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End of Life Vehicle
Builds up in Harare

Nanotechnology
and the Environment

Children Affected Most
by Climate Change

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Awarm welcome to all our readers to the 8th Issue of the Green Business Gazette, the leading environmental magazine in Zimbabwe. Sustainability is still at the core of our hearts, despite the dynamics being set by the novel Covid-19 pandemic. To fight and survive it, let us all abide by the prescribed WHO Covid-19 guidelines and make a choice to consider vaccination as a protective measure. The Green Business Gazette is proud of all its all stakeholders for the unwavering support in regards to its publications. Special thanks to Konrad-Adenauer-Stiftung for sponsoring the production of Issue 8, in support of raising environmental awareness in Zimbabwe and across the world.

Issue 8 focuses on climate change and children. Change in weather and climatic conditions driven by human activities such as use of fossil fuels for energy and transportation is causing unacceptable detrimental effects on children who have less understanding towards the calamity they face. In this Issue, we look at how climate change is directly affecting children and their diets. Our children's future is at great risk, to turn the situation around and save our children and their future, we need to let go of the linear economy and promote circular economy by changing our behaviour and embracing sustainable development.

Issue 8 also unpacks insights on the use of fossil fuels which seriously contribute towards climate change. For industries to manufacture goods and for power plants to generate electricity, there is need for coal input. Combustion of coal generates heat essential for various purposes, yet in return, carbon dioxide and other toxins are emitted. Catalytic converters are a key ingredient in controlling emissions. When applied on an exhaust system, through chemical reactions, they filter out pollutants by breaking down harmful gases into less harmful compounds and elements. The technology has been around since 1950s, and it is still soldiering on towards attaining sustainability. Nanotechnology is another invention working towards sustainability. Due to its small relative size, it requires less energy and resources to perform a specific task hence, promoting efficiency.

We also look at biodiversity loss emanating from climate change and direct human activities such as urbanization and agriculture. Biodiversity is the variety of life and its forms. It is integral towards life support. Despite its importance being known, certain harsh activities are being run which damage the unique and valuable forms of life. Species such as the African wild dog are now endangered, at the mercy of human activities and their way of life. Balance between ecosystems is fundamental towards the survival and existence of organisms. Biodiversity restoration efforts are being made in order

to turn around the cultivated problem. Human-wildlife conflict is one of the contributing factors towards biodiversity loss. To resolve this challenge, communities are now engaging in natural resources and biodiversity conservation schemes such as Community Based Natural Resources Management (CBNRM).

Furthermore, Issue 8 sheds light on buildings which are responsible for 40% of the end-user energy consumption, 40% of solid waste generation and 12% of fresh water use worldwide. Growing concerns have been raised and advocated on the ecological and carbon foot prints caused by buildings .

The call for action has been answered and technological measures are being applied to make buildings green. Biomimicry and sustainable architecture are growing fields where engineers and designers incorporate green concepts when designing and developing structures. The Eastgate Shopping Mall in Zimbabwe is a unique green building which mimicked a termite mound structure.

The building regulates its internal temperature using sunlight energy obtained from its surrounding environment rather than electricity. Our dear readers, Issue 8 unpacks further interesting facts and insights. Enjoy your reading experience on sustainability with the Green Business Gazette Issue 8.

Tawanda Collins Muzamwese
EDITOR IN CHIEF



THE FUTURE OF KIDS IN TURMOIL AS CLIMATE CHANGE INTENSIFIES EFFECTS ON CHILDREN

by Innocent Nhire



One of the adverse impacts of climate change is how it affects children, and this tends to fly under the radar. Children do not contribute much towards climate change and yet they find themselves being the most vulnerable to its impact. So far, climate change has already devastated the future of children in many aspects. However, it would appear that the worst is still yet to come if projections on climate change are to go by. The impacts of climate change and its related shocks will be passed down from generation to generation, which will leave lasting impacts on the ability of children to survive, grow and flourish. Such a bleak prognosis is rather alarming considering that children are the future of the world.

It has been stated that almost all the 2.5 billion children on planet earth will witness and experience an environment which is 1.5°C warmer, and more than 90 % of children under 16 years will live and experience a 3°C warmer environment. Paradoxically, while today's children have a higher life expectancy, better health and education than their predecessors, the oncoming impacts outweigh the achievements gained.

Rising seas, extreme weather events like tropical storms, floods, droughts and lower yields pose significant food security risks and water stress which are some of the impacts that children have to encounter as a result of climate change.

If adaptation measures fail, consequences can include increasing poverty and hunger, nutritional deficiencies, loss of cultural heritage and an increase in conflict. The climate change impacts on children will vary depending on their environment; where they live and their socio-economic status. However, what is clear is that they will nonetheless experience the impacts of climate change. For example, the ensuing humanitarian crisis after Cyclone Idai in Mozambique, had a direct impact on 1.5 million people of which 50 % were children. Those who were lucky to survive had lost a loved one. Hospitals, schools and homes were lost, which forced children to reside in temporary shelters, posing significant danger and risks towards their health and access to education.

In addition, empirical studies have also shown the adverse impacts of climate change on children globally. A study done by researchers at the University of Vermont on 107,000 children showed that increasing temperatures are an equal or greater threat to child malnutrition in comparison to poor education, inadequate sanitation and poverty. This study, done in 10 countries is one of the largest studies up to date which sought to establish a nexus between climate change and malnutrition in children. The researchers went back to three decades ago in examining the impacts of rainfall and temperature in children's diet diversity. Beyond doubt, the results showed that climate change has invariably caused malnutrition. However, the most important finding was that increased temperatures are already having an observed impact on children in South America, Asia and Africa.

There is more evidence from other studies that increased temperatures are affecting the nutrition of children. Researchers have concentrated on diet diversity, a metric developed by the United Nations to measure micronutrient intake and diet quality. Micronutrients like Vitamin A and D, Zinc, Folic acid and Iron are integral for child development. A lack of micronutrients leads to malnutrition which affects one in three children below the age of five. On the other hand, diversity is measured by counting the number of food groups eaten over a given period of time. On average, children in the study had consumed food from 3.2 food groups (out of 10), including cereal greens, legumes, fish and meat in the last 24 hours. Compared to diet diversity in emerging economies like

China, they have managed to double this average, standing at 6.8 from children below 6 years.

This is more than enough evidence for the need to immediately take action on scaling up adaption interventions. More importantly, there is need for additional resources and support to enable that expanded programs can realise the same objective. This is informed by the fact that in interventions on food assistance which do not factor in the intricacy of food systems and the trickledown effect of climate change across the whole ecosystem will fall short.

The United Nations (UN) stated that 144 million children under the age of five experienced stunted growth in 2019, an of shot of chronic malnutrition. In the same year, around 47 million children under five years also suffered from acute undernutrition or wasting, a condition caused by infection and limited nutrition. On to climate change, the year 2020 was among the warmest years recorded in history and projections are that the world might exhaust its carbon emissions, at the current pace.

For generations, parents have tried to leave behind a better world for their children. Parents have been fighting for rights be it social rights, access to education, free education, women's rights, environmental rights and many aspects that would improve future generations. Today is the time for the older generations to act within the limits of global warming, 1.5°C in line with the Paris Agreement, which allows children to have the future they so much deserve.





End of Life Vehicle

Waste builds up in Harare

by Tawanda Collins Muzamwese



OWNING a car is dream come true for many individuals, as this can improve time management, operational efficiency, protection against the harsh vices of the weather. Mobility is often associated with convenience as well as a sign of affluence in some countries. In developing countries, a large number of vehicles are being imported from countries Japan, United Kingdom, United States and Singapore. Brand new cars are also coming to great utility to those who can afford them. However, when people consider mobility and buying cars, very few consider what will happen to the vehicle, when it eventually reaches the end of its life cycle.

When vehicles reach to the end of their life cycle due to obsolescence, accident wreckages, fire damage or after irreversible wear and tear, there is a challenge in disposing the vehicle waste. The waste from vehicles can include scrap metal, leather, glass, used oil, filters, wood and other vehicle related components. Most garages do not have a clear strategy of how to handle vehicle scrap waste. Harare, has already seen an increase in the amount of scrap body waste in different parts of the city at garages and also in public places. If left unabated, the vehicle scrap problem shall worsen, with a resultant negative effects on environmental quality in the Sunshine City.

In developed countries, there is a clear framework of disposing and recycling used vehicles. This enables recovery of materials as well as extraction of valuable components. The process of recycling used cars and vehicles at the end of their life cycle requires conscious efforts in dealing with heavy metals such as lead which can be potentially neurotoxic to nervous systems of young children. Oils from vehicles can have dioxins, furans and benzofurans, which can bio-accumulate in body fatty tissue around the heart and the liver.

Vehicle manufacturers, governments and organisations in the automobile sector, should collaborate in order to develop a strategy for dealing with the waste generated at the end of the life cycle of vehicles.

