

GREEN BUSINESS^{SS}

G A Z E T T E

ISSUE 2 2020

ENVIRONMENTAL RESPONSIBILITY

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ENVIRONMENTAL
STANDARDS
IMPROVE TRADE

WATER HYACINTH
ON THE RISE

WIND ENERGY
GAINS GROUND



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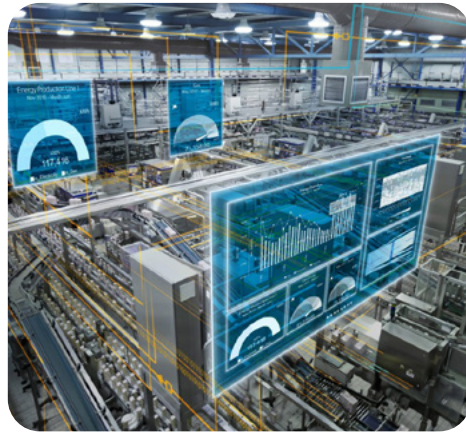
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G A Z E T T E

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A warm welcome to all new readers of the Green Business Gazette. This is the 2nd Issue of Zimbabwe's leading environmental magazine. We are very excited about the reception that this magazine received in its inaugural issue released in June 2020. Therefore, we come through to you with this latest issue, refreshed and reloaded with more environmental sustainability stories for release in the month of August 2020. A Green Economy is now inevitable!



The COVID-19 pandemic continues to ravage the world and the country in an uncontrollable fashion. All stakeholders need to work together to prevent and reduce transmission of this deadly pandemic. In this issue, we focus on international environmental standards such as ISO 14001:2015 Environmental Management Systems (EMS) as a tool for promoting international trade. Furthermore, we elaborate on the devastating effects of air pollution, a phenomenon with the potential to cause public health impacts. We also focus on the emerging threat of water hyacinth in our water bodies and how the proliferation of water hyacinth is threatening the sustainability of watercourses.

Industry 4.0 is covered in this issue, through the application of the Internet of Things (IoT) in the area of energy management and energy efficiency. Through these innovative techniques, businesses are able to save energy, reduce costs, mitigate climate change and help to attain energy security. The Internet of Things in energy efficiency is covered by guest writers Nand Gopal and Nilesh Shedge from PWC India. We also take a look at Saint Gobain's new Weber Plant which can run off the grid using solar renewable

energy technology. A world class feat of sustainability excellence.

Due to the importance of wildlife to the environment, we mention the conservation efforts being carried out towards preserving porcupines and a variety of bird species. In the same issue, we analyse the Human Wildlife Conflict (HWC) and how it is affecting the quest for ecosystem balance. Many communities are suffering due to the pressures exerted by living together with large wildlife populations. We confront this paradox and explain how specific Integrated Conservation Development Programmes can be implemented in the areas of concern.

The current Issue of the magazine, encourages businesses to adopt green and clean technologies in order to maximize resource efficiency benefits. The ability to attract more customers is guaranteed by engaging in green business activities.

An analysis of wetlands and protected areas is discussed in the magazine, including the intention to designate more pristine environments as protected areas. These efforts are meant to preserve our environmental heritage for future generations.

A wake up call is given to enterprises to ensure that climate mitigation activities are adhered to, in order to minimize the risk of global warming.

The past two decades have also seen an increase in the number of companies implementing Corporate Social Responsibility (CSR) initiatives. Are these efforts genuine or strategic efforts to divert stakeholder attention from pressing sustainability issues of their businesses? The Issue 2 of the Green Business Gazette delves into how companies can implement CSR as a business strategy and ensure that information presented in CSR reports is reliable. The ethical and profit cognitions of Corporate citizenship are analysed in this issue.

As the Editor, I welcome suggestions, comments and new approaches of dealing with environmental sustainability issues. Due to this realization, I believe that a collective approach is needed to deal with the environmental challenges of our generation.

On behalf of the editorial team, I would like to wish you a memorable reading experience.

