The physical surroundings and social or cultural background factors should be viewed as essential environmental elements to guarantee Africa's sustainable development and should be saved and protected as stated in the AU Agenda 2063. The linkage between culture, environment and sustainable development cannot be overemphasized.*

Keywords: *Culture, Environment, Sustainable Development, African Renaissance*

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Introduction

This article emphasizes the role of culture in the African renaissance, integration, and sustainable development. The article also briefly presents the work done by the African Union Commission (AUC) and its partners to promote the role of culture in environment and sustainable development.

Culture plays an important role in shaping the lives of the people of a community, including their socio-economic and political transformation. The major components of culture, which are central to the issue under consideration, are basically the social norms and values such as attitudes, beliefs, customs, traditions, art, clothing, food and languages of the people of a particular community, as well as achievements such as technologies that are passed on from one generation to another. According to Banks and Banks (1989),

> Most social scientists today view culture as consisting primarily of the symbolic, ideational, and intangible aspects of human societies. The essence of a culture is not its artifacts, tools, or other tangible cultural elements but how the members of the group interpret, use, and perceive them. It is the values, symbols, interpretations, and perspectives that distinguish one people from another in modernized societies; it is not material objects and other tangible aspects of human societies. People within a culture usually interpret the meaning of symbols, artifacts, and behaviors in the same or in similar ways.

Culture includes tangible and intangible heritage, which is varied, complex, and in constant evolution. The tangible heritage includes monuments or architecture, art and crafts, sites, manuscripts, books and other objects of artistic and historical interest. The intangible heritage includes language, oral traditions, performing arts, music, festive events, rituals, social practices, traditional craftsmanship, knowledge and practices concerning nature and the environment. Thus, the process of development of a people relates to culture which implies the sum of products of a society that have resulted from human creativity.

The sustainable practices concerning nature and the environment are essential in healthy societies; these practices are expressed for instance through language, oral traditions, and feelings of attachment towards a place, memories, spirituality and worldview. Thus arts and culture have a role to play in ensuring that the environment is protected for our well-being.

Culture, Environment and Sustainable Development

Culture is a catalyst for sustainable development and political transformation. Socio-economic, political, and sustainable development in Africa have been affected by internal as well as external factors. Intra and interstate conflicts have had adverse impact on the continent's development. Similarly, the slave trade, colonialism and apartheid have had detrimental effects on development in Africa. In the post-colonial Africa, the logic of socio-economic transformation is based on addressing these damages as a means of attaining sustainable development that

would improve the lives of the people. Sustainable development requires members of a given society to shift their collective consciousness, and, by consensus, refine their socio-economic and political realities. When changes sustain over time, values and attitude are held in a completely new paradigm based on different assumptions and philosophies. Thus, in the era of globalization and technological advancement, most African countries are undergoing a major transformation in the structures and location of their socio-economic activities – from rural agriculture-based economies of the colonial era to more diversified economies with much larger urban industrial and service sectors. This has environmental implications.

Traditional knowledge and practices lie at the heart of a community's culture and identity. Even though some aspects of traditional knowledge such as medicinal uses of local plant species may be of interest to scientists and corporations, many traditional practices are nevertheless disappearing. There is an urgent need to protect the natural environment through safeguarding of a community's intangible cultural heritage. The intangible cultural heritage is transmitted from generation to generation, and is constantly recreated by communities and groups, in response to their environment and history. It provides people with a sense of identity and continuity, and promotes respect for cultural diversity and human creativity.

It is in this context that the 3rd Pan-African Cultural Congress was organized by the African Union Commission in August 2012 under the theme "Culture, Societies and Sustainable Development". The following was recognized and agreed upon by congress participants for the promotion of culture as a tool for sustainable development:

- Culture constitutes a fundamental dimension of the development process and it helps to strengthen the independence, sovereignty and identity of nations;
- Development and growth have frequently been conceived in quantitative terms without taking into account its qualitative dimensions, namely the satisfaction of people's spiritual and cultural aspirations;
- Culture and cultural diversity are essential components of human development. For instance, intercultural trust is both a condition and a result of equitable development;
- The development of cultural and creative industries, as well as the promotion of cultural heritage, alongside with tourism, environment and trade represent valuable tools for community social and economic development in Africa;
- Cultural heritage if mainstreamed into national and social development policies and if properly promoted is an invaluable catalyst for sustainable human and social development, social harmony, integration and peace;
- Culture as a key dimension of peace and security, promotion of culture of peace and non-violence to achieve intercultural solidarity, intergenerational dialogue and mutual understanding;

- Culture as the pillar of sustainable development addresses the relationship between culture and sustainable development through dual means: firstly, the development of the cultural sector itself (i.e. heritage, creativity, cultural industries, crafts, cultural tourism); and secondly, ensuring that culture has its rightful place in all public policies, particularly those related to education, economy, science, communication, environment, social cohesion and international cooperation.

In a similar initiative, the Seventh AFRICITIES Summit held in Johannesburg, South Africa, from 29th November to 3rd December 2015, also stressed the paramount role that culture and the environment play to local communities. Key recommendations of the summit were:

- Establishing platforms to promote active research – policy – practice links in decision making
- Active involvement of the private sector in environmental management
- Establishing robust policy environment that addresses historical and cultural issues to safeguard the environment
- Sharing of information and experiences among cities
- Vertical integration and multi-level governance in management of resources

As can be seen from the second and third recommendations above, the Local Governments of Africa recognize the intrinsic linkage between culture and environment and take it upon themselves to develop robust policy to safeguard their culture and the environment. This view is further stressed in the Agenda 2030 and sustainable development goals (SDGs) adopted by member states. Goal Number 11 of the SDGs reads "Make cities and human settlements inclusive, safe, resilient and sustainable"; one of the targets of this goal is to protect and safeguard the world's cultural and natural heritage.

Agenda 2063[3], endorsed by the Heads of States of the African Union in January 2015, provides for an aspiration for culture: "an Africa with a strong cultural identity, common heritage, values and ethics" and for environment: "we aspire that by 2063 Africa's unique natural endowments, its environment and ecosystems, including its wildlife and wild lands are healthy, valued and protected, with climate resilient economies and communities".

All these initiatives and actions demonstrate a vital relationship between culture, environment and sustainable development as well as the concerted efforts of the African Union in deepening integration and promoting the continent's renaissance to ensure sustainable development.

[3] African Union Commission, Agenda 2063: The Africa We Want (Popular version - Final Edition), April, 2015 - http://www.un.org/en/africa/osaa/pdf/au/agenda2063.pdf

Integration, pan-Africanism and African renaissance

Integration

The Abuja Treaty of 1991 lays the foundation for the creation of the African Economic Community (AEC Treaty)[4], whereby the economies of the Member states of the African Union will be fully integrated. The goal of the AEC was to transform the fifty-three economies of Africa into a single economic monetary union with a common currency and a freely mobile capital and labour. It is the desire of the leadership of the continent as stipulated in the AU Constitutive Act to have an African Central Bank in place when the AEC is fully operational. This presupposes that Africa as a whole would have gone through all the stages of integration. The Regional Economic Communities (RECs), which constitute the building blocks of the AEC would at this stage merge their programmes into one.

The integration of Africa is further emphasized in the African Union's Agenda 2063, "Africa shall be an integrated, united, peaceful, sovereign, independent, confident and self-reliant continent". Agenda 2063 expresses seven broad aspirations resulting from stakeholder consultations. The second aspiration states that Africa wishes to be an integrated continent, politically united, based on the ideals of Pan-Africanism and the vision of African Renaissance. Milestones to be achieved for the complete integration of Africa are: a united Africa; world class integrative infrastructure; dynamic and mutually beneficial links with Diaspora; and seamless borders and management of cross-border resources. Meanwhile, implementation of the Agenda 2063 has started with the Development of Ten Year Plans.

Pan-Africanism

Pan-Africanism includes the intellectual, political and economic cooperation that should lead to the political unity of Africa. The Pan-African alternative provides a framework for African unity.

Pan-Africanism demands that the riches of Africa be used to benefit, develop, and uplift the African people. Pan-Africanism is a system of equitably sharing food, clothing, homes, education, healthcare, wealth, land, work, security of life and happiness. Pan-Africanism is the privilege of the African people to give respect and preference to their unique cultures, traditions and way of life.

African Renaissance

Since its inception in 1963, the Organization of African Unity (OAU) made every effort to promote greater African economic, social and political integration within

[4] See Treaty establishing the African Economic Community, 3 June 1991, 30 International Legal Materials 1241

the continent. The OAU was founded on the principle of promoting unity and cooperation among all African Member States and to bring an end to colonialism. The African Union (AU), the successor to the OAU, has embarked on initiatives to build a united Africa–economically independent and developed to change the lives of Africans for the better. The quest for a rebirth of Africa–the Africa Renaissance–began a long time ago. As Pixley Ka Izaka Seme noted when he spoke at New York's Columbia University in 1906[5]: "The brighter day is rising upon Africa...Yes the regeneration of Africa belongs to this new and powerful period. The African people...possess a common fundamental sentiment which is everywhere manifest, crystallizing itself into one common controlling idea...The regeneration of Africa means that a new and unique civilization is soon to be added to the world."

The African Solidarity Initiative (ASI)[6] was launched by the AU in 2012 in order to mobilize, from within the continent, increased support for post-conflict reconstruction and development efforts. The ASI is intended to provide an opportunity for mobilizing additional commitments and contributions to support on-going efforts in post-conflict reconstruction and development in a number of African countries. The initiative is designed to encourage, motivate, and empower African countries to begin offering systematic assistance to post-conflict countries. The overall intention of the ASI is to promote African solidarity and support, as part of an agenda to address the magnitude of challenges being faced by African countries engaged in post-conflict reconstruction and development efforts.

In order to ensure the rebirth of Africa, there is a need for increased African solidarity, socio-economic, cultural and political rebirth and a re-orientation of the African mindset to the gains we will achieve though promoting the African Cultural Renaissance and ensuring full integration of our beloved continent.

Promoting a Culture for Peace

The United Nations Educational, Scientific and Cultural Organization (UNESCO), in collaboration with the Government of Angola and the African Union Commission, organized in March 2014 a conference titled "Sources and Resources for a Culture for Peace."

Recognizing the importance of UNESCO's experience with a Culture of Peace, the United Nations General Assembly established since 1997 a separate agenda item entitled "Towards a Culture of Peace" (the last GA resolution was 66/116 of 22 February 2012). By resolution 52/13 of 1998, the United Nations General Assembly stipulated that a culture of peace:

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[5] See the speech at, http://www.sahistory.org.za/archive/regeneration-africa-speech-pixley-seme-5-april-1906

[6] Decision - Assembly/AU/Dec.425 (XIX) - on the African Solidarity Initiative, launched in July 2012 at the 19th Ordinary Session of the policy organs of the African Union held in Addis Ababa.

> *consists of values, attitudes and behaviours that reflect and inspire social interaction and sharing based on the principles of freedom, justice and democracy, all human rights, tolerance and solidarity, that reject violence and endeavour to prevent conflicts by tackling their root causes to solve problems through dialogue and negotiation and that guarantee the full exercise of all rights and the means to participate fully in the development process of their society.*

The Declaration and Programme of action on a Culture of Peace, adopted by the United Nations General Assembly in its resolution 53/243 of 1999, defined eight action areas to be linked through the concept of a culture of peace and non-violence into a single coherent approach:

- Fostering a culture of peace through education;
- Promoting sustainable economic and social development;
- Promoting respect for all human rights;
- Ensuring equality between women and men;
- Fostering democratic participation;
- Advancing understanding, tolerance and solidarity;
- Supporting participatory communication and the free flow of information and knowledge;
- Promoting international peace and security.