Many spots where vehicle scrap can be found include backyard garages, road verges, shopping centres and along some highway roadsides. The issue of quality assurance is very important in vehicle importation policy, to ensure that vehicles which are durable are allowed to get import permission. There are certain vehicles which fold inside towards the body, by merely just leaning on the fender. Such vehicle species are adding onto the burden of vehicle end of life waste as they flake off after even the slightest of impact.

Harare's scrap body challenge is slowly emerging unnoticed and there is an increased call by environmentalists to strengthen control of end of vehicle life cycle management in order to deal with waste. Integrated solid waste management and new measures of dealing with waste area possible ways of dealing with the issue.

Climate Change Worsening – Lets Walk the talk

by Brian Gada





The continued existence of human beings is currently being threatened by several environmental challenges, chief among them is climate change. The world is faced with this bedevilling yet dynamic and turbulent phenomenon which calls for leadership in order to turn the situation around. World leaders have to migrate from routine strategies but rather, they have to adopt effective strategies in a bid to address issues on climate change. This must be coupled with deliberate commitments and attention on proactive actions towards the reduction in greenhouse gas emissions intertwined with capital investments in green technologies and carbon neutral initiatives. It is pertinent to note that there is a need to improve resource efficiency and recycling capacity including the promotion of the circular economy paradigm. Such robust changes call for coordinated International, Regional and National Policy blended with Institutional overhaul and negotiations entangled with coordinated engagements with a sense of urgency. Given the current global status, environmentally conscious and visionary leadership on climate change issues is scarce and remain to be witnessed from the world leaders.

The Intergovernmental Panel on Climate Change (IPCC) has been working and leading the global campaign and advocacy on climate change issues. Although some progress has been realized in terms of challenging countries, especially the industrialized ones to take the leading position in environmental stewardship, much more still needs to be done. Hence, there is a need for regional blocks to be capacitated in order to undertake meaningful negotiations that will convince all parties interested to act. Meaningful negotiations are built upon knowledge and a clear understanding of both climate change issues and the negotiation process. Thus, there is a need for continuous education, capacity building and training of Multilateral Environment Agreements negotiators.

It is important to note that the time to act is now and any further delays have unbearable consequences to the present and future generation and thus it will be a great threat towards sustainability. Current reports from the IPCC indicate that "Climate change is widespread, rapid, and intensifying, and some trends are now irreversible, at least during the present time frame". It was noted that in 2019, atmospheric CO₂ levels were higher than at any time in the last 2 million years. Furthermore, the concentrations of CH₄ were higher than at any time in the last 800,000 years. Such trends are mind-boggling and the alarm bells are sounding loud enough for the world to act now. It will be reasonable enough for both the developed and developing countries to take bold decisions during the scheduled upcoming Conference of Parties number 26 (COP26) to be held in Glasgow on 31st October 2021 to 12th November 2021. These decisions will determine the future of humanity and will play a major role in supporting global, regional and national sustainability.



Africa's Industrialization Prospects, Is a Diversified Model for Industrialization a Better Option for the Continent?

by Innocent Nhire

Industrialization has long been touted as one of the key pillars which can lift the African continent out of poverty. In the quest for Africa's economic development, it is inevitable to run into the industrialization debate, specifically the need for Africa to industrialize. This structural shift has become more than necessary considering that Africa continues to lag behind in economic development and it is a deprived continent. It is not that there have not been industrialization policies and strategies in Africa. They have just not been successful enough over the past decades.

So far, the picture of Africa's industrialization trajectory is rather grim. Globally, the share of manufacturing in total outputs rises with per capita income until the country attains upper middle-income status, then it declines as services become more entrenched. This has happened with other continents but not Africa. Africa is at the bottom of the global value chain (GVC) with its share of a mere 1.9 percent in 2020. The need for industrialization has never been greater. In his editorial remarks, Akinwumi Adesina, the President of African Development Bank Group stated that, "The secret of the wealth of nations is clear: developed nations add value to everything they produce, while poor nations export raw materials. Africa must quit being at the bottom of the global value chains and move to rapidly industrialize, with value addition to everything that it produces"

There is enough evidence to indicate that the traditional approach towards industrialization will miss the mark and

a more pragmatic diversified approach might provide a long-lasting solution to this objective. What is apparent is that Africa's development path will be a much more complex, varied model which will be multi-dimensional in nature. It might be more rational to pursue a diversified pathway which takes much into consideration such as the need for pragmatism, pluralism, where new technologies are best utilized, rather than a radical remake of the manufacturing sector.

This is an acknowledgement that a more diversified model might be the best approach towards the continent attaining its industrialization goals. A number of factors inform this rationalizing. In the first place it is important to understand that Africa has entered a 21st century with a global economy which is substantially different from the previous late industrialisers in Asia. In any case the strong economic growth of the 1990s has slowed down in the new century. The old argument for industrializing through manufacturing by integrating into Global Value Chains (GVC) or adding value through beneficiation of minerals and commodities or by establishing assembly type operations for exports does not quite stick currently. Another argument was to tap into China's growing infrastructure's investment and trade to facilitate industrialization. That appears unlikely and will not materialize as these positions do not factor in the heterogeneity and complexity of Africa's position in GVC. As such instead of following the classic manufacturing

industrialization route, Africa has to take a much more complex set of diversified industrialization paths. Since there is also diversity in endowment, economic and social background, and geographic location, there will be no straight jacketed industrialization strategy

What then is this diversified industrialization model? This model is a new technology driven development of a modern service economy (for countries with large domestic markets) and resource-based industrialization (for those countries rich in minerals). Each country then will have a multipronged approach towards industrialization but these approaches would work within the confined circles as laid down by the model for industrialization. What would link all of them is the necessity for African governments to overcome market failures.

The African Development Bank Group President Adesina stated that; "Diversification is not a goal. It is the outcome of well-planned policies for the structural transformation of economies. No region of the world has moved to industrialized economy status without passing through the transformation of the agricultural sector. This is the formula: agriculture allied with industry, manufacturing and processing capability, equals strong and sustainable economic development and wealth creation throughout the economy".

A hybrid approach to industrialization involves three deliberate industrial policies. In the first instance countries have to develop sectors which are less automated, where the installation of technology has been slow and where Africa still offers labour cost advantages. Studies done by industrial experts on the continent have shown that there are sectors like food processing, paper products, basic metals, textiles and garments which have labour cost advantages in many economies in Africa. These sectors can be promoted through development of local markets and regional trade, which will promote



industrialization. Also, what is important is the need to reduce energy costs while improving its management. A second aspect in diversification is the phenomena of "industry without smoke tracks". This is pathway to industrialization where technology opens new manufacturing avenues for value addition. Sectors to be transformed on global services include horticulture, transport, tourism, business and trade. The last in the diversification matrix is the use of indigenous entrepreneurship in small scale manufacturing, contrary to the so-called digital gap and skills mismatch, the new industrial revolution represents an opportunity for valuable growth. This is evidenced in some African

countries like Rwanda, where there has been increased digitization to improve efficiency in farming, tourism and conservation.

A heterogeneity amongst African countries in terms of context and less likelihood that countries will experience, all these varieties simultaneously means that a strait jacket approach is not an option. Each country on the content will benefit by deliberating and designing its own response so as to create an environment where a multiplicity of industrial futures can thrive. Such an approach can be a realistic path to Africa's industrialization and ultimately economic development.





MEDICAL WASTE On The Rise In The Midst Of The COVID-19 Pandemic

by Tawanda Collins Muzamwese

The Covid-10 pandemic has already wrecked havoc in different parts of the world ever since being discovered in Wuhan, China in December 2019. Global efforts have been placed to fighting the pandemic, promoting vaccination and fostering preventive measures. At the same time, the amount of medical waste has been on the rise during the pandemic.

The pandemic has also resulted in an increased generation of medical waste I many medical institutions as well as that generated from individuals doing self-care. Medical waste is waste from medical facilities and may have the potential for causing re-infection. Medical waste can include used syringes, face masks, vaccines vials, blood vials, bandages and other medical amenities which were used in hospitals and clinics.

Failing to manage medical waste can result in reinfection and high risk to those individuals who are responsible for recycling waste getting in contact with infectious agents. Hospitals are normally fitted with incinerators which burn medical waste to ashes. In contrary to this requirement for incinerators, it is necessary to ensure that there is a greater emphasis on proper management of medical waste including prevention.

Face masks have become a menace especially when they are used. This has resulted on a high number of transmission cases. A more responsible way of doing things is necessary if there is going to be a significant reduction in the rates of covid-19. The irresponsible disposal of medical waste has resulted in some animals such as cattle, eating the masks. At times they have been chokd by the medical face mask.

All medical waste should be treated as hazardous. In order to ensure proper disposal, hospitals and clinics should separate medical waste from municipal solid waste.