Tawanda Collins Muzamwese
EDITOR IN CHIEF



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HAVE YOU EVER WONDERED WHY LOCAL PRODUCTS ARE NOT MAKING IT AT THE INTERNATIONAL STAGE? THE LACK OF INTERNATIONAL ENVIRONMENTAL STANDARDS IN THE MANUFACTURING OF GOODS AND SERVICE DELIVERY GREATLY HINDERS THEIR ABILITY TO COMPETE AT THE GLOBAL STAGE.

The rise of globalization and international trade has opened opportunities for local businesses to enter into international markets. Within a few hours, goods and services can reach destinations that are far away from their origin and occupy markets in other parts of the world. Whilst demand for products and services continues to rise, consumers are also beginning to demand the implementation of international environmental standards.

International Standards such as ISO 14001:2015 Environmental Management Systems and ISO 50001:2018 Energy Management Systems are successful examples of how companies can demonstrate environmental and energy stewardship. Products manufactured by companies implementing Environmental Management Systems (EMS) are better acceptable at the international stage than those manufactured by the companies which ignore environmental sustainability.

Environmental standards give customers peace of mind and confidence that the products and services are delivered in an environmentally friendly manner. Without environmental standards, companies can find their products rejected globally. It may be easy to hoodwink local consumers who mainly look at price alone in making purchasing decisions; but at the global stage it is foolhardy to ignore environmental sustainability standards.

An Environmental Management System based on ISO 14001:2015 consists of a set of policies and procedures that enable an organization to achieve its objectives. The environmental management systems (EMS) enables an organization to attain environmental protection, pollution prevention and attain sustainable development. An organisation of any kind can implement an environmental management system. Some companies claim to be implementing self-declared Environmental Management Systems but ideally, it is necessary to implement a 3rd Party certified management system such as that certified by a certification body. "Implementing ISO 14001:2015 Environmental Management Systems demonstrates commitment to managing significant environmental aspects and impacts of operations, products and services"

Companies can no longer operate without international standards. When companies ignore international standards, the door to their international breakthrough will be locked. Everywhere you go internationally in the corporate world, business cannot go ahead if Environment and Social Governance (ESG) issues are not fully addressed. Access to finance is also a restricted if there is no evidence of environmental stewardship.

If your organization is serious about international business, get in touch with your certification



body today, in order to get more information about ISO 14001:2015 Environmental Management Systems (EMS).

Successful businesses are proactive rather than reactive. In this regard, it is imperative for business to implement international environmental standards at the early stages of their businesses in order to ensure that they flourish in sustainability at an early stage.

Environmental Management Systems will benefit your organization through resource efficiency (energy, water and materials), access to international markets, improved environmental compliance, improved corporate image, better relations with community members and reduction in waste quantities.

Implementing ISO 14001:2015 makes business sense to any progressive enterprise which seeks to consolidate its global presence. The journey to global trade and international recognition cannot be complete without adherence to Environmental Management Systems requirements.

In order for environmental management philosophies to be espoused in corporate thinking, there is need for a high level of management commitment. Management commitment ensures that there is advanced implementation through inspiring employees to adopt measures that protect the environment. The future of business is hinged upon management successfully harnessing the resources within the organisation and also implementing environmental management within its operations.



The next time you travel to another continent, be prepared to drink coffee from your home country, wear a leather jacket from material sourced from your region and a bowl of starter soup with some ingredients from your corner of the world. It is possible for sweet honey, produced by your sustainable organization to find itself in any corner of the world. Until companies realize that environmental management is a business issue, they may remain in the same position for many years without growth. Going green is a passport to global excellence.



SILENT KILLER – AIR POLLUTION ON THE RISE AS COMMUNITIES THREATEN ACTION.