A culture of peace is a very crucial element for the promotion of Africa's integration, stability, solidarity and African renaissance which will in turn impact sustainable economic and social development.

Conclusion

Culture continues to play key roles in environmental processes, including serving as a platform for sustainable home-grown approaches and traditional indigenous practices. Culture has the potential to lead holistic approaches that mitigate the environmental problems that face not just cities in Africa but its people and communities.

The COP 21 conference on Climate Change concluded in Paris last year with optimism. The conference was attended by many African urban planners, thus instilling hope in local policies that mitigate environmental degradation.

Certainly, culture is an all-encompassing phenomenon that finds true expression in economic, human social development and environment. According to the OAU Pan-African Cultural Manifesto of 1969, "Culture starts with the people as creators of themselves and as transformers of their environment." Thus, culture must be at the centre of all human endeavours. Sustainable socioeconomic development in Africa must focus on Africa's cultures with emphasis on language as the main

pillar of culture. Language is the most important feature in developing the capacity of a people; it is a repository of past knowledge thus the basis for the development and integration of new knowledge into a society. Communities which have moved forward scientifically and technologically have done so largely on the development and use of the cultures and languages of the people. Thus, African culture is the main vector for sustainable development.

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The Green Belt Movement's Bamboo Biomass Entrepreneurship Project

AISHA KARANJA[1]

The Green Belt Movement (GBM) was founded in 1977 by the late Professor Wangari Maathai. What began as a grassroots tree planting programme to address the challenges of deforestation, soil erosion, and lack of water, is now a vehicle for empowering women and communities. The organization's mission is to strive for better environmental management, community empowerment, and livelihood improvement, using tree-planting as an entry point. We have an extensive grassroots network that mobilizes communities around local development activities. To date, GBM has facilitated the formation and sustenance of over 4,000 community groups, of which 70% are women.

Energy access is a massive development challenge in Sub-Saharan Africa. Less than 7% of rural households in Kenya have access to electricity, and more than 90% of the rural population depends on firewood for cooking and heating. Harvesting of firewood and production of charcoal are huge and growing threats to Kenya's indigenous forests and biodiversity. For instance, the closed canopy forest has been reduced to less than 2%.

Community mobilization

[1] Executive Director, The Green Belt Movement. Email: communication@greenbeltmovement.org

In the foreseeable future, Kenya will need access to sustainable sources of firewood, charcoal, and other forest products at a massive scale, if any natural forests are to remain. One of these sources could be bamboo, a cash crop with many uses and benefits: rapid growth, high income potential, source of firewood and easy to convert to charcoal. Standing forests of bamboo also capture carbon and slow the process of climate change.

The Green Belt Movement has established a bamboo biomass and entrepreneurship project aimed at promoting the planting of indigenous bamboo for conservation, climate mitigation benefits, fuel source (firewood and charcoal), and economic opportunities through green businesses for and by local communities. In this pilot project, GBM is engaging tree nursery groups in Maragua constituency, Murang'a County, who have grown more than 1,400 seedlings to date. The GBM-led project has been well received.

Bamboo planting

The opportunity for bamboo as a source of biomass energy is immense and the biomass benefits of bamboo are impressive: from the same acreage, bamboo gives

Community training on how to make simple products

4.5 times more biomass than eucalyptus. The rapid turnover and consequently high production of biomass makes bamboo suitable as feedstock for cooking stoves. Bamboo is renewable and can be used on degraded land. It also lends itself very well for energy plantations because the heating and burning value of bamboo is also high. It has been estimated that for the next 40 years in Africa, biomass energy will continue to be a major part of the energy equation. Success in this area, therefore, will necessarily have to include alternative biomass feedstock for firewood and charcoal production. Green biomass can indeed be viewed as a source of renewable energy.

Our experience shows that engagement at the grassroots level is crucial for the introduction of new ideas and sustainability of projects. When the communities understand the linkage amongst their actions, environment, and their livelihood situations, they are more likely to muster their energies and take action for change.

Kufunda Learning Village: Recovering the Human Spirit for Health and Wholeness

MARIANNE KNUTH[1]

Built on the experience of a country and a people full of resource and capacity, Kufunda Learning Village has been growing for about 15 years in the centre of Zimbabwe. Kufunda Village was founded in 2002, by a woman of Danish and Zimbabwean origins. In her view, in focussing on what *was not,* people were losing their capacity to work with what was already here, and losing access to their wealth and resource.

As a Learning Village, Kufunda has sought to learn, live, and share practices and systems that enable a healthy and vibrant community. Kufunda is a place where we work with the resources that are already present, finding creative, generative ways to expand them and then sharing them with other rural and urban communities.

Discussions in Kufunda Village

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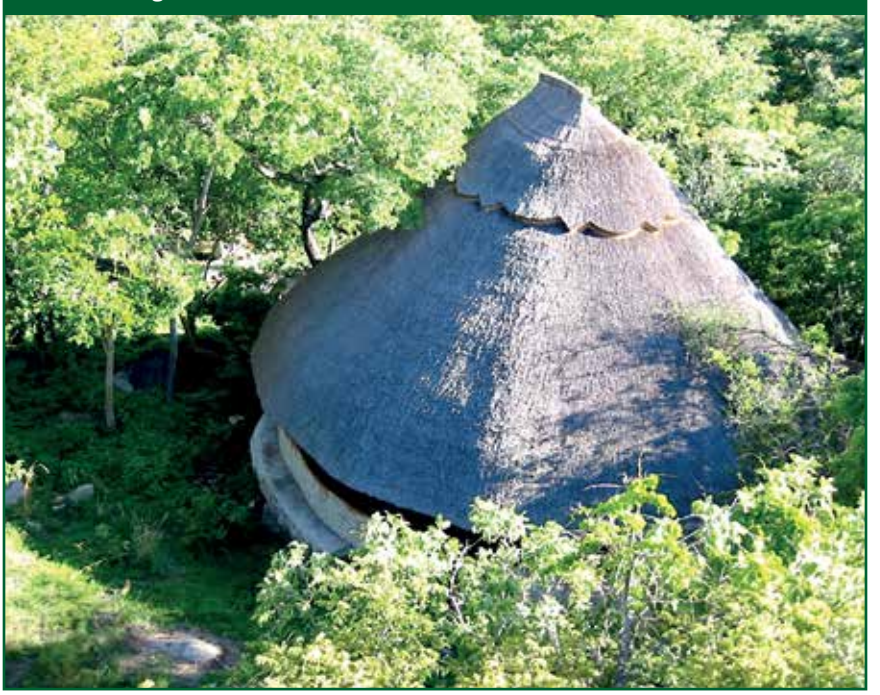
One of the key learnings to emerge is that the recovery of the human spirit is central to creating health and wholeness in village life. There can be no sustainable life or livelihood without recovery, healing, and an inner journey to self. Kufunda aims to be a sustainable village and from the beginning we have attempted to engage with our land. We built composting toilets, engaged in permaculture and experimented with eco-building, organic farming, and natural remedies. As we have been learning, we have been sharing with our rural partner communities. But it is only in the last 5 years that we have realized that being true to our heart, really living with appreciation of what we have, nurturing our core strengths – is core to what enables us to really live sustainably. We are committed to supporting and nurturing the inherent health and wholeness that we know resides in all people and communities. As we all open to and experience the reality of this, magic and possibility arise that can never be accessed when we meet people as either poor or in need of assistance and development. We choose to meet people in their health, in their wisdom, in their wholeness—and from this place enormous potential is revealed.

Kufunda Village



There is an incredible power that is released when we choose this stance. We seek to empower many of the young women we work with to mitigate their sense of quiet despair in relation to their situation. As a rural woman grows up, she

moves from being the property of her family, on to becoming the property of her husband. There are less fortunate women, including single mothers, who live with the trauma of abuse and sexual assault. Most of them are resigned to a 'this is a woman's fate' sense of inevitability.

From the 22nd of February to the 18th of March 2016, eighteen young women spent a month at Kufunda Village in a programme called *Young Women are Medicine*. It is a programme to affirm them and help them reconnect with the Medicine that (given the right conditions) they naturally bring into the world. The programme supports them to know their gifts and their potency.

It has been an extraordinary journey of healing. One month after graduation from *Young Women are Medicine* programme, the women looked much healthier than their matriculating counterparts. The programme is making a positive difference.

Creating a space of trust, where each was welcomed as they were, we journeyed as a group, in an exploration of the heart of each woman. In this way, we found that human kindness was allowed to reach beyond the walls of trauma into collaborative healing and inspiration.

Fundamental questions are raised from these experiences at Kufunda: How can we create healthy vibrant communities if we are in survival mode? Just managing to get by, hearts closed and mistrust ripe? Not daring to listen to the dreams of the soul, to the call of something larger?

For a month we nurtured these women. We supported them as they took their journeys of challenge and hardship, as they began the long process of releasing some of the hurt, and as they listened to the beckoning of what might be possible. They began to speak of dreams they held for themselves and their family, to see the futility of blame, and to know the sense of power and freedom that comes through choosing to take responsibility for themselves and for their future path.

The next steps are unlikely to be easy. Something has been awakened in them and yet they are returning to where people are still living old stories that are too small for the life of the soul. They will need to stay in touch with this part of themselves that is asking for more - not more in terms of material wealth or resource, but in terms of living in resonance with what brings them into deep contact with a sense of inner freedom and connection.

The lifeblood of sustainable systems is the aliveness that comes when the human heart is heard, truly met, and given the space to grieve and heal. For the village to thrive and the outer and visible ecology to come into health, the inner and often invisible ecology of human relationships needs tending. From our work over the years we are learning that this kind of change cannot be in the individual alone. These are journeys of individuals in community. And so, the work continues with individuals and communities in symbiosis, finding their way together, into a fuller expression of the goodness, beauty, and effectiveness of what is already there; the health and wholeness that are already available. And in living this way, space is created for more and more of what really matters.

About Kufunda Village: *Kufunda is dedicated to learning its way into what it takes to build a healthy vibrant community. In addition to our experiments with permaculture, organic farming, eco-building, herbal practice, and renewable energy, Kufunda runs several programmes in support of individual and community well-being. The programmes include the Young Women are Medicine; a six month Leadership for Sustainable Community programme; and a shorter Participatory Leadership Programme. We have also started a Waldorf-inspired primary school for our children, so they will grow up continuing to believe in the power of their own imagination and creativity.*

For more information, visit <www.kufunda.org>

Barefoot Women Solar Engineers: An Initiative having Impact in Africa

BUNKER ROY[1]

First they ignore you, then they laugh at you, then they fight you and then you win– Mahatma Gandhi

Mahatma Gandhi said the ultimate solution for fighting poverty in India was not mass production but production by the masses. This is true for Africa. If we are to contain massive migration in Africa from the rural areas to the urban; if we are to preserve the rich traditional knowledge, village skills, and practical wisdom in Africa from fast disappearing into the cities; if we are to protect and improve the quality of life of villages; then we have to apply the Gandhian model to solar electrifying villages and think and act outside the box. We need to trust and believe in the capacity and competence of very ordinary men and women living in remote villages in Africa to identify technical problems and offer technical solutions.