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NANOTECHNOLOGY and the Environment



by Bright Beven Chituu

Nanotechnology, also shortened to nanotech, is one of the most promising technologies of the 21st century. The emerging technology of nanotech is seen as the technology that not only holds good promises for a society, but also it is capable of revolutionizing our approaches towards common problems facing the world. By definition, the term nanotechnology refers to science, engineering, and technology conducted at a nanoscale (1 to 100 nanometre), where unique phenomena enable novel applications in a wide range of fields, from chemistry, physics and biology, to medicine, engineering and electronics. A single human hair is about 80,000 nm wide while a red blood cell is approximately 7,000 nm wide, a DNA molecule 2 to 2.5 nm wide, and a water molecule almost 0.3 nm wide.

Nanotechnology is not a completely

new field; however, recent discoveries in this field have advanced so far that warrant examinations are now being considered in regards to their impacts upon the world around us. Nanotechnology has direct beneficial applications for the environment, but like all technologies it is bound to have unintended effects that can adversely impact both the human body and the natural ecosystem. While taking advantage of this new technology for our health, environment and sustainability benefits, science needs to examine its environmental and health implications.

Nanotechnological products, processes and applications are projected to contribute potentially to environmental and climate protection by saving raw materials, energy and water as well as by reducing

greenhouse gases and hazardous waste. Rising prices for raw materials and energy, coupled with the increasing environmental awareness of consumers are responsible for a flood of nano products on the market that promise certain advantages for environmental and climate protection. Nanomaterials exhibit special physical and chemical properties that make them interesting for innovative and environmentally friendly products. The physical and chemical properties of nanomaterials include; increased durability of materials against mechanical stress or weathering, facilitating the increase of product life; reduce cleaning efforts from nanotechnology-based dirt and water-resistant coatings; improved energy efficiency novel insulation materials of buildings and reduce weight and energy saving during transportation.

In the chemical industry sector, nanotechnology is being applied based on its special catalytic properties in order to boost energy and resource efficiency and it is also being used as an alternative for environmentally problematic chemicals. High hopes are being placed in nanotechnologically optimized products and processes for energy production and storage. These are currently in the development phase and are scheduled to contribute significantly to climate protection and solving our energy problems in the near future.

Nowadays, nanotechnology is used to make battery recycling economically attractive. Countless batteries still contain heavy metals such as mercury, lead, cadmium, and nickel which can pollute the environment and pose a potential threat to human health if they are not disposed-off properly. Not only do the billions upon billions of batteries in landfills pose an environmental problem, they are also a complete waste of a potential and affordable raw material if recycled.

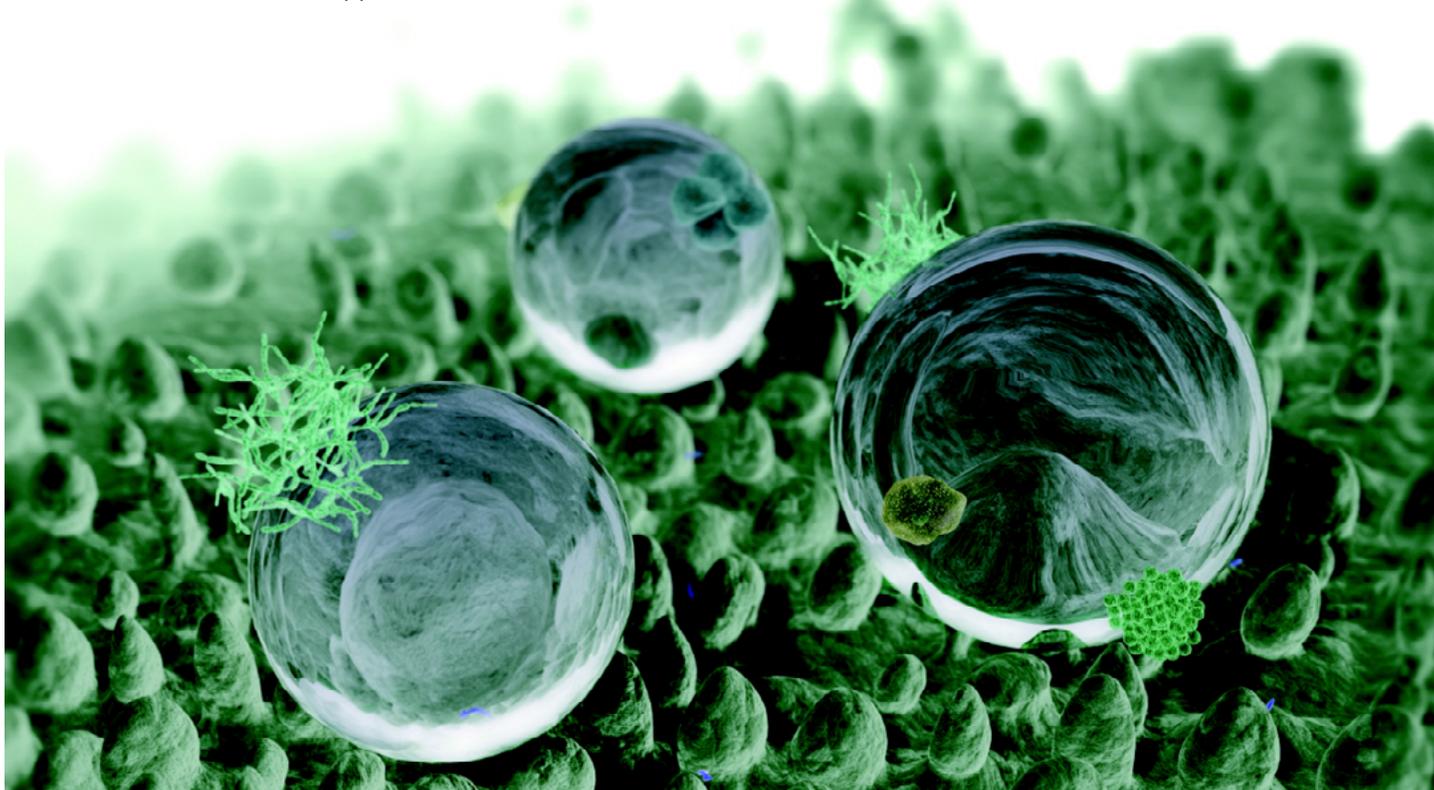
Air pollution is a potential area where nanotechnology has great promising solutions. Filtration practices similar to the water purification approaches could be used in buildings to purify indoor air volumes. Nano-filters can be applied

on automobile tailpipes and factory smokestacks to filter out contaminants and prevent them from entering the atmosphere. In addition, nano-sensors could be developed to detect toxic gas leaks at extremely low concentrations.

The potential impact areas for nanotechnology in water applications are classified into treatment and remediation, sensing and detection, pollution prevention and the improvement of desalination technologies. Remediation of contaminated groundwater using nano-particles containing zero-valent iron is one of the most prominent examples of a rapidly emerging technology with considerable potential benefits. Nanotechnology-based water purification devices have the potential to transform the field of desalination through using the ion concentration polarization phenomenon. Further on, scientists are working on a nanotechnology solution for radioactive waste clean-up, precisely the use of nanofibers as absorbents for the removal of radioactive ions from water. Researchers have also reported that the unique structural properties of titanate nano-tubes and nano-fibres make them superior materials for the removal of radioactive caesium and iodine ions in water.

Artificial photosynthesis using solar energy to split water in order generate hydrogen and oxygen can offer a clean and portable source of energy supply as durable as the sunlight. It takes about 2.5 volts to break a single water molecule down into oxygen along with negatively charged electrons and positively charged protons. It is the extraction and separation of these oppositely charged electrons and protons from water molecules that provide electric power. Working on the nanoscale, researchers have shown that an inexpensive and environmentally gentle inorganic light harvesting nanocrystal array can be combined with a low-cost electro-catalyst that contains abundant elements to fabricate an inexpensive and stable system for photo-electrochemical hydrogen production.

Nanotechnology has a huge potential for providing advanced solutions towards a wide range of environmental issues. These include better methods for reducing pollution, water treatment, environmental sensing, remediation, and making alternative energy sources more cost-effective. The unique properties of engineered nano-materials allow these new technologies to meet the global environmental challenges in a sustainable way.



African Airlines **Kenya Airways** Begins Initiatives to Develop Low Emitting Electric Vertical Aircraft Models

by Wallace Mawire



Kenya Airways and its partners have started initiatives to establish the co-creation of a foundation of concepts and procedures to safely scale electric vertical aircraft (EVA) throughout the country in the coming years. Eve Urban Air Mobility Solutions ("Eve") signed a Memorandum of Understanding (MoU) with Kenya Airways PLC, the flag carrier of Kenya, through its fully owned subsidiary Fahari Aviation. The collaboration aims to develop operational models for the wide accessibility of Urban Air Mobility (UAM) to support Fahari Aviation's key markets.