By Tawanda Collins Muzamwese

TAKING A BREATH OF AIR IS ONE OF THE FIRST THINGS THAT A NEW BORN BABY DOES. AS ONE GROWS UP, BREATHING CONTINUES UNTIL THE POINT OF DEATH. Breathing air is desirable only when the air is clean. The right to a clean and safe environment is a legal requirement espoused in the legislation of many countries including Zimbabwe. Section 73 of The Constitution of Zimbabwe recognises the fact that every citizen has a right to a clean and safe environment. Long before industrialisation and human civilisation, the quality of air was top notch. However, anthropogenic release of emissions, particulates and Volatile Organic Compounds (VOCs) has increased to a level affecting the ability of humans to enjoy the aesthetic environment.

Air pollution is caused by both natural and man-made sources. It is the man-made sources, also known as anthropogenic sources; which have caused untold suffering to humanity. Combustion of fossil fuels in vehicle engines, industrial processes, thermal power stations, construction and brick making processes are well known for generating both gaseous and particulate emissions.

Companies involved in manufacturing, mining, construction and other associated sectors have begun to realise that they cannot live in harmony with communities if they pollute the air. Combustion of fossil fuels, open burning of waste, veld fires and stone quarrying activities can generate air pollutants. These air pollutants vary in terms of type and quantity. Greenhouse gases such as Carbon Dioxide, Carbon Monoxide and Sulphur Dioxide continue to pose a threat to the environment and human health.

Deterioration of air quality is also seen through the rise of particulate matter including PM10 and PM2.5 which have aerodynamic diameter of 10 micrometres and 2.5 micrometres respectively. Both gases and particulates are on the rise in many industrial districts, mining towns and areas where combustion takes place. A higher number of companies are becoming very conscious and installing technologies in order to prevent toxic impacts on the communities.

Apart from causing global warming, the release of gases into the environment causes acid rain, corrosion of buildings

and health impacts such as asthmatic attacks. Communities are becoming more aware of their health and environmental rights to the extent of demanding environmental justice. The pressure from communities is also extending to crematoriums which may be undertaking cremation activities without pollution control measures. Crematoriums should install technologies that treat and detoxify toxic gases before they get into the environment. The existence of "smog" in urban areas of the world also threatens the health and well-being of urban dwellers.

Back in the 18th Century, the white-bodied peppered moth *Biston betularia f. typica* had to adapt and change itself through evolution in order to respond to harsh reality of the pollution intensive industrial revolution and it transformed itself towards the black bodied peppered moth *Biston betularia f. carbonaria*. Whilst this was possible for these moth species at that time, human beings may not be able to evolve quickly to the changing air quality and therefore face the reality of health complications and death. Polluting the air we breathe is a paradox of our time because it is the destruction of the same air which gives



us our livelihood. The irony of damaging the air which supports life functions, boggles the mind when trying to understand the cognition and motivation for such behaviour. Communities should be able to demand clean air in their environment and should be able to communicate with the companies if the air quality is deteriorating. When companies give a deaf ear to what the communities are proposing, it may be detrimental to their reputation. Leaders in the communities may end up petitioning government and regulators to take action. Media attention can also affect the prospects of a company to maintain a good reputation.

A wide array of technologies are available to curb the proliferation of air pollution. Some common technologies include electrostatic precipitators, fluidised beds, carbon capture and storage (CCS), atomised dust suppression, filter bags and use of clean energy sources such as solar energy. Preventing air pollution is much cheaper than treating it. The loss of human life cannot be quantified as this is a priceless scenario. In order to save communities from the harsh realities of polluted air, there is need to enforce

environmental laws especially air emission limits. The commitments made in the Environmental Management Plans by project developers should be adhered to. Environmental Impact Assessments must have a very strong component that addresses mitigation of air pollution throughout all stages of the project cycle. Implementation of Environmental

Management Systems (EMS) based on ISO 14001:2015 is a key solution to dealing with environmental aspects of air emissions and environmental impacts of air pollution. A *"cat and mouse game"* between communities and organisations which produce air emissions must end forthwith, in order to guarantee sustainable socio-economic development.



Photo: Green Records