Barefoot College

Forty years of experience have taught Barefoot College that formal education and qualifications are not required for the rural poor to bring sustainable energy, clean water, and sustainable livelihoods to their communities. The College today stands as one of the very few Indian organizations that have successfully taken a leading role in setting new development paradigms. This involves scaling a community-based model to worldwide proportions by adopting a globally diverse, decentralized approach to implementing large-scale solutions. For forty years it has been proved that the need to change, learn, unlearn, relearn, and encompass diversity of workforce are the keys to making a constant relevant impact.

What Africa needs to adopt is a demystified decentralised model where poor rural people of Africa without formal education are trained to fabricate, install, repair, and maintain their own solar systems. The Gandhian Model believes solar technology must not deprive people of work in villages. Technology that will

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improve the quality of life immediately and tangibly must be selected. Finally, the choice of solar technology should be such that the people could maintain it themselves.

Experience has shown that the formal educational system discourages the youth from staying in the rural areas. Conventionally, the youth acquire skills that translate into better job prospects in the cities, making rural-urban migration inevitable. The majority of the people we find in villages today are either very old or very young. Thus, it is important to imagine projects that can be sustained by the said age group. It is in this light that I propose the idea of empowering old women to serve as solar engineers in the rural areas. The old women are not interested in going to cities to look for jobs. They are not interested in certificates that the youth are desperate to get. They will stay and serve their communities and pass their knowledge and skills to the younger generation.

It is necessary to empower women to assemble, install, repair, maintain, and sell solar systems in their own villages. I challenge the regular school system to stop issuing certificates that do not have any value today, and, instead, to concentrate on practical skills that will make a visible difference to the lives of people. It is time we saved millions of litres of kerosene from polluting the environment. Instead of subsidizing the rich to produce cheaper solar panels in urban areas, we need to subsidise the solar systems to provide light to remote non-electrified villages on

Training Solar Mamas from Africa, Barefoot College

the condition that the poor pay for repair and maintenance, thus, creating work with dignity. This would generate self-sufficient solar electrified villages, create over 50,000 jobs in the rural areas in Africa, and curb migration to the cities.

For women who have rarely left their own village, it requires undeniable courage and endurance to leave for the first time to travel to a far-off land (India) where everything, from surroundings, language, food and weather, to clothes, culture and habits, is different. The first month is a period of many adjustments in their lives but with time, care and support from their trainers (who are also semi-literate), they learn to adapt. 'Learning by doing' is the practical philosophy adopted for training by the Barefoot College. In the first weeks of the six months of training, the emphasis is on making trainees feel at home and enabling them to familiarize themselves with different terms, tools, components, and equipment used in solar technology. Practical demonstrations or 'hands-on' experience and regular repetition help the trainees remember terms, tools, equipment and components. With each passing day, their level of hesitancy decreases and their confidence and 'technical dexterity' increases. The presence of international women trainees creates a positive environment of cultural diversity but at the same time raises concerns over language and communication. The need for expression gives birth to a unique combination of gestures, signs, and broken English cutting across all language barriers. This unique 'language' consisting of a combination of hands, sight, and sound remains the means of training and conversation.

The challenges for women and girls in Africa are profound. There is a critical and urgent need to innovate and develop new definitions and access to 'education' in all its forms to allow women to overcome obstacles to livelihood activity.

Some special aspects of the Barefoot Model in Africa:

- Barefoot College (BC) is the only community-based organization (CBO) in the world that clearly makes a distinction between literacy and education. Just because someone rural is illiterate does not mean that the person is uneducated.
- BC is the only community-based organization (CBO) in the world that targets illiterate rural grandmothers and trains them to be solar engineers in 6 months. Over 300 grandmothers have been trained from 34 countries in the entire continent of Africa.
- BC is the only CBO in the world that has reached 40 of the 47 Least Developed Countries identified by the United Nations Development Programme (UNDP).
- The global message of simplicity, austerity, collective decision-making, and compassion in action makes it a very special and unique organization to train rural grandmothers from Africa.

Most conventional development solutions that target the rural poor have failed to take hold at the village level. These solutions miss the mark in two ways: first, they rely on tools and technologies that are overwrought with complicated installations or upkeep, creating communities dependent on outside help. And second, they ignore a large group of people (the rural poor) able to learn new skills

to generate their own livelihoods and, more importantly, sustain solutions over time. Development organizations too often neglect the knowledge, wisdom, and skills of the world's poorest, on the assumption that a lack of formal education renders them unfit to contribute meaningfully to society.

Impact

In 2008, the Ministry of External Affairs, Government of India, recognized the Barefoot College as a training institute under the India Technical Economic Cooperation (ITEC) programme. It was the first NGO to have been recognized by the Government of India, specifically to train illiterate rural women in Africa to address the serious issues concerning climate change.

African Solar Mama learning how to fabricate charge controlle

The highlights since 2008 are worth mentioning

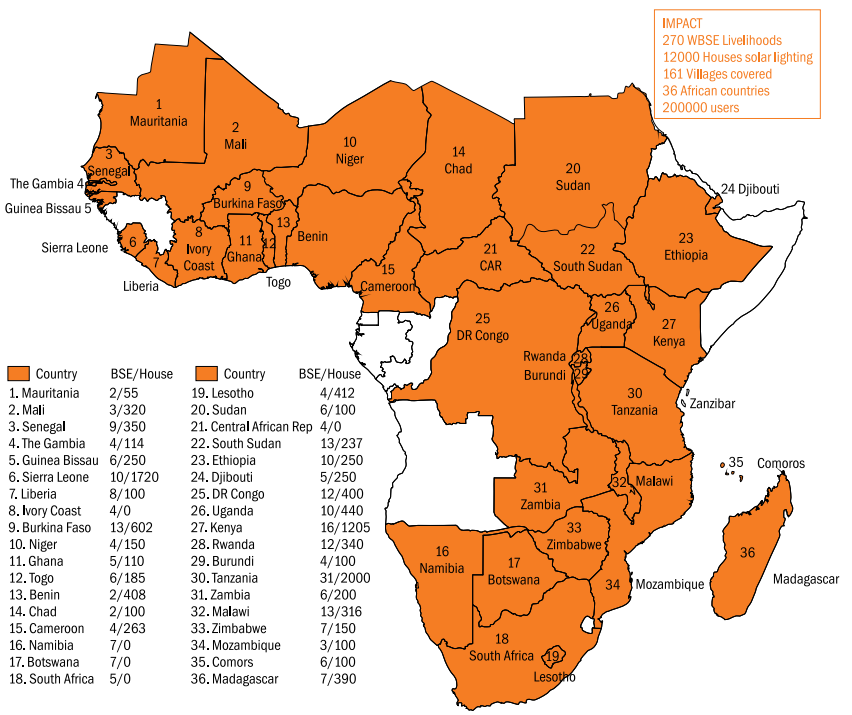
- Between 2008 and 2010, 12 illiterate women were trained from Sierra Leone. They solar electrified the two villages of Kontaline and Mambioma all on their own. So impressed and influenced was the Government of Sierra Leone that the President built the first Barefoot Training Centre at a cost of nearly USD 800,000. The objective was to train 150 grandmothers to enable them to solar electrify their own villages across the country. One of the twelve trainees, Nancy Kanu, registered the first Barefoot Women Solar Engineer Association in Sierra Leone and became its first chairperson. The Association influenced the Government to place an order for 5,000 more solar systems to be installed by the trained grandmothers.

- The Ministry of External Affairs has mandated the Barefoot College as an implementing agency to establish five Regional Barefoot Training Centres in Africa—Burkina Faso, Liberia, Senegal, Tanzania, and South Sudan—at a cost of USD 400,000 each. The Sixth Barefoot Vocational Centre was inaugurated by the President of Zanzibar in August 2015, and the Government of Zanzibar approved an amount of USD 250,000 for the Centre; the first of its kind in the history of Zanzibar.

At the launch of each centre, Barefoot College professionals, together with Women Barefoot Solar Engineers (WBSEs) from each country, who have been trained in Tilonia, established a solar programme and trained the first locally trained groups of women solar engineers to electrify their villages. Barefoot College then provided technical assistance to ground partners to oversee training and ongoing operations of the centres. Once fully operational, each centre trains up to 40 women (mostly grandmothers) over the next two years. Each of these 'solar

Africa ITEC Map 2015

270 Women Barefoot solar engineers trained under ITEC programme at the Barefoot College Tilonia Rajasthan in 15 courses from September 2008 and solar electrified 12000 houses in 161 villages of 36 African countries



Country	BSE/House	Country	BSE/House
1. Mauritania	2/55	19. Lesotho	4/412
2. Mali	3/320	20. Sudan	6/100
3. Senegal	9/350	21. Central African Rep	4/0
4. The Gambia	4/114	22. South Sudan	13/237
5. Guinea Bissau	6/250	23. Ethiopia	10/250
6. Sierra Leone	10/1720	24. Djibouti	5/250
7. Liberia	8/100	25. DR Congo	12/400
8. Ivory Coast	4/0	26. Uganda	10/440
9. Burkina Faso	13/602	27. Kenya	16/1205
10. Niger	4/150	28. Rwanda	12/340
11. Ghana	5/110	29. Burundi	4/100
12. Togo	6/185	30. Tanzania	31/2000
13. Benin	2/408	31. Zambia	6/200
14. Chad	2/100	32. Malawi	13/316
15. Cameroon	4/263	33. Zimbabwe	7/150
16. Namibia	7/0	34. Mozambique	3/100
17. Botswana	7/0	35. Comors	6/100
18. South Africa	5/0	36. Madagascar	7/390

1. Cost of 12000 houses solar electrification @ $400/house = $4.8 million
2. Training cost with traveling of 270 BSE@$7000/trainee = $1.9 million
3. Annual saving of kerosenein lighting @ 5 litre/house = Litre 0.8 milliom
4. 200000 people accessing solar lighting in 161 villages in the last 7 years

grandmothers' have the capacity and equipment to solar electrify 40 households, bringing inexpensive, reliable, and clean energy to a total of 3,200 homes of approximately 20,000 people, in just two years. Every WBSE is taught to 'train on' her skills.

At the end of six months, the trainees graduate as Women Barefoot Solar Engineers (WBSE). As per the prior agreements with their villages, the 'graduates' go back to their respective villages and electrify the households. They assume the responsibility of repair and maintenance for a minimum of 5 years. Barefoot solar engineers sustain and replicate solar technology in rural communities, change the perception of professionals for rural villages, and challenge both age and gender barriers. Every Woman Barefoot Solar engineer is *trained to train*; this unique skill implies that her ability to scale her own knowledge is without limitation.

This ongoing commitment will create the first ever international network of learning institutions, focussed on delivering knowledge across literacy barriers, to those previously left out of the traditional education system. The next step is to take Barefoot College's proven, place-based rural development model to six new countries and deepen its reach in 15 countries.

In addition to the foundational solar programme, the training centres will, over time, incorporate Barefoot programming, including water management; children's and adult education; financial and enterprise skill-building; preventative health and hygiene; artisan development; women's empowerment and reproductive rights; community self-sufficiency; and civil society skills.

- Today, 270 solar grandmothers have solar electrified 12,000 houses in 161 villages across 36 countries in the continent of Africa at a total cost of $4.8 million. Nearly 200,000 men, women, and children have directly benefitted and improved their quality of life.
- The Government of India is considering solar electrifying an additional 7,500 more houses through the 270 trained solar mamas in 15 countries in Africa by 2017.