It is reported that Eve will support Fahari Aviation, the Unmanned Aircraft Systems (UAS) division of Kenya Airways that promotes safe and secure UAS usage in the region, in establishing its UAM network and collaborate on the required Urban Air Traffic Management (UATM) procedures and UAM operating environment. The partnership is reported that it will also allow Fahari Aviation to support Eve's aircraft and product development process which will help guide the integration of UAM with Kenya Airways' overall operations. Eve's fully electric aircraft is designed to be accessible to all while being a community-friendly aircraft with a low noise signature and no emissions. It aims to drastically cut road travel time. Ideally, it is suited as a

UAM aircraft bringing all traditional aviation travelers closer to their final destination efficiently and comfortably.

"We are thrilled to partner with Kenya Airways to provide new forms of air mobility throughout the region for both people and goods. The creation of disruptive and widely accessible Urban Air Mobility solutions will help democratize mobility by making it more accessible, affordable and give communities more options. This partnership will foster long-term mobility strategies throughout the country and region.

With our aircraft and aerospace services backing and Kenya Airways' innovative approach to air mobility, we are enthusiastic about opening this region to more sustainable and community-friendly air access for all," said Andre Stein, President and CEO of Eve.

"Partnerships are vital in mapping out the future of our airline, something which the global crisis has reinforced. Innovation is a critical element of our long-term sustainability. Fahari Aviation is at the forefront of exploring advanced technologies, with a key focus in aviation, starting with drone technology. With this partnership, we look to develop innovative air mobility solutions for our clients in Kenya and throughout the region," stated Allan Kilavuka, Group Managing Director and CEO of Kenya Airways.

The partnership is expected to deliver a robust strategy to provide Fahari Aviation's passengers with a sustainable, accessible, and affordable transportation option. It is estimated that using UAM from the airport to downtown, EVA can

reduce conventional road trips by up to 90% turning an hour and a half ride into a 6-minute flight.

Kenya Airways, a member of the SkyTeam Alliance, is a leading African airline flying to 41 destinations worldwide, 34 of which are in Africa, and carries over four million passengers annually. In 2020 KQ was named Africa's Leading Airline by the World Travel Awards. It continues to modernize its fleet, with its 32 aircraft being some of the youngest in Africa. The on-board service is renowned, and the lie-flat business class seat on the wide-body aircraft is consistently voted among the world's top 10. Kenya Airways takes pride in being at the forefront of connecting Africa to the World and the World to Africa through its hub at the new ultra-modern Terminal 1A at the Jomo Kenyatta International Airport in Nairobi.

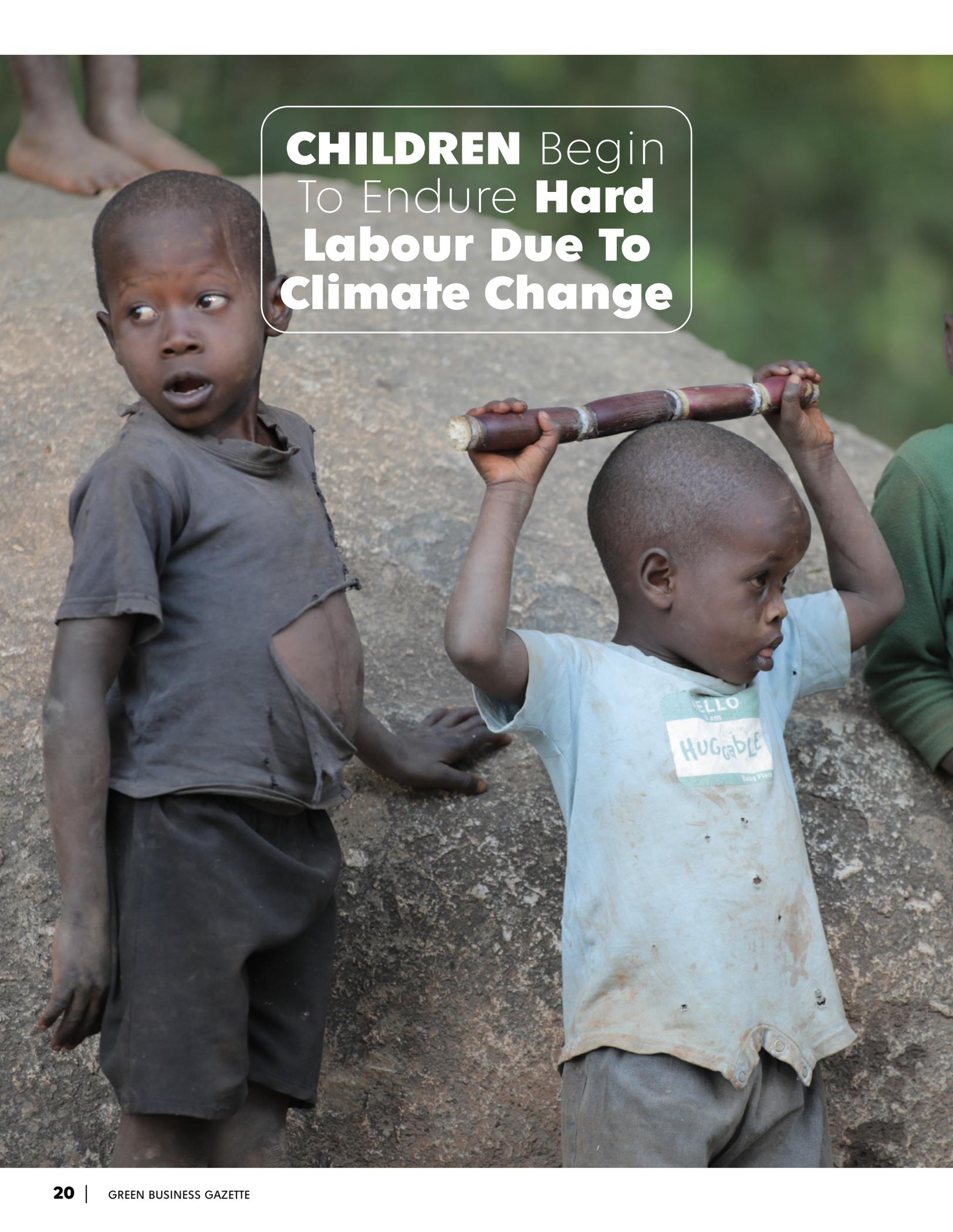
Fahari Aviation is a wholly-owned subsidiary of Kenya Airways PLC that will lead the application of Emerging Aviation technology in the region and continent. Fahari's initial focus will be the application of drone technology in training, operations, and traffic management with a view to growing

into maintenance distribution and design, and production of drones.

Eve is a new independent company founded by Embraer dedicated to accelerating the Urban Air Mobility (UAM) ecosystem. Benefitting from a start-up mindset, backed by Embraer's more than 50-year history of aerospace expertise, and with a singular focus, Eve is taking a holistic approach to progressing the UAM ecosystem with an advanced electric vertical take-off and landing vehicle (eVTOL) project, comprehensive global services and support network, and a unique air traffic management solution. Eve is the first company to graduate from EmbraerX.

A global aerospace company headquartered in Brazil, EmbraerX has businesses in Commercial and Executive Aviation, Defence and Security and Agricultural Aviation. The company designs, develops, manufactures, and markets aircraft and systems, providing services and support to its customers.





CHILDREN Begin
To Endure **Hard
Labour Due To
Climate Change**



by Tawanda Collins Muzamwe

Deep in the valleys and mountains of Mahwemasimike, in Honde Valley, the brunt of climate change is reaching a fever pitch level. Jokoniya (not his real name) is a young eight year old child who has started brick moulding, in order to supplement household income. The valley precincts are located very close to neighbouring Mozambique, such that some people travel back and forth to look for livelihood in both countries.

Jokoniya has had to start fending for the family through brick moulding due to the fact that it is not possible to do effective rain-fed agriculture due to climate change and shift in weather patterns and also his parents are not staying with him. He must take care of himself and his siblings.

Children bear the brunt of climate change especially if their parents are deceased or abandon them due to domestic disputes. International sustainability frameworks aim to protect young children from strenuous work. The current patterns of climate change put such children in a place of hard rock as they try to establish livelihoods options in the age of climate change.

Crops normally grown in the area include maize, yams, sugarcane, sugar beans. Bananas and avocados are also available in the area. Stronger support mechanisms for climate adaptation, climate smart agriculture are necessary in order to ensure that there is optimum use of soil moisture and there is increased output of produce and revenue.

For young children like Jokoniya, climate change has brought a situation needing drastic action of work activities, some which are not agro-based. The Green Business Gazette in the latest issue of "Climate Change and Children" urges families to prioritise education of children and climate mitigation and adaptation strategies which promote sustainable socio-economic development.

As the world darts towards a 2 degrees celsius increased mark, it is becoming clear that more young children will have to take a route which puts them at risk of hard labour.

Failing to address the issue of climate change results in children venturing into activities such as brick moulding and illegal mining, just to ensure that they get resources for survival.