Partnership

This could not have been possible without a partnership involving the following stakeholders:

- Government of India providing the travel and training costs under ITEC to be trained for 6 months in the Barefoot College, India.
- UNWOMEN, UNESCO, UNDP/GEF Small Grants Programme, and private foundations (Skoll,Enel Green Power) providing the funds for the hardware. The hardware includes a 40 W solar panel (with deep cycle battery providing light for 4 hours for 6 years) which powers three LED lights, one mobile charger, one fan and a radio.

- The rural communities paying monthly for the repair and maintenance. The first technically and financially self-sufficient solar electrified villages in the world.

The future of Africa will be determined by a partnership model where the government, the private sector, the NGO, and the community are equal partners and every one's role is clearly defined. The future of Africa lies in South–South Cooperation between communities learning and unlearning from each other.

Africa's Energy Revolution from the Ground Up

IVAN AMANIGA RUHANGA[1]

Within the lens of the Sustainable Development Goals (SDGs), Africa is on the verge of an opportunity as the world pledges to end poverty, promote sustainable development, ensure a healthier environment, better lives, and access to affordable, sustainable, clean energy for all. *Global Trends in Renewable Energy Investment 2016*, the tenth edition of the United Nations Environment Programme's (UNEP) annual publication, says the annual global investment in new renewables capacity, at $266 billion, was more than double the estimated $130 billion invested in coal and gas power stations in 2015. From the onset of 2004, the world has invested $2.3 trillion in renewable energy with Africa taking a fair share of this boost (UNEP 2016).

Earth Hour 2016 celebration in Kampala, Uganda

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It is abundantly clear that change is sweeping across Africa in the energy space. Africa is uniquely positioned in a time of unprecedented risk but also unparalleled opportunity for the wider future of the planet and society. This is a time when science is clearer than ever before, awareness is at an all-time high, commitments are more ambitious and innovation more impactful. There is renewed commitment towards sustainable energy development in the world. The SDGs, the Paris Climate Agreement, the United Nations Sustainable Energy for All Initiative, Power Africa, Power for All, and Africa Development Bank's New Energy Deal for Africa, unite to demonstrate this momentum uncharacteristic of ordinary times. Furthermore, a growing number of corporations are committed to addressing climate change, assuming responsibility for using natural resources sustainably and greening their supply chains. Importantly, millions of people are also making their voices heard about the future they want and energy is consistently highlighted as a key driver.

The continent is committed to purpose-mandate driven energy transformational outcomes that target both macro and local micro demands and pressing needs.

As rightly observed by UNEP Executive Director Achim Steiner, "Renewables are becoming ever more central to our low-carbon lifestyles, and the record-setting investments in 2015 are further proof of this trend. Importantly, for the first time in 2015, renewables in investments were higher in developing countries than developed." There is an ongoing shift in investment towards developing countries and away from developed economies by economic giants across the globe. These include China's renewed interests in the development of Africa, an opportunity

Fuelwood is the elephant in the room, which cannot be ignored. It meets about 80% of energy needs in Sub-Saharan Africa

that energy actors on the continent are looking to exploit through the Forum for China–Africa Cooperation (FOCAC).

Since early 2000, international development and conservation agencies have stepped up their transformational pursuits with energy access at the centre of their efforts. The World Wide Fund for Nature (WWF) has registered significant milestones in this regard. The organization posits that energy access has the potential to offer profound improvements in quality of life while maximizing opportunities for human beings and nature to interact harmoniously. In East and Southern Africa alone, WWF has piloted 6 clean energy access initiatives at district, county, and village levels in Uganda, Tanzania, Zambia, and Kenya between 2012 and 2015. To illustrate the commitment, between 2007 and 2014, WWF working in East and Southern Africa has directly and indirectly facilitated the distribution of nearly 100,000 energy-efficient clean cook-stoves—saving 6.4 million trees from being cut down for fuel wood per annum; that is, the same area required to plant 35,000 ha of forest per annum.

One of the most intriguing aspects of these developments in Africa is the momentum across a network of actors to collectively and individually drive the energy access agenda as a sure means towards addressing current and future potential challenges such as population explosion, infrastructure development as well as oil and gas developments in most of the countries. It is much clearer to actors in the energy space that more strategic partnerships and intensified capacity strengthening are critical to the translation of international, regional, and national commitments into products and services that deliver physical accountability to the common people. There is ongoing work around stimulating the interest of donor groups and the private sector to balance their focus on energy between large dams and the basic needs of the rural communities, including clean energy for household cooking and lighting. It is in such changes that Africa can catapult into the middle class society that is envisaged in the SDGs.

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Women-led Social Enterprises: Trade and Impact Movement

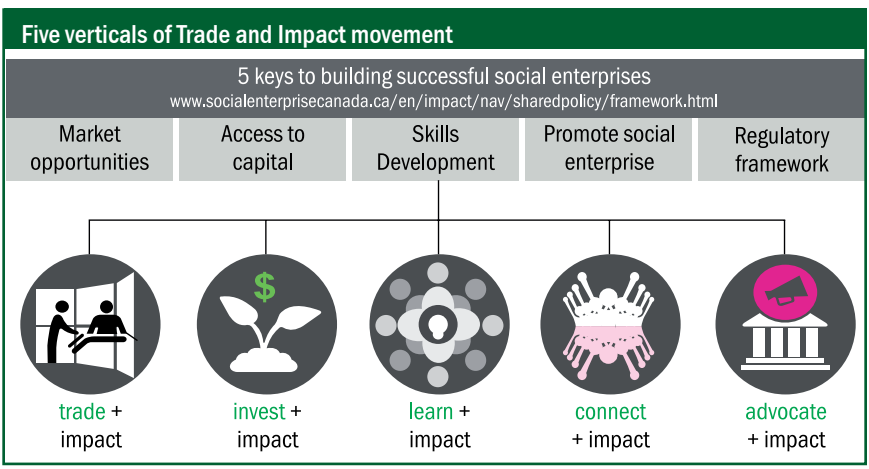
SOPHIE OTIENDE[1] AND SHAREEFA FADHE

"The evidence should be clear to everyone by now: countries that include women are more economically competitive. Businesses owned by women make considerable contributions to their national economies. But too often, their growth is limited by unfair, unequal barriers."

US Secretary of State Hillary Rodham Clinton

When more women work, economies grow. An increase in female labour force participation—or a reduction in the gap between women and men's labour force participation—results in faster economic growth.

However, businesswomen all too frequently face barriers that undermine their ability to start or expand their business. Women-led social enterprises in developing countries face major bureaucratic obstacles, though they form 40 per cent to 50 per cent of small businesses. Examples include Swaziland where women



require the permission of husbands or fathers to open a bank account or a business,

[1] Trade and Impact; Email: sophieotiende@gmail. com

obtain a passport or enforce a contract and in Tanzania where women rarely are allowed to own land to use as collateral for business loans, leaving them with no access to formal finance. Relatedly women also face several legal and regulatory barriers in terms of access to finance, business training, and sales and marketing expertise, including access to markets and buyers.

The trade and impact movement is focussed on women-led social enterprises across Africa and the Middle East and—more importantly—how to increase the impact of those enterprises within their communities and beyond. The fundamental concept of Trade + Impact is to create awareness in the importance of women-led social enterprises and the need to foster these through forums, investment, skill development, and advocacy. Trade and impact rests on five pillars—trade, invest, learn, connect, and advocate—to develop personally and professionally and thereby increase the impact on themselves and their communities.

In the first annual **Trade + Impact** Summit, female social entrepreneurs from over 25 countries will join together to GROW, LEARN, and SHARE. Trade and Impact is hosting its inaugural summit in Morocco, presenting female social entrepreneurs with an array of services and opportunities ranging from educational panels, forums, workshops, and exhibition areas alongside policy and advocacy discussions. Trade and Impact is also dedicating a major component of the summit for innovative business solutions. With the rapid and changing development of technology, women need to be in the game if not ahead, thus the need to be technology savvy and equipped with the latest technology to support their businesses.

The Trade and Impact initiative is not about driving profits for the few; instead, it seeks profound positive impact on communities. Trade and impact affiliated enterprises are feeding into projects related to water, education, health or microenterprise. They are coming up with solutions to community challenges. Meanwhile, the Trade and Impact movement strives to create and advocate for an enabling environment so that such businesses can thrive.

It has long been observed that the role of women is to unify. While tremendous social benefits can be derived from a society of economically empowered women that work together, it is extremely important that governments guarantee good environment and more opportunities for these women-led social enterprises.

Website: Details of Trade and Impact movement can be accessed from http://www.tradeandimpact.com/

Can South Africa Strike the Balance between 'Sustainable' and 'Development'?

CHELSEA MARKOWITZ[1] AND CYRIL PRINSLOO[2]

Discussions around the concept of 'sustainable development' have gained increasing traction across numerous platforms over the past decades. The 1987 World Commission on Environment and Development defines sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' and the more recent conceptualisation of 'sustainable development' gathered from the United Nations Sustainable Development Goals considers a wide range of issues, such as health, education, equality, etc. At the core of this debate, sustainable development often comprises an equal weighting of three inter-related themes: economic development combined with environmental and social safeguards. There is significant scope for African countries, as they continue on their path towards greater development, to learn from best and worst sustainable practices—both abroad and in the continent.

In the process of promoting economic growth, environmental and social safeguards have often been neglected. Cases from developed countries (the 'West') as they industrialised throughout the 19th and the 20th centuries abound and are well-documented. Even the 'next generation' of developing countries, as they gear themselves towards developed country status, have experienced the effects of unchecked economic growth on social inclusion and environmental protection. South Africa is one of the world's largest CO_2 emitters per capita due to its heavy reliance on coal-generated electricity, and is by no means a shining example of sustainable development. However, development projects that address socio-economic challenges in a sustainable manner have emerged in recent years. One of the first major steps in this process, albeit ignored for most part of the last two decades, has been the codification of economic, environmental, and social rights in South Africa's post-1994 constitution. The constitution clearly states that

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South Africans have the right to have "the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."[3]

South Africa's people-centred Constitution has paved the way for a particularly extensive legal framework which promotes sustainable development. The 1998 National Environmental Management Act calls for Integrated Environmental Management, which ensures that sustainability measures are taken throughout the lifecycle of projects such as dams or mines. On par with developed countries throughout the world, Environmental Impact Assessment regulations also mandate stringent pre-project environmental and social impact assessments for all large infrastructure projects. Throughout implementation, projects are required to release Environmental Management Plans for sensitive aspects of projects such as community displacement or wetland disturbance. Environmental Monitoring Committees must also be created where project proponents can engage with affected community members on outstanding environmental and social concerns. Although South Africa's environmental legislation has made significant inroads and is strong by global standards, these social and environmental checks are often merely a tick-box' process, with project proponents following minimal requirements and regarding sustainability issues as more symbolic than substantial.

More recently, however, greater efforts have been made by the South African government to drive sustainable growth. South Africa's Renewable Energy Independent Power Producers Procurement Programme has been lauded globally as a significant success. Not only did the government manage to procure more than 6000 MW of electricity from renewable energy sources (nearly 5 per cent of the country's total generation capacity) between 2011 and 2016, it also managed to attract more than R160 billion worth of investment, created more than 100 000 jobs and contributed to a reduction of 4.4 million tonnes of carbon emissions.[4] This development, thus, fulfills both the social and environmental components of sustainable development, through job creation and green energy.

Despite this strong legal framework and a clear commitment to renewable energy from the South African government, policy making and decisions have not always been clear and transparent. The country is currently adding to its already heavy reliance on coal-powered electricity by constructing the world's 4th and 5th largest coal-fired power plants (Medupi and Kusile, respectively), attracting widespread condemnation from many civil society groups. This is partly due to the environmental degradation resulting from these stations, but also due to a lack of transparency, with suggestions of political interference, ultimately resulting in

[3] South Africa, The Bill of Rights of the Constitution of the Republic of South Africa. 1996.

[4] Naddiep K, 'SA's renewable energy plan a global success story', Business Day Online, 7 October 2015, http://www.bdlive.co.za/opinion/2015/10/07/sas-renewable-energy-plan-a-global-success-story

significant cost and time overruns in the delivery of these two stations. Currently, mooted plans to build six new nuclear power plants in South Africa have faced similar concerns and criticisms.

While the above discussion focuses primarily on successes and challenges of large infrastructure projects, South Africa has also made concerted efforts to ensure environmental protection outside of this ambit, specifically in the tourism sector. Tourism currently supports one out of every 12 jobs in South Africa, and it is estimated that the industry will contribute more than R500 billion to the economy by 2020.[5] In order to protect the highly diverse and rich environmental and cultural heritage of South Africa, some successful initiatives have been launched. Fair Trade Tourism South Africa is an NGO which is leading the way by giving certification to any tourism entities in South Africa which promote equitable and sustainable tourism. Certifications are awarded based on global sustainable tourism standards as well as pertinent local issues such as skills development for those previously disenfranchised from apartheid. For example, Bulungula Lodge in the Eastern Cape of South Africa is solar powered and the Lodge is run completely by the local village, and proceeds from a stay at Grootbos Nature Reserve in the Western Cape contribute towards biodiversity conservation and local small enterprise development.

As African countries move upward in their development trajectory, they should take note of some of these lessons. While a perfect example of sustainable development that equally promotes economic, environmental, and social aspects is difficult to find, there certainly exist good and bad examples. Drawing on these lessons and best practice cases can help countries avoid the development curse of the past.

[5] "South Africa's Tourism Industry" South Africa.info, 7 December, 2012, http://www.southafrica.info/business/economy/sectors/tourism-overview.htm#.Vxd3vfl9600

The Basket as Bridge – Weaving Human Exchange

EUGENIE DRAKES[1] AND HOWARD DRAKES[2]

The basket bridge leads us to the beautiful Kingdom of Swaziland, a landlocked, mountainous country in Southern Africa. At the foot of rolling green hills lives a community whose way of life is still shaped and guided by the inherited practices and ancient values of previous generations. Women would sit together under the shade of trees, talking as they wove baskets from fibres of the invasive sisal plant. Practiced since time immemorial, the tradition was handed down through the generations by the elder women to their daughters and granddaughters.

The art of weaving served the purpose of creating functional objects that were used in daily life. For example, the baskets used to store food, to bring people together, and strengthen social bonds. However, the transitions brought by colonization and independence impacted this way of life. One such change was the influx of visitors to the small kingdom of Swaziland. Many of these visitors showed an appreciation for the beauty and uniqueness of the baskets by buying them.

In response, Tintsaba was founded by Sheila Freemantle in 1985. Tintsaba started a business project designed to market the local women's traditional handicraft and to use the proceeds to support their livelihood. The foundation of this business was a set of values – respect for the culture of weaving, respect for one another, respect for the earth that provides fibres used for weaving, and a passion for quality. Done properly, the belief was that the tradition of basket weaving could be a means to provide a sustainable livelihood for the weavers in the modern context.

This was the case until Tintsaba's recent realization that it needed to make changes to sustain the appeal of the baskets. But how? Was it possible to take something that was relatively static – the method, style, and patterns of the baskets were standardized and unchanged – and update it to attract a global audience? The humble basket needed to be given a new expression that would be relevant

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to people with contemporary tastes. On the one hand, the weavers had to keep up with a world driven by trends and changing values, and, on the other, they had to avoid altering the baskets so much that the tradition is alienated or lost. Was it possible to create a balance between the differing needs of the old and new, of culture and business?

This was the challenge presented to Piece, a business specialising in the handcraft sector for the past sixteen years. As a consultancy and retailer, Piece specialises in facilitating handcraft business growth through market-driven product development by using tradition as the root of the design process. As a go between the maker and market, Piece operates as a translator between very different worlds. The following questions are typically asked in this process:

How can we maintain a sense of continuity and rootedness in a world of constant change? Can we retain our heritage and mores in a world where value is the dominant means of exchange? Can development be meaningful enough to meet the differing needs of diverse human groups and populations? Indeed, can exchange ever be mutually beneficial inside a global economy that remains uneven?

These questions are implied in every project or intervention that Piece undertakes when working in the Southern African handcraft sector.

In response to the challenge, we came up with the idea of a basket competition as a means to help facilitate the shift needed in Tintsaba. The first competition theme was weaving with more than 3 different colours. Whereas traditional baskets were only weaved with a couple of tones, contemporary ones challenged the weavers to break with tradition in an attempt to regenerate them.

There was great excitement and much activity among the weavers. The baskets started to come in. With the creativity flowing and hands exploring new patterns and use of many colours, we needed to ensure that our criteria for judging the winning baskets did not stray too far from what was traditionally considered a good basket. To this end, we consulted with the master weavers who had been

making baskets for many years; these elder women held the knowledge of weaving that was passed down to them by their mothers and grandmothers.

The elders had a method of evaluating beautiful baskets by looking at factors such as the size of the bottom, the size of the coil, the shape of the basket, the size of the stitching 'thread', the pattern, and how the basket came together at the top. These qualities, they told us, were the building blocks of a good basket. When all the baskets were finally submitted we used this knowledge as a framework to judge and choose the top three baskets. To make sure we then laid out all the baskets and asked the master weavers to choose the best. The outcome was the same, confirming that we had understood how to evaluate baskets from a cultural point of view. Our choice was also based on a feeling of what would attract the attention of the international market, suggesting that there was a somewhat universal standard among both makers and market.

Interestingly, over time the competition became the tool for change and innovation by introducing new themes and ideas as and when it was needed. This has allowed the basket to grow and evolve without becoming disconnected from its origins.

The method we had used to judge the competition ultimately became the way we purchased baskets from the weavers. Each basket had a base price and the elements shared by the master weavers carrying an additional value, a scale that determined each basket's ultimate worth. Thus, it created greater attention to detail

and increased awareness in quality control among the weavers. With rewards for creativity and quality came a greater pride in the weaving as well as in baskets as an expression of culture. Over time we also observed an increase in self-confidence and individual creativity which shifted the weavers' paradigm from just making baskets to sell to artistic expression.

An additional value was that this shift seeded a micro-economy as the weavers started valuing their skills. Their entrepreneurial spirit was awakened as seen in the development of a dynamic value chain – from those who cut the sisal, to those who prepared the sisal, to those who dyed the sisal, to those who prepared the weaving threads (photsa), to the weavers themselves. People began to focus on what they were good at rather than trying to be specialists in everything. The weavers, for example, realized that they earned more by weaving and started outsourcing steps like the making of thread. Those who made good quality thread soon had more demand than they could supply so they were able to raise their prices and train others. As this organic process spread so the value chain was strengthened, something that improved the overall quality of the baskets.

The recognition by the market has the power to inspire and drive entrepreneurship, grow a micro-economy, and afford many people a livelihood. Added to this, young people, previously uninterested in the culture of weaving, started to appreciate its potential and sought to participate in the process.

The story of the weavers of Swaziland, the basket competition, is a metaphor about the potential for hands to touch hearts. As the common denominator in a global value chain, the basket became a bridge between vastly different worlds. The basket was a catalyst of a new, global community.

It sustained rural makers by giving them a livelihood, facilitating important lessons about business and entrepreneurship, fostering pride in heritage and identity, igniting individual and group creativity, while also keeping elements of a changing culture alive.

There is a "life" that resulted from inspired creativity and it resonated strongly with hearts in the market, with people who felt enriched and connected by sharing in the beauty of a foreign culture. This is important as the people that make up the market are often disconnected from their own heritage and cultures. The basket and everything that it represents gives a sense of rootedness, being a part of something. In this way the baskets are so much more than products. Instead they become pieces that have a history and context, reflecting the people, hands, and cultures that create them.

When handled in this way such transactions are more than just goods swapped for currency, they become bridges to a very human exchange where each party gains. The maker inspires the market with their creativity and heritage, while the market sustains the maker and, in so doing, ensures the continuation of this cultural practice.

Over many years we have seen customers from many parts of the world being moved by the stories of the people and places where the pieces come from. They feel much more of a connection to the piece or pieces that they are taking home and they go on to share these stories with others. The piece then continues to create sharing and connection, giving cultures a life and audience beyond their geographic reality. The basket weaving illustrates the potential for bridges and exchange, the connection of human beings on a global scale. As Piece, we believe this is the huge potential that is in handcraft.

When we reduce people to producers and pieces to products then we trade in things that have no life. When we are able to communicate the work of hands and the people behind them, their heritage, their stories, and the results of their creativity, then what we offer to the people who are our market has a heartbeat and soul. Such exchanges have the power to connect, educate, enrich, and inspire each person in a global, sustainable, human value chain.

How to create and multiply this reality is a question which we, as Piece, constantly ask ourselves. These are some examples of other instances where this has transpired:

Horn Jewellery

Ankole-Watusi cattle appear in ancient rock paintings and an Egyptian art on pyramid walls. A variety of these called Sanga has spread to Uganda, Kenya, Sudan and other parts of Eastern Africa becoming the base stock of many of the indigenous African populations. They have played a pivotal role in the lives of various African communities providing food, currency, and status.

In Uganda, more than 15 years ago, a skilled craftsman known as Charles started to make shirt buttons for Italian market and basic jewellery such as bracelets and Africa-shaped pendants. A design intervention exploring the cultural significance of the horns while highlighting Charles' innate talent has resulted in a collection of

finely crafted jewellery which reflects the stature of the horns, carries the history of an ancient tradition, utilizes horns that would have been discarded, showcases fine craftsmanship, and provides a better income for the maker who has developed and grown his business.