Catalytic Converters and Sustainability



Bright Beven Chituu

The use of fossil fuels in the transport sector has increased the greenhouse gas (GHG) emissions during the last decades. This is an issue of great concern towards global warming and climate change in the world. Fossil fuels used for transportation such as petrol or diesel release exhaust gases composed by carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), carbon monoxide (CO) and hydrofluorocarbons (HFCs).

These pollutants have adverse and irreversible impacts on both human health and the environment. Emissions from diesel engines compared to petrol engines are more hazardous and so it is a matter of major public concern. The harmful effects of fossil fuel emissions on the environment and human health have led to a number of scientific researches and inventions

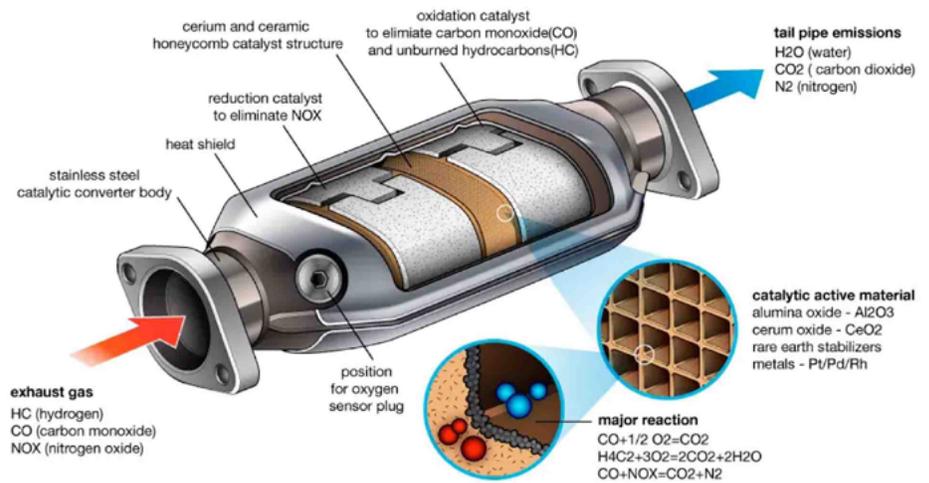
in order to reduce these vehicular exhaust emissions generated from the internal combustion engines. A Catalytic Converter is the most efficient device utilized in the exhaust system of a combustion engine in order to reduce exhaust emissions generated from combustion chemical reactions.

The issue of air pollution had been recognized as early as 1306 when King Edward I of England introduced a declaration prohibiting craftsmen from using sea-coal in their furnaces in an effort to improve air quality. During that time up until the invention of an automobile, the major contributor of air pollution was the burning of coal. A year after the introduction of the Ford Model T in 1908, scientists gave attention to the issue of noxious gases produced as a by-product of the internal combustion engine.

A Catalytic Converter is a large metallic box having a dense honeycomb structure inside it. It was designed by Eugene Houdry, a French mechanical engineer and expert in catalytic oil refining around 1950. After the results of early studies of smog done in Los Angeles were published, Eugene Houdry became concerned about the toll smokestack and automobile exhaust impacts on air quality and founded a company, Oxy-Catalyst.

Eugene Houdry first developed catalytic converters for smoke stacks called cats for short. Then he later developed catalytic converters for warehouse fork lifts that used low grade non-lead petrol. Then in the mid-1950s he began his research to develop catalytic converters for petrol engines used on cars.

The biggest issue with combustion engines is that they tend to incompletely burn the fuel applied in them. Complete combustion is when the maximum amount of energy is being achieved, by the fuel being burnt, and it has two by-products; carbon dioxide and water. Incomplete combustion is when the maximum amount of energy is not achieved by the reacted fuel especially when there is too much fuel in the combustion mixture and insufficient relative oxygen present. To combat the creation of carbon monoxide during combustion, the catalytic converter was implemented.



The catalytic converter has two chambers namely, the reduction and oxidation chambers. The first chamber consists of Platinum and Rhodium coated ceramic honeycomb structures, which reduces the nitrous oxide (NOx) emissions by acting as a reduction catalyst. Exhaust gasses flow through the other chamber formed by Platinum and Palladium, which acts as an oxidizing catalyst. In this chamber, disintegration of hydrocarbons (HC) and the formation of carbon dioxide (CO₂) takes place with the extra oxygen (O₂) in the presence of catalysts. Scientific studies discovered that catalytic converters decrease hydrocarbons by 87%, carbon monoxide by 85%, and nitrous oxide by 62% depending on the life cycle of a vehicle. Apart from removing noxious chemicals and pollution from car emissions as a result of fossil fuel combustion, the catalytic converter helps the overall engine efficiency.

A growing concern regarding the effects of vehicle exhaust emissions on human health and natural ecosystems is causing serious consideration to be

given towards requiring all new vehicles to have catalytic converters fitted in their exhausts. The development of sustainable catalytic converters still remains a critical issue due to the stringent exhaust emission regulations. While catalytic conversion of gaseous small molecules in tailpipe emissions currently draws significant public attention, catalytic gas conversion has been an important industrial process for years. Taking advantage of the catalytic converters' invention, some companies have been converting atmospheric nitrogen gas into other nitrogen-rich compounds used for fertilizers, cleaners, refrigerants, explosives and much more. At the turn of the 20th century, other industries and manufacturing companies used an extremely energy-intensive non-catalytic process for converting nitrogen and oxygen gases to nitric acid, which eventually was replaced by an alternative catalytic process.

Catalytic converters were invented to decrease pollution. However, catalytic converters only reduce harmful gasses. They do not completely remove toxins from the combustion engine emissions. Also, catalytic converters work best in high temperatures. The main by-product of a catalytic converter process is carbon dioxide which has recently been found to be one of the biggest contributors to global warming and climate change.

The catalytic converter fulfilled its purpose in greatly reducing the levels of smog and air pollution generated in car-dense environments, and as a result, it will go down in history as one of the most effective automotive advancements of all time. With that being said, the modern world cannot rely on the catalytic converter as a complete solution for the negative impacts of internal combustion engines on our environment. Hence, better and more sustainable solutions are needed.



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ENERGY EFFICIENCY IN BUILDINGS

Tendai Kaneta

Buildings are part of the major causes of environmental problems and are responsible for one-third of global greenhouse gas emissions. They account for 40% of the end-user energy consumption, 40% of solid waste generation and 12% of fresh water use worldwide. Hence, the need for green buildings can be a good step in mitigating climate change by reducing the energy used in buildings and securing a more sustainable future urgently.

A green building is a construction output with a lifetime of operation which assures the possible sustainable environment while representing the most efficient and least disruptive use of land, water, energy and other resources.

Green buildings use environmentally responsible materials and they are resource efficient. As part of the inhabitants of green buildings, humans have come out with ways to mimic the natural systems in our environment. This is called Biomimicry.

Termites have been around since antiquity. Besides causing damage, they have always been a sign of hard work. Eastgate Shopping Mall, Zimbabwe is a unique complex not only in Zimbabwe but also internationally. The building heats and cools through natural means and it has proved to be highly effectively. It uses energy than similar buildings in the country. It was modelled on the self-cooling termite mounds which cool and heat using energy from the surrounding natural environment. This was one of the first and significant biomimicry infrastructure design to be used in the world.

The mounds are naturally warmer particularly at night, so the warm air rises through the chimneys while pulling cooler air from underneath the chimneys into the building which creates the natural cooling effect.

So, the cool air is trapped in the concrete blocks so that it can be transferred into the building during a warmer day, the concrete acts as a thermal store. Eastgate Shopping Mall, Zimbabwe also mimicked the cactus plant with its large surface of thorns, the shopping mall has plants on its walls to cool down its inside temperatures as well.

Surprisingly, the designer considered our Zimbabwe culture by incorporating the Great Zimbabwe quality with concrete and went on to use traditional stool making designs. The designer made sure that most of the materials needed were obtained locally in order to reduce transportation costs which would affect the environment negatively through automobile emissions. Eastgate Shopping Mall was designed to be an effective green building, thanks to the Architect Mick Pearce.

Green buildings do not consider energy efficiency only, they also consider water usage within them. Buildings consume more than 20% of the world's available water and this is too high for our goal of promoting water efficiency. With the aim to improve water efficiency, buildings are now incorporating technologies in order to reduce water usage through following shower-heads restrictions, utilizing dual-flash valves on water closets and many more. Furthermore, the use of alternative water sources to reduce domestic water usage is advised. This gives a chance for the grey water (waste water that comes out of households) to be reused again instead of using potable water.

It is of great importance that communities start building with a green initiative and approach so that we live in a healthy environment and also preserve it for the future generations. It starts with you!



Opportunities from the Sustainable Development Goals (SDGs)

Simba Machisa

Today our world is faced with immense challenges on sustainability such as natural resources depletion, climate change, land degradation, fresh water scarcity and loss of biodiversity. Sustainable Development Goals (SDGs) are there to achieve sustainable development in 3 areas; Economic, Social and the Environment in order to address the unfinished business started by the Millennium Development Goals (MDGs).