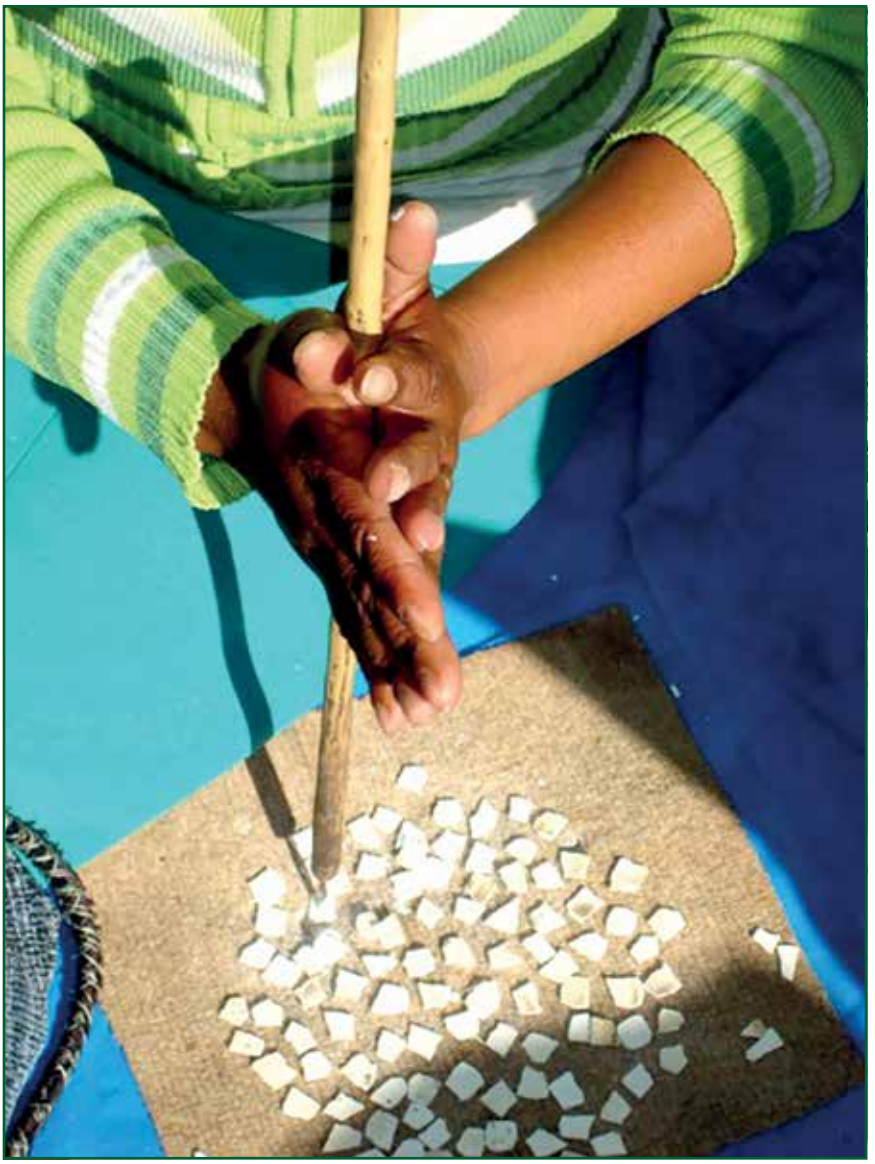
Ostrich Eggshell beads

According to archaeological studies, ostrich eggshell bead making is a 40 000 year-old tradition, rendering it one of the oldest forms of human artistic expression. Bushmen living in Namibia today still make beads in much the same way as their ancestors. For generations, the beads have been fashioned into simple pieces of body adornment and exchanged as gifts by the original hunter-gatherers who roamed southern Africa. Today, however, the making of ostrich eggshell jewellery is an important source of income for several Ju/'hoansi and !Kung communities in Namibia who struggle to sustain some of their ancient way of life.

The shards of ostrich eggs, sourced from commercial ostrich farms, are broken into tiny pieces that are rounded by chipping the edges with a piece of metal or nail clippers. Holes are then drilled using a handmade tool, usually a sharpened piece of metal attached to a long wooden stick. The stick is then rolled between the palms to create a twisting movement that etches into the ostrich eggshell bead. When finished, the beads are strung on a cord and the edges further smoothed using hide or a grinding stone.

Ostrich eggshell jewellery was an important adornment worn during cultural dances, but has mostly been replaced with glass beads in recent years. The opportunity for exchange supports livelihoods and helps keep this ancient craft alive.

Seeking to advance diversity in the world, Piece facilitates the exchange of items which have intrinsic values that are expressed in an authentic, universal language that resonates across very different human worlds.This human exchange is about the translation of old values – from a world where consistency and familiarity were key to identity and a place in the world –into something that is understood in a newer world where values are constantly changed and negotiated, a world that is



often uncertain. The art of weaving and sharing continues to foster communities across time and space; inside of this exchange old and new learn to dwell with each other.

Zimbabwe's Actions towards Climate Resilience and Low Carbon Development

WASHINGTON ZHAKATA,[1] VERONICA NONHLANHLA JAKARASI,[2] AND ELISHA NYIKADZINO MOYO[3]

Zimbabwe is a landlocked sovereign state located in the southern part of Africa. It is a largely semi-arid country with a highly variable climate with rainfall, temperature, and evaporation rates varying considerably both spatially and temporally (seasonally and annually). The country is governed by the Constitution of Zimbabwe which was approved in the referendum of 16 March 2013.

Environmental Policy in Zimbabwe

The Constitution recognises environmental rights and states that every person has a right:

- To an environment that is not harmful to their health or well-being; and
- To protect the environment for the benefit of present and future generations through reasonable legislative and other measures that: -
  - » Prevent pollution and ecological degradation;
  - » Promote conservation; and
  - » Secure ecologically sustainable development and use of natural resources while promoting ecological and social development.

The implementation of the Constitution is supported by sectorial acts, policies and regulations. The sustainable management of natural resources and building resilient communities is the mandate of the Ministry of Environment, Water and

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Climate, Government of Zimbabwe. The Ministry administers over ten Acts of Parliament (MoEWC 2014a) as listed in Table 1:

Table 1: Acts administered by the Ministry of Environment, Water and Climate

Act Name	Original Year of Enactment	Reference
Water Act	1998	Chapter 20:24
Zimbabwe National Water Authority Act	1998	Chapter 20:25
Environmental Management Act	2002	Chapter 20:27
Parks and Wildlife Act	1975	Chapter 20:14
Forest Act	1954	Chapter 19:05
Meteorological Services Act	2004	Chapter 13:21
Rhodes Estate Act	1978	Chapter 20:17
Prevention of Cruelty against Animals Act	1960	Chapter 19:09
Communal Land Forest Produce Act	1989	Chapter 19:04
Trapping of Animals Act	1973	Chapter 20:21
Quelea Control Act	1972	Chapter 19:10
Indemnity Act	1989	Chapter 20:15

Climate Change Response: An Imperative

The Intergovernmental Panel on Climate Change Fifth Assessment Report indicates that the impacts of climate change are projected to impede economic growth and efforts to reduce poverty (IPCC 2014). Preliminary global climate model projections for Zimbabwe up to 2080 predict temperature and increase in evapotranspiration, increased rainfall variability, and frequency of floods and droughts which will exacerbate the existing challenges associated with climate variability that are already being faced by Zimbabwe (MoEWC 2015a Davis and Hirji 2014).

Zimbabwe is also recognised as one of the countries that will be most vulnerable to climate change impacts (Brown *et al.* 2012). The damage to infrastructure as well as loss of livelihoods caused by extreme weather events such as the Cyclone Eline in the year 2000 and the El Ninos in the last decade have demonstrated Zimbabwe's vulnerability and lack of preparedness to climate events. These events have also highlighted the spatial and temporal nature and magnitude of vulnerabilities associated with changing climate which are magnified by pressing socio-economic issues such as extreme poverty, lack of employment and income opportunities, and high levels of rural to urban migration among others.

The 2015/2016 El Nino induced drought is already affecting rural communities, livestock and wildlife although the entire economic impact has not yet been

ascertained (MoENRM 2012; MoEWC 2016). Given the reliance of the majority of Zimbabwe's population on the climate-sensitive sectors and the level of poverty, potential impacts of these changes in climate could be catastrophic to the people, livelihoods, infrastructure, property, and the economy.

National Climate Change Response Strategy

Whilst Zimbabwe has comprehensive acts and policies that govern environment and natural resources management, the policy framework for climate change response in terms of legislations, policies, and regulations are still nascent. A significant development regarding institutionalizing climate policy, which also shows the commitment of the Government of Zimbabwe to address climate change issues, was the creation of a full-fledged Climate Change Management Department in 2013.

Highlights of National Climate Change Response Strategy

The National Climate Change Response Strategy has both short- and long-term adaptation and mitigation strategies with twelve priority strategic objectives that include mainstreaming climate change in all the key sectors of the economy, promote resource-use efficiency, and less carbon intensive pathways and promote sustainable development, management and utilisation of water resources under the changing climate (MoEWC 2014).

The National Climate Policy development process started in 2014 and it is now at its conclusion phase with the final draft ready to be prestented to Cabinet after the Stakeholders' Validation is concluded. The National Climate Policy has a vision, primary goals, and four thematic areas that it addresses. The policy's thematic areas are:

- Weather, Climate Research and Modelling;
- Vulnerability and Adaptation;
- Mitigation and Low Carbon Development Pathways; and
- Enablers or cross-cutting issues.

The enablers and cross-cutting issues address climate change communication, education, training and awareness, institutional arrangements, and climate change governance and gender issues among others. The National Climate Policy seeks to build a climate resilient and low carbon nation. It also seeks to climate proof all the socio-economic development sectors of Zimbabwe and decouple the economic indicators from climate towards sustainable development.

Photo: Minister for Environment, Water and Climate, Hon O.C.Z. Muchinguri and The French Embassy to Zimbabwe Representative, Laurent Godefroy launch the book on 'Children's Thoughts on Climate Change' during the official Launch of the National Climate Response Strategy (National Climate Conference, 19-20 November 2015, Harare Internal Conference Centre).

With the rising need to prepare for and guide climate change management, promote sustainable development, and outline the roles and responsibilities of the relevant stakeholders in the climate change arena, the development of the National Climate Policy became imperative. The Government of Zimbabwe developed a National Climate Change Response Strategy in 2014 to urgently address the impacts of Climate Change and was launched at a high level by the Vice President of Zimbabwe, Hon Emmerson Mnangagwa in November 2015.

In the global climate policy arena, Zimbabwe signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1992. Zimbabwe communicated its Intended Nationally Determined Contributions on 30 September 2015 with the intention of reducing its greenhouse gas emissions by 33 per cent below the projected business as usual energy emissions per capita by 2030 (MoEWC 2015b). Zimbabwe has submitted its Green Climate Fund readiness proposal to access resources to strengthen the National Designated Authority to review and approve project for funding and to also identify National Implementing Entities that can be accredited to access the Green Climate Fund.

Zimbabwe has also sought for support from the Climate Technology Centre for Network to develop a Climate Smart Agriculture Manual and for the Southern African Power Pool to standardize Energy Appliances in the Southern African Region.

Way Forward

Given the nascent stage of climate policy and institutional mechanisms in Zimbabwe, there is a need to work towards long-term guidelines to compel the government, policymakers, private sector, developmental partners, investors, media, researchers, and all players, including the general public to attain an empowered and growing economy in a sustainable way as outlined in the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimASSET), which is the national economic blueprint for development with national priorities and goals.

Mainstreaming of climate resilient development policies across all sectors will be crucial and multi-sectorial responses shall require stronger coordination between government agencies. Effective climate action will require research and innovation as well as effective communication and coordination across key climate sensitive sectors.

The said research and innovation will allow for quality climate data sharing and utilization, especially to develop models for predicting future climate to inform policymaking and strategic actions. The strengthening of systematic observation, early warning systems, and scientific and technical research capacities and capabilities will enhance the country's response to disasters and also enhance the adaptation and resilience of the nation.

To this end, the Ministry of Environment, Water and Climate, Government of Zimbabwe, in collaboration with the Civil Protection Department and United

Nations Development Programme are implementing a comprehensive programme on ***'Supporting Enhanced Climate Action for Low Carbon and Climate Resilient Development Pathway'*** which seeks to scale up rural communities' adaptation and uptake of mitigation initiatives. The Government of Zimbabwe and United Nations Development Programme have collaborated towards Supporting Enhanced Climate Action for Low Carbon and Climate Resilient Development Pathway for 2016/2020. The programme will see the development of the Climate Disaster Management Plans, National Strategy and Action Plan for Sendai Framework, setting up of meteorological equipment in high climate disaster risk areas, Reduced Emissions from Deforestation and Forestry Degradation Strategy formulation, and development of standards for climate resilient infrastructure among others. Climate change education, awareness, and training will play a key role in empowering the communities and general public on the impacts of climate change and how they could best address them or respond in the face of climate shocks. Public participation will assist communities in developing adequate responses to the impacts of climate change. The need for scientific training of technical and managerial personnel on how to respond to the climate change issues will enhance the country's potential to deal with multi-hazard disasters and risks.

Zimbabwe is on the path to evolution in terms of climate policy and continues to develop guiding principles and courses of action that reflect the priority areas and the nature of climate change as a cross-cutting issue. The National Climate Policy, which provides the policy framework for ensuring good climate governance in dealing with climate change issues at local, national, regional, and global levels, is a step in that direction. In addition, a high level committee chaired by the Office of the President and Cabinet has been set up to ensure successful implementation and monitoring of the Nationally Determined Contributions. There is so much at stake not only for the environment but also for humanity; hence, the urgent call to action.

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Rwanda Demonstrating the Impact of Well Managed Climate Finance

ALEX MULISA[1]

Since the recent signing of the historic Paris Agreement on Climate Change in New York, focus has turned on how best to translate global ambition into local action. Without strong action at the country level, we cannot achieve the goal of limiting temperature increases to below two degrees Celsius, let alone the 1.5 degrees demanded by many climate vulnerable nations, including Rwanda.

In Rwanda, the government recognised the need to make the country's development clean, green and climate resilient. As a small, land-locked country with one of the highest population densities in the world, there was simply no other choice.

To begin, the country created a broad and inclusive national vision, known as Vision 2020, which brings all Rwandans into the country's development journey and clearly states the need for climate resilience. This vision was then supported by the integration of Rwanda's Green Growth Strategy into the overarching Economic Development and Poverty Reduction Strategy.

The country also acknowledged that vision statements and policies are only part of the solution. Therefore, Rwanda put in place an institutional framework that responds to both local and contextual needs. Key to this framework is Rwanda's Green Fund – known locally as FONERWA – a USD100 million climate change and environment fund.

Rwanda's Green Fund is a ground-breaking climate resilience investment fund. It is the engine of green growth in Rwanda and serves as an example of what is possible in Africa and around the world. The fund invests in the best public and private projects that have the potential for transformative change that align with Rwanda's commitment to building a strong green economy. The Green Fund also provides expert technical assistance to ensure the success of its investments.

The fund invests in sustainable wealth creation and poverty reduction by providing strategic financing that accelerates Rwanda's transformation to a green economy. Funding proposals are approved based on careful evaluation to ensure

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return on investment and contribution to Rwanda's sustainable development and climate resilience.

The fund is an initiative of the Government of Rwanda to support environment protection and deal with the impact of climate change. It acts as an avenue through which development partners can contribute to Rwanda's green growth ambitions. The fund accepts contributions from both public and private institutions. The Government of Rwanda has demonstrated its commitment to the fund by contributing USD 4 million.

External capitalisation sources include bilateral and multilateral development partner contributions and international environment and climate funds. Some of the fund's key partners include the UK Department of International Development (DfID), the United Nations Development Programme (UNDP), the German Development Bank (KreditanstaltfürWiederaufbau, KfW), the Development Bank of Rwanda (BRD), the Centre for International Development and Training (CIDT), the Climate and Development Knowledge Network (CDKN) and the Global Green Growth Institute (GGGI).

In addition, Rwanda's Green Fund is one of the few that mobilises financial resources from the government's own revenue sources which include:

- Environmental fines and fees
- Environmental Impact Assessment (EIA) fees such as proceeds from forestry and mining funds
- Other environmental revenue and seed financing from domestic stakeholders

Since its establishment, Rwanda's Green Fund has approved 33 investments in climate resilient initiatives and projects. The Green Fund can be accessed by Rwanda's government ministries and agencies, districts, civil society organisations including academic institutions, as well as the private sector. There are four financing priorities through which the fund provides investment:

- Conservation and Sustainable Natural Resources Management
- Research and Development and Technology Transfer and Implementation
- Environment and Climate Change Mainstreaming
- Environmental Impact Assessment Monitoring and Enforcement

The Green Fund team travels across the country to monitor and evaluate funded projects. In the process awareness programmes for citizens on environment protection and climate resilience are carried out.

To date, Green Fund investments have restored more than 3,000 hectares of watersheds and water bodies and have protected more than 4,500 hectares of land against erosion. The fund has also supported tree planting on more than 1,600 hectares across the country.

In terms of green growth, 2,423 households have accessed off-grid energy, and 5,128 people have been supported to cope with effects of climate change. Projects funded by the Green Fund have become a source of employment for more than 20,000 people.

Due to the effectiveness and good management of Rwanda's climate finance, the international Green Climate Fund (GCF) accredited the Ministry of Natural Resources to access project-based climate finance. The GCF accreditation gives Rwanda access to the world's largest climate change adaptation and resilience fund; that is, it allows Rwanda to receive up to USD 50 million to foster the country's transition to a truly green and sustainable economy. It is indeed remarkable Rwanda has chosen to place the environment and conservation at the heart of all it does.

Rwanda's Minister of Natural Resources, Vincent Biruta, clearly expressed the country's green growth ambitions at the 2015 UN Climate Change Conference in Paris:

"By 2050, Rwanda aims to be a developed, climate-resilient and low carbon economy. To achieve this, we need to rewrite the rules of development. Business as usual will not suffice. We must forge a new path by bringing together the best expertise, skills and resources. We must build economies that give dignity to our citizens and also protect the environment."

While Rwanda faces many challenges, and has a long way to go, it is determined to promote sustainability. Rwanda's Green Fund has the vision to respond to Rwanda's current and future financing needs for environment, climate change, and green growth in order to accelerate goals of national sustainable economic development. The work of the fund represents the kind of local action that is needed around the world if we are to respond adequately to climate change and ensure a bright future for generations to come.

More information about Rwanda's Green Fund can be found at www.fonerwa.org.

Children and Climate Change in Zimbabwe Study

PROJECT CONTRIBUTION FROM INSTITUTE OF ENVIRONMENTAL STUDIES, UNIVERSITY OF ZIMBABWE AND UNITED NATIONS CHILDREN'S FUND, ZIMBABWE

Climate change is one of the biggest threats facing mankind today. It has subjected many Zimbabweans, particularly those who lead agriculture-based livelihoods in the rural areas, to a crisis. Farmers, for instance, can no longer predict planting seasons based on past rain patterns. Observing that climate change has an adverse effect on the development of children and that there are knowledge gaps in our understanding of the same, this piece highlights the perspectives of children in an attempt to include their voices in the conversation.

Children are an especially vulnerable group and are at an increased risk of disease, under-nutrition, and water scarcity. Seventy-three per cent of children in Zimbabwe live in rural areas (ZIMSTAT 2012) and are directly affected by low food crop production, food insecurity and hunger which are made worse by frequent droughts, flooding, and unreliable rainfall patterns. Under-nutrition in children is a major public health problem in the country (Food and Nutrition Council 2010).

The Institute of Environmental Studies, University of Zimbabwe, in partnership with the United Nations Children's Fund (UNICEF), Zimbabwe, carried out a study on the vulnerabilities of children to the impacts of climate change and climate variability in Zimbabwe in 2013. This process involved listening to children's special needs and perspectives so that these may be incorporated into national policies, planning, and practices.

The study consisted of a questionnaire survey administered to 1,229 primary and secondary school children in six sites in marginal regions that are prone to drought and flooding, purposively selected because of their vulnerability to climate change. The questionnaire consisted of four sections: background of the children and their vulnerabilities; children's experiences of the impacts of climate change-related issues; children's knowledge of climate change; and children's perceptions, concerns, and recommendations about climate change.

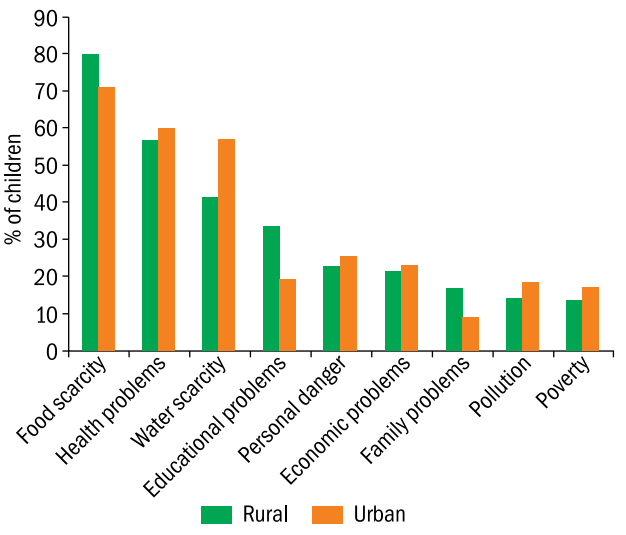
In addition, qualitative data was gathered through group discussions and interviews with local leaders and teachers to find out more about the situation in the surrounding area on climate change awareness and education.

Children during the data collection

Findings of the Study

During the study, it was discovered that the children knew a lot about climate change and were concerned about it. Their major concern regarding climate change was food scarcity; other concerns included water scarcity and health and educational problems (Figure 1).

Figure 1: Children's major concerns which are related to climate change



Children were adversely affected by climate change. Direct impacts of droughts include food shortages, hunger and malnutrition, and poverty.

"This area experiences drought every year and a lot of families do not have food."
"*When l am hungry l feel weak and sleepy even when the teacher is talking."*

Seeing the parents struggle to secure food or acquire money to buy food places emotional and psychological stress on the children.

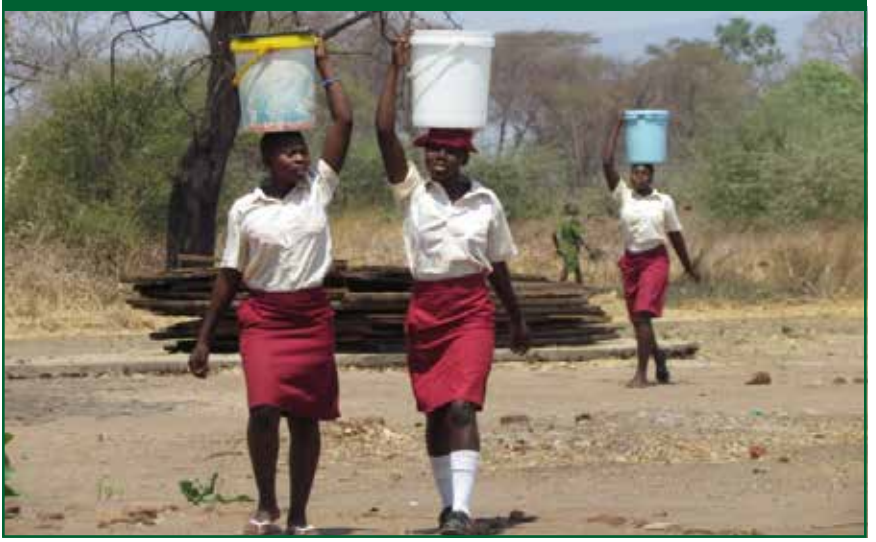
"*When there is no food at home you cannot even talk to parents easily. Sometimes you cannot tell them that you have been sent away from school for non-payment of school fees because of fear of making them angry."*

"*My brother is at home because his money for school and examination fees was used to buy food*."