In September 2015, 193 member States of the United Nations met in New York to adopt 17 new SDGs with 169 associated targets. Sustainable Development Goals set out quantitative objectives and priorities across the social, economic, and environmental dimensions of sustainable development, all to be achieved by the year 2030. The SDGs call for worldwide action among:

- Governments
- Business
- Civil society

With an aim of ending poverty and creating a life of dignity and opportunities for all.

Basic Structure of Impact Opportunity.

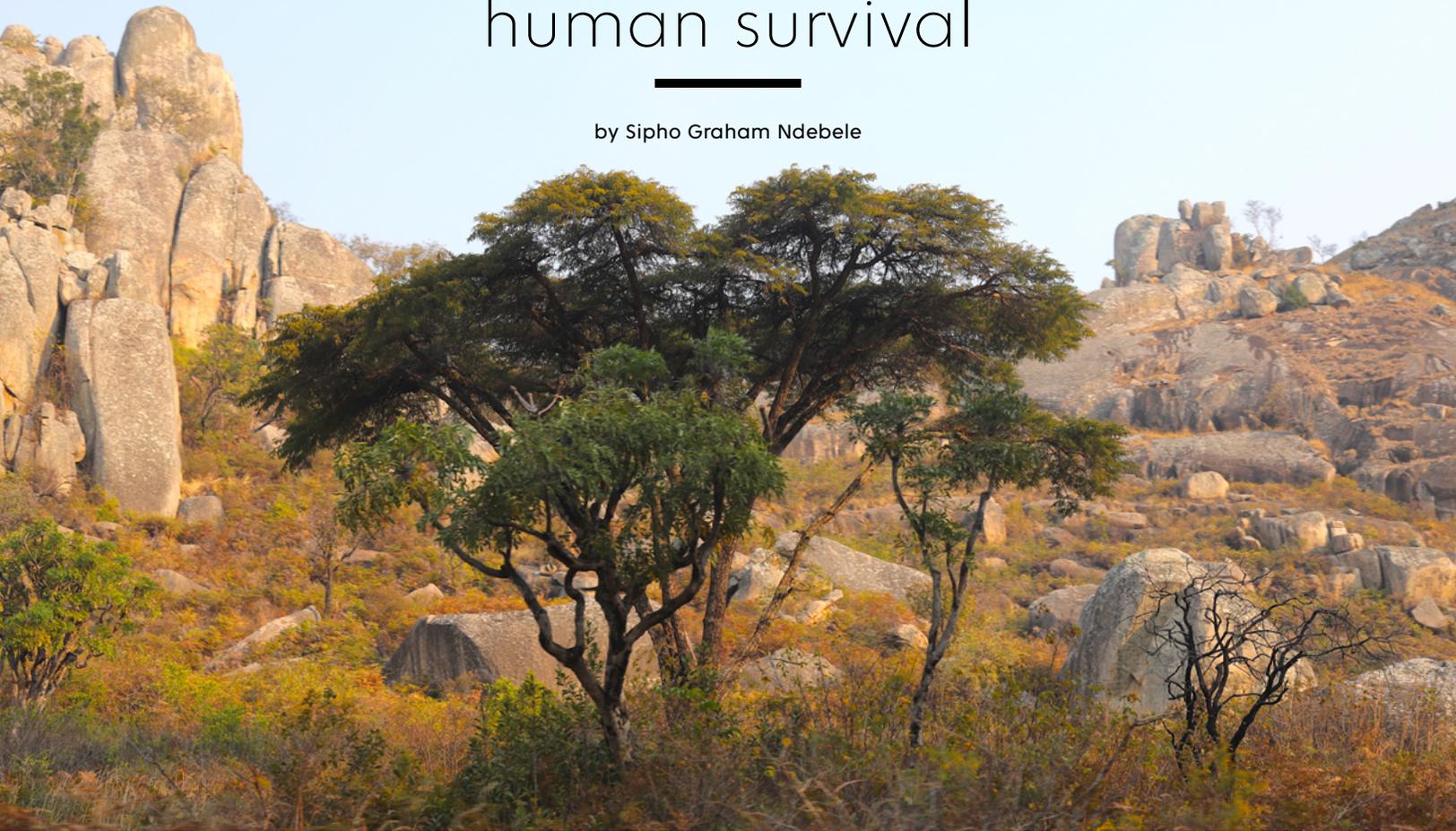
1. What is the problem you want to solve?
2. How big is the problem?
3. Why does the problem exist?
4. How do you know that this is a problem?

Start-ups, entrepreneurs and small-medium-enterprises, time is not on our side, let us harness these GOLDEN EGGS and end poverty in our countries. According to Peter Drucker, "Behind every problem there are hidden opportunities". In light to a report by the Business and Sustainable Development Commission (2017), by 2030 a total of US \$12 trillion of revenue and business savings could be generated by SDGs across four main sectors including: food and agriculture, energy, health and wellbeing, and sustainable cities.



Biodiversity Restoration key to human survival

by Sipho Graham Ndebele



Our existence on earth, is sustained through resources, obtained from the environment. We are part of an ecosystem that has unique biodiversity. An ecosystem is a community of living and non-living organisms that live and interact with each other in a specific environment.

Biodiversity is the variety of life on the earth. The World Wildlife Fund report entitled; "Appetite for Destruction", found out that meat-based diets are destroying about 60 percent of biodiversity through growing animal feed. Giraffes, giant pandas, snow leopards, cheetahs and jaguars are said they could cease to exist over time. "Without biodiversity, there is no future for humanity", well said by Professor David Macdonald at the Oxford University.

Biodiversity is made up of several levels which

include genes, individual species, communities and an ecosystem. Our forests, farmlands, lakes and rivers are some of our ecosystems. Human activities such as pollution and waste are destroying biodiversity, contributing towards climate change and most importantly, stealing the future of our children. Biodiversity restoration aims to recreate, initialise or accelerate the recovery of an ecosystem that has been disturbed.

Agriculture consumes about 40 percent of land on earth. Farmlands provide fruits, vegetables and meat. For plants and animals to be grown and bred, harmful fertilizers and pesticides are used, vast land and vegetation is cleared and bulk water is extracted for irrigation. Clearing forests and land disturbs habitats for various species such as birds. These activities are causing biodiversity loss and endangering certain species.

The Food and Agriculture Organisation (FAO) defines conservation agriculture as a practice that promotes less soil disturbance, permanent soil cover and diversification of plants. Soil cover, no-tillage, inter-cropping, using manure and biopesticides improves biodiversity conservation by preventing disturbance of micro-organisms integrity in the soil, the spread of pest diseases associated with mono-cropping and improving carbon sequestration, combating biodiversity loss and climate change at large.

Forest and mountain habitats about 80 percent of the world's amphibians and most birds and mammals. They also provide firewood, medicine and wild food. Through agriculture, invasive pests and diseases, use of firewood, logging timber, and wildfires, our biodiversity is being lost. Clearing land to establish farms and urban areas disturbs soil cover, resulting in soil erosion and siltation leading to biodiversity loss.

Agroforestry, afforestation and reforestation are techniques which can regain lost biodiversity. Re-vegetated plant species control siltation and water quality, most importantly, they restore biodiversity as the vegetation flourishes. Sustainable Development Goal Number 12; Responsible Consumption and Production can also be considered in order to restore biodiversity. Through monitoring our food systems, waste can be avoided in the value chain hence, conserving resources and biodiversity. Urban farming and climate smart agriculture are some methods that are more sustainable compared to conventional agriculture.

Our freshwater and marine ecosystems' biodiversity is being degraded from overfishing due to unreasonable consumption and production and high quantities of water extraction for irrigation, industrial and residential use. These factors disturb the conditions ideal for the aquatic life which threaten their existence. Approximately, 160 billion pounds, is the total amount of fish caught per year, of which about 40 percent of it is wasted through teffovers and industrial processes.





Seagrass is a hidden climate champion; it can capture carbon (CO₂) about 35 times faster than tropical rainforests. To conserve seagrass and other marine life forms, effluent must be treated before discharge, solid waste must be handled in a holistic manner including other factors that contribute to water pollution such as mining and agriculture. If water pollution is controlled, biodiversity loss will be prevented which will result in recovery of aquatic life.

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods. These ecosystems provide us with recreational value, flood abatement, erosion control, habitat enhancement and most importantly, water purification. Nowadays we see construction being done on wetlands which degrades its functions and its dependent species. Other factors deteriorating wetlands are fire, overgrazing and pollution for instance.

Wetlands cover about 3 percent of the world's land, yet they store about one-third of all the carbon in their soil. This ability makes wetlands a carbon sink, which helps to control climate change. To conserve our wetlands and restore its biodiversity, preservation can be used to protect undisturbed wetlands through national parks and recreational centres.