Another challenge is water scarcity which has led to reduction in productive time as children have to spend time in terms of waiting for collection of water for basic needs of their households.

"*We spend the whole night here waiting to fill our containers. After filling two 20 litre containers there would be no water coming out so we have to wait for up to 20 to 30 minutes for the borehole to recharge 50 litres"*

School girls in Mbire, Zimbabwe, carrying water collected from the school borehole to their homes in the village



The study also found that children are interested in contributing to climate change mitigation and adaptation. Some children already engaged in climate change-related activities, especially in school clubs, and they were keen to be more involved. Involvement of school children in research on climate-related issues,

such as manning the weather stations and collecting rainfall records should be encouraged. Some children participated in the policy process, particularly in the development of Zimbabwe's Climate Change Response Strategy.

Children participating in consultations for Zimbabwe's National Climate Change Response Strategy

The study facilitated the incorporation of children's views and concerns into Zimbabwe's National Climate Change Response Strategy as well as their suggested strategies for action to combat climate change and in the process become more resilient to its negative impacts.

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African Forum and Network on Debt and Development: Natural Resources and Financing Development

FANWELL BOKOSI[1]

The African Forum and Network on Debt and Development (AFRODAD) was created 20 years ago as a pan-African platform and organisation for lobbying and advocating for debt cancellation and addressing other debt-related issues in Africa. It is in this context that AFRODAD addresses the issue of green growth and observes that efficient and effective use of natural resources is the key to expanding the resource base for financing Africa's development initiatives.

Green growth entails using natural resources in a sustainable manner for economic growth. The Africa rising narrative has seen a steady increase in Africa's GDP growth rates. This, to a larger extent, has been due to the commodity boom driven by the high consumption appetite from India and China. Africa continues to rely heavily on the production and export of raw commodities, thus becoming vulnerable to fluctuations in commodity prices. However, it should be noted that natural resources, especially from the extractive sector are finite and will deplete in the long run. Given the reality that most of the top economies in Africa rely heavily on non-renewable commodities like oil and precious stones, the need for Africa to go green through the use of clean technologies and renewable natural resources is now of paramount importance.

The absence of sound policies and procedures governing natural and mineral resources can be a source of economic instability, social conflict, and lasting environmental damage.[2] The lack of transparency in the negotiation of mining contracts and agreements perpetuates corruption. Therefore, income meant for national development ends up benefiting a few elites instead of the masses through education, health, and infrastructure. AFRODAD's work on natural resources governance has revealed that underutilization of the natural resources, mismanagement of proceeds from the natural resources, and skewed trade agreements with developed countries have resulted in Africans not fully

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benefitting from these natural resources. The poor resource governance model that African governments tend to practice often result in poorly negotiated contracts with mining companies or their affiliates. As such, African countries cannot wait to strengthen the capacity of their financial institutions, particularly revenue authorities and the ministries responsible for negotiating mining contracts to minimise these losses. Revenue from the extractive sector should then be utilised towards sustainable sectors of the economy.

Renewable natural resources, such as fisheries and forestry, present a viable source of green growth that could generate export earnings and promote food security. However, in a report titled *Honest Accounts? The true story of Africa's billion dollar losses*, the proposition that the world is aiding Africa is viewed as flawed, conversely stating that Africa is aiding the rest of the world. The Report notes that while Africa receives $30 billion in overseas development aid, the continent is losing $192 billion each year. With 35 coastal states, Africa is one of the world's worst hit regions by illegal fishing. The amount lost through illegal fishing annually for West Africa is at USD 1.3 billion. In finding a lasting solution to this, the Port State Measure Agreement was adopted in 2009 to prevent, deter, and eliminate illegal, unreported and unregulated (IUU) fishing through the implementation of robust port state measures. The Fisheries Transparency Initiative is another international measure to combat illegal fishing. However for these measures to have a meaningful impact, it is advisable that all African countries join the Port State Measures Agreement and the Fisheries Transparency Initiative. There should be a radical transformation to the way in which African renewable natural resources are being utilised in order to attain sustainability. The business as usual approach will result in increased poverty for the majority of African citizens.

Due to illegal logging, Africa is losing $17 billion annually (Curtis Research 2014). Logging with a licence which is illegally acquired or without, exceeding quotas, and dodging taxes dominate this trajectory. The Africa Progress Panel suggests six principles for managing Africa's forests sustainably: greater transparency in commercial logging contracts and disclosure of the beneficial owners of the companies involved; enhanced monitoring and regulation; spreading information about the value of forests; including China (a key player in the logging trade) in the proposed solutions; and strengthening action by consumer countries such as tightening legislation on importers.

The promise of green growth challenges African countries to review their national development plans and strategies to identify opportunities and entry points for green initiatives. National governments should develop and implement concrete policies that govern investments in the extractive industry and also address the problem of illicit financial flows. Strong leadership is an essential enabler of green growth.

The continent would also benefit from pursuing low-carbon development paths, and utilising technologies that use its (Africa's) natural resources optimally and

efficiently. This then calls for use of greater renewable energy commercialisation, such as wind power, solar power, bio-fuels, and related innovations in agriculture. It is important for African countries to raise the level of environmental awareness among the business community, especially the challenges and opportunities to the labour market on the transition to low carbon economy. There is also an urgent need for African countries to invest in green infrastructure, including the use of public assets to build a green economy.

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Book Review

Global Goals, African Realities: Building a Sustainable Future for All

GAURI MARATHE-PANDIT[1]

The Sustainable Development Goals (SDGs) can only succeed if they bring Africa into the mainstream, as Africa's growing population most needs the envisioned change in the post-2015 agenda. Africa Progress Panel (APP) together with a worldwide network of policy analysts and think tanks generate evidence-based policies that can drive the transformation of Africa.[2] The Africa Progress Report (APR) is a leading publication by the APP. As periodic annual publications, the APRs have provided a roadmap for the continent's social, economic, political, and environmental transformation. APR 2015 Special Issue on Sustainable Development Goals: Global Goals, African Realities—Building a Sustainable Future for All is one such example.

The Special Issue synthesizes four consecutive annual reports—*APR 2015: Power, People and Planet: Seizing Africa's Energy and Climate Opportunities*; APR 2014: *Grain Fish and Money: Financing Africa's Green and Blue Revolutions*; APR 2013: *Equity in extractives: Stewarding Africa's National Resources for All*; and APR 2012: *Jobs, Justice, Equity: Seizing Opportunities in times of Global Change.* The Special Issue is a guide for political leaders and civil society as they advance Africa's progress and achievement of SDGs.

APR 2015: Power, People and Planet: Seizing Africa's Energy and Climate Opportunities is a clear message on how Africa can lead the world on climate resilient and low carbon development. This will require political leadership and practical policies. The report articulates current realities, suggests future course of action, and cautions against maintaining the status quo.

At current trends, Africa will attain universal access to electricity by 2080. Non-

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[2] APP consists of ten distinguished persons in business, politics, diplomacy, and civil society whose experience and high regard enables access to the highest echelons of policy formulation and decision making. APP is chaired by Mr. Kofi Annan, former Secretary-General of the United Nations and Nobel Laureate.

targeted energy subsidies are distorting Africa's energy market. Huge amounts of public finance are wasted on insufficient and inequitable subsidies while millions of Africa's poor pay the world's highest energy prices. To make matters worse, the current USD 8 billion a year energy sector investment is inadequate. Unless there is an intervention, this inadequacy will continue to create around USD 55 billion a year financing gap for meeting demand and achieving universal access to electricity until 2030. Almost half of the gap could be covered by increasing sub-Saharan Africa's tax-to-GDP ratio by 1% of GDP. International support in terms of technological transfer and funding is also important. In this light, the $100 billion climate finance pledge by 2020 for developing countries[3] is essential.

APR 2014: Grain Fish and Money: Financing Africa's Green and Blue Revolutions explores how Africa can revolutionize its agriculture and fisheries, which are the livelihood for roughly two-thirds of all Africans. APR 2014 outlines a broad agenda for change in five core principles:

- Sharing the wealth, which is a commitment to inclusive growth, where governments divert some amount from 3% of regional GDP they now devote to energy subsidies to well-designed social protection programmes, including cash transfers to the poor.
- Investing in Africa's unique green revolution, where the African farmer lacks infrastructure, financial systems, scientific innovation, and access to markets.
- Taking the profit out of plunder, where all governments are urged to ratify and implement the 2009 Part State Measures Agreement to tackle illegal, unreported and unregulated fishing as well as publicly disclose commercial logging contracts.
- Closing the twin deficit in infrastructure and inclusive finance, where regional cooperation on energy and transport is vital, in order to achieve economies of scale in infrastructure projects.
- Making tax and finance more fair and transparent, where there is global collective action and all tax exemptions granted are made public.

APR 2013: Equity in extractives: Stewarding Africa's National Resources for All, address natural resources spurred growth whose benefits have not permeated down to the ordinary person. The Report calls for transparency and accountability, distribution of benefits, economic transformation, resource revenue and public spending, and social and environmental sustainability. The report also welcomes the African Peer Review Mechanism as a main framework for monitoring resources and calls for adoption of Africa Mining Vision's framework. It further argues for a global common standard for extractive transparency, thus suggesting acceptance and enforcement of projects by project disclosure standards embodied in the US Dodd-Frank Act and comparable EU legislation to all extractive industry companies.

Further, the Report encourages a multilateral regime for tax transparency and

forging links amongst extractive industries, domestic suppliers, and markets. In the process, value addition and diversification of national economies away from dependence on extraction will be achieved.

APR 2012: Jobs Justice Equity: Seizing Opportunities in times of Global Change links the triangle of jobs, justice, and equity. The Report urges African leaders to tackle the deep, persistent, and enduring inequalities across the continent. APR 2012 was written in the backdrop of the 2011 Arab Awakening, caused by a shared sense of frustration and anger over unresponsive governments and lack of jobs, justice and equity.

The Report urges policy makers to pay attention to smallholder agriculture, where majority of Africans subsist. APR 2012 assures that with the right incentives, institutional reforms, and public spending, the productivity of smallholder agriculture will increase. However climate change is a threat to African agriculture and countering the same calls for international action.

The Report also warns on global trends that will shape Africa's future where an era of higher food prices might drive a land grab in Africa. Governments are to remain vigilant in guarding against speculative activity and thus, the risk of displacement of smallholder farmers.

APR 2012 also highlights the vital role of domestic resource mobilization through taxes and savings in the inclusive and sustainable growth of the African continent. However, it realizes that African leaders need to be able to count on the sustained commitment of the international community and the fulfillment of their many outstanding promises. Further, the continent remains heavily underrepresented in global institutions and constrained by unfair rules.

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The International Journal on Green Growth and Development

The International Journal on Green Growth and Development is an effort to stir a debate around emerging 'green growth' concepts. The publication aims at building knowledge through stakeholder engagement on policy-relevant issues to understand the many facets of green growth and development. It is a step towards a forward-looking knowledge process for new opportunities linked with growth and sustainable development. The journal showcases new research through peer reviewed articles, opinions, and innovative practices.

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