Climate Change Wadzanai D. Manyame affecting children diets

A threat to food security and malnutrition is ranked top under the notion of climate change and children. Climate change is posing a devastating threat on food security especially in countries that rely on rain fed agriculture such as Zimbabwe. A shortage in adequate food supply is in turn affecting the diet of children, especially those under five years old. The mostly affected populations are the rural folks and those living in poverty. According to the United Nations, in 2019 approximately 144 million children under the age of 5 were affected by stunting as a result of chronic

malnutrition due to lack of adequate and nutritious food. In November 2019, farmers in Zimbabwe received only 55% of normal rainfall and the country was hit by a drought. One said to instigate what can be recorded as the decade's worst hunger crisis. The country entered phase 3 food crisis obviously coupled by the increase in staple food price by up to 31%, exacerbated by shortage of supplies. The World Food Programme made efforts to assist close to 7.7 million people that had been plunged into hunger across the country. What about the children's diet, health and wellbeing? If food aid enough to provide a

balanced diet and restore good health? Statistics show that 1 in 3 children in Zimbabwe under the age of 5, are suffering from malnutrition, while 93% of children between 6 months and 2 years of age are not consuming the minimum acceptable diet. There is a noticeable rise in incidence of deadly diseases linked to micro-nutrient deficiency such as pellagra and these health implications are directly and indirectly linked to climate change. A phenomenon behind the increased frequency of droughts and other harsh weather conditions that affect agriculture and food security.

More than 600 cases of pellagra were recorded 5 months after Cyclone Idai hit Mozambique and Zimbabwe. It was the first time in years that cases of pellagra had been recorded. A cause for concern as 715 300 hectares of crops were swept away and collectively more than 3 000 children under the age of 5 were diagnosed with life threatening severe acute malnutrition. Climate change induced disasters such as tropical cyclones, floods and veld fires have the ability to mercilessly sweep off entire farmlands, kill livestock, destroy homes, supermarkets, grain stores and any infrastructure available that is not resilient to the applied pressure. These disasters can leave populations stranded, homeless, jobless, abandoned with no food to eat, water to drink

and anywhere to run to for assistance.

Children are affected the most in the face of climate change induced disasters. They have weak immune systems and consistently require adequate food to grow healthy and be fully developed. Unfortunately for some, this is all a mirage. Their lives will either take one of these two scenarios. Scenario A; a child suffers malnutrition and becomes more susceptible to preventable diseases such as measles. Scenario B: a child survives as a malnourished child but with severely impacted development of vital organs and body functions which will in turn lead to health complications. Either way there is no saving or escaping and this situation will be more dire if climate change goes unabated.



African Countries Urged to Formulate Energy Codes for The Building Sector to Reduce Emissions

Wallace Mawire

African countries have been urged to formulate energy codes for the building sector to enable reduction of emissions. The call has been made as part of Africa's roadmap towards transforming its building and construction sector. According to the Global Alliance for Buildings and Construction, the large housing backlog and growing demand in Africa can be viewed as both a huge challenge and a tremendous opportunity to expand economic activities and create millions of jobs. It is also reported that, it could be an opportunity to transform the sector into a resource efficient, resilient and low emissions sector.

According to Jonathan Duwyn, Programme Officer, Buildings and Construction Cities Unit, Energy and Climate Branch, Economy Division at the United Nations Environment Programme (UNEP), in 2018, the African buildings sector accounted for 61% of the final energy use and 32% of the energy related carbon dioxide (CO₂) emissions, excluding emissions from the manufacturing building materials. It is reported that the Paris Agreement Goals cannot be achieved without decarbonizing buildings. It is also added that most countries in Africa do not have energy codes for buildings. Building energy codes are reported to be a key instrument to reduce emissions from the buildings sector.

Jonathan Duwyn says that to date, most African countries, at least 68% of them mention buildings, although most National Development Commitments (NDCs) still do not include explicit actions to address buildings sector energy use and emissions. He says that the Africa's roadmap aims to support governments in their NDC development by providing an illustration of the pathway towards a zero-emission, efficient and resilient building stock. He adds on that, half of the buildings standing in 2060 have not yet been built. Jonathan Duwyn further says that, the current housing backlog in the African continent accounts for at least 51 million units, with large variations across countries. It is added that in Africa, rapid population growth and urbanization is increasing the demand for new buildings and infrastructure. The floor area in Africa is expected to double between now and 2050, over 90% of it will be in the residential sector.



In the West African Economic and Monetary Union (WAEMU) region, population is projected to increase by 100 million over the next two decades and will require an additional 800 000 housing units each year. It is also reported that only Morocco and Tunisia have mandatory building codes in place that covers the entire building sector. Ghana and Nigeria have codes that covers part of the sector, Egypt and South Africa have voluntary codes, Botswana, Burundi, Cameroon, Cote D'Ivoire, Ghana, the Gambia, Kenya, Senegal, Tanzania and Uganda are developing building codes standards. The remaining 38 countries in Africa are reported to yet implement building energy codes.

It is added that most African countries have referenced buildings or construction in their NDCs, but most of them lack a commitment to the net zero and concrete targets and measures. According to the World Bank, the total investment potential for clean energy based on existing national climate commitments in Côte d'Ivoire, Kenya, Nigeria, and South Africa is nearly \$783 billion, with buildings and transportation accounting for about \$652 billion and renewable energy generation having about \$123

billion. Jonathan Duwyn outlines key actions which he says that they need to be put in place such as developing local roadmaps, developing and implementing mandatory building energy codes, avoiding need for space cooling, having governments lead by example on public procurement and reducing embodied carbon.

Policy makers are urged to develop performance-based building codes and consider including into NDCs elements such as passive design to reduce cooling demand, resilience, life cycle approaches and low-carbon materials.

For designers such as planners, architects and engineers it is reported that the key to achieving efficient, low-carbon, cost-effective housing lies in the design stage, which in turn can be most influenced by building codes. It is also added that national NDC buildings and construction roadmaps should be modelled on Global Alliance for Building and Construction (GlobalABC) roadmaps and apply the GlobalABC's guide for incorporating buildings actions in the NDCs.

It is reported that a toolkit for energy building codes is under development. Vietnam and Cambodia will be the

first pilot countries to use the tool kit for energy building codes which is still under development. It is also added that the NDCs roadmap translates the NDC building sector targets into tangible targets and measurable actions, they also help identify common goals, targets and timelines for key actions across eight key activities.

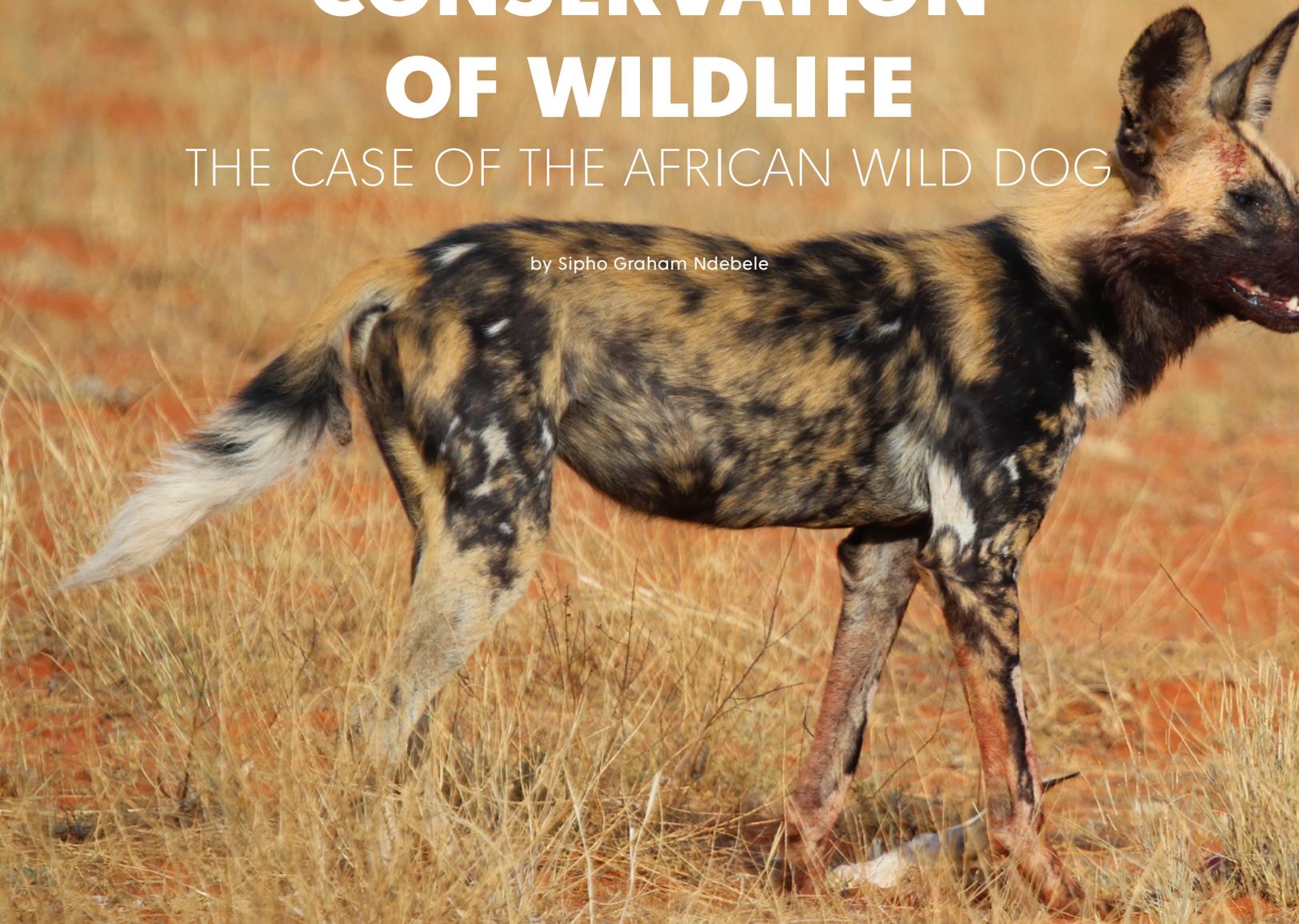
Governments are also reported to provide orientation and guidance to key stakeholders which include academia and civil society based on the roadmap. The NDCs roadmap is considered to be a steering instrument, subject to regular revisions, precisions and updates. It is also reported that a key challenge in developing national roadmaps is lack of data.

Further on, it is added that the process for developing energy codes should be a country driven process, implemented by a national team, with stakeholder involvement, aligned with national development objectives, built and strengthened on existing and planned national buildings and construction activities, all efforts brought together under one umbrella in order to enhance synergies and coordination and strive towards implementation of the NDCs.

CONSERVATION OF WILDLIFE

THE CASE OF THE AFRICAN WILD DOG

by Sipho Graham Ndebele



Wildlife consists of organisms that live and grow freely in the environment. The variety of wildlife is so rich that some species have not been discovered. Yet, most species now are heading towards extinction due to human induced challenges. Endangered species include the African elephant, black rhino, hawksbill turtle, mountain gorilla and the African Wild Dog.

Cautiousness has risen over the years on human activities effects on wildlife and biodiversity. To resolve the issue, certain methods are now

being followed in order to conserve wildlife. Wildlife conservation is the practice of protecting plant and animal species including their habitats in order to conserve the species and their biodiversity.

The African wild dog specie (*Lycaon Pictus*) is endangered. It has unique characteristic, essential for balancing ecosystem functions. Approximately, 6600 African wild dogs remain in the wild after being endangered for over 20 years. They have a colourful patchy coat with large bat-like ears and a bushy tail with a white tip that serve as a flag to keep the pack in track

while hunting with a of maximum of 40 individuals and a ground cover of about 12 miles on average. The colourful markings are unique that no two wild dogs are marked exactly the same.

The African wild dog habitat are located in forests, grasslands and deserts. In Zimbabwe, they are found at Hwange National Park. The natural life span of these species is about 10 to 12 years. In a sprint when hunting, they can reach 44 miles per hour. Before the recent population decline, packs of up to 100 were recorded. African wild dogs are social and intelligent. They have a unique



social structure that help them cooperate in taking care of their fellow wounded and sick members. Their affectionate towards each other seems cautious as they do not show aggression and less intimidation in their behavioural patterns. African wild dogs are good hunters and they have a diverse taste. They are mostly fond of antelopes, warthogs, and birds when they go for a hunt. Within the ecosystem, they play an important role by eliminating unfit and weak species through their consumption. The elimination of unfit species helps to maintain the natural balance and improve the genetic diversity of various species through the survival of the fittest.

Disturbance and loss of habitats is endangering the African wild dogs. Due to urbanization and agriculture, habitats for the African wild dog are being destroyed by human activities. Clearing land and vegetation in these habitats disturbs the conditions suitable to accommodate the African wild dog. This forces the species to migrate to other areas resulting in food shortages, disease contraction and exposure to harsh conditions which decreases its population and leads to endangerment and extinction eventually.

Sometimes, the African wild dog lives closely to human communities. This chips in serious human-wildlife conflicts that arise from pressure on resource utilisation such as water and food. When resources get scarce, the African wild dog in search for food venture into communities and attack livestock. This sparks hatred between the species and communities, such that the affected communities respond to the situation with sour intelligence which results in undesirable outputs.

Poaching deprives protected areas established to conserve wildlife in order to gain quick money from the resources locked in wildlife. Poachers use wire snares intended to kill large animals. The African wild dog is vulnerable to the traps of wire snares due to the ground it covers when hunting, 12 miles per day on average. Sometimes poachers use water sources poisoning with cyanide, normally targeted for elephants in search of ivory but in the process, it kills other species that consume the contaminated water.

To conserve wildlife including the African wild dog, there is urgent need for proactive and efficient urban planning. The urban planning process and decisions should identify unique habitats and environments which accommodate wildlife and biodiversity in order to conserve these areas through protected areas such national parks and game reserves. Urban planning can also help

to allocate and separate communities from wildlife habitats through geographic information systems and remote sensing.

Differentiating settlements and protected areas could help to reduce human-wildlife conflict as there is no direct and primary contact and interaction between communities and wildlife.

To curb poaching, awareness can be raised in the surrounding communities and also engage the communities in the decision-making process towards conservation of wildlife through schemes like the Community Based Natural Resource Management (CBNRM). CBNRM is a people-centred approach to the integration of conservation of the natural resource base (water, soil, trees and local biodiversity) and development to overcome poverty, hunger and diseases.





Value Addition on Waste Products: Trash to Cash

by Simba Machisa

IN today's world, waste has become one of the most essential resources that will lead to environmental innovation. There is need for African countries to also craft a national policy and legislation that govern value addition of waste products which are being produced from domestic purposes, industrial activities, manufacturing processes and agriculture. It is important for our government to view change as an opportunity rather than a threat. In developing countries, waste collection is the critical component of the informal economy and alleviation of poverty. However, waste has a significant negative impact on the environment and human health when inadequately managed in the society. Environmental innovation is defined as innovation that consists of new or modified processes, practices, systems and products which benefit the environment and contribute to environmental sustainability (Rennings, 2000).

TYPE OF WASTE RESOURCES:

Organic, Electronic waste, Paper, Plastic, Metal, Medical waste, Glass, Rubber etc.





Waste tyres value addition

Embracing value addition on waste resources will create employment, improve the standard of living in our communities and contribute to government revenue through payment of business and employment taxes.

OPPORTUNITIES

- Reduce - Raise awareness through education.
- Upcycle - turning organic waste into fertilizer through composting.
- Recycle- recover resources from landfill through recycling.

CHALLENGES THAT AFFECTING WASTE VALUE ADDITION

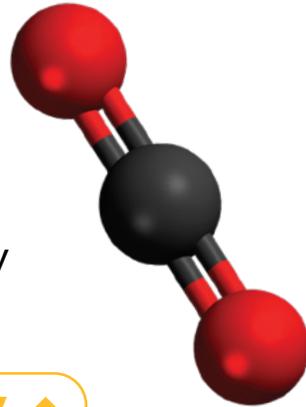
- Lack of markets
- Separation of waste at sources not being done
- No experience to implement waste value addition on a larger scale
- Lack of manpower and financial resources
- Lack of infrastructure for waste collection

DID YOU KNOW?



There is water on the moon but the challenge is how to harness it in usable forms.

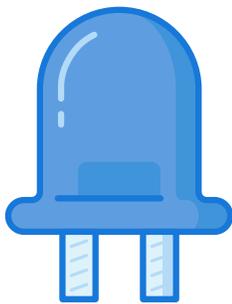
Global Carbon Dioxide emissions have risen to 416 parts per million (ppm) – the highest ever in human history



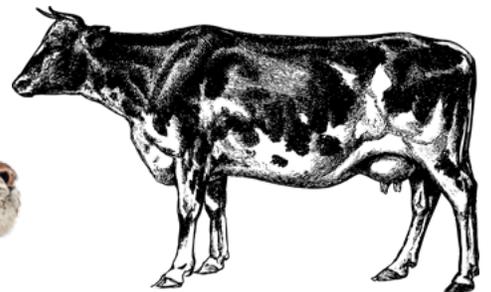
2019



is the second hottest year in the history of mankind



Over 14% of the world's population does not have access to electricity



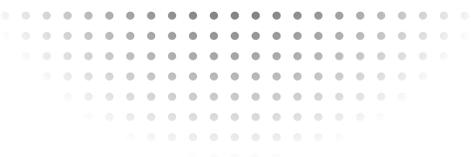
CATTLE are the leading cause of Greenhouse Gas Emissions in the agricultural sector.

TIGERS CAN JUMP 5 METRES IN HEIGHT



More than 100 000 chemicals are in use in different parts of the world.





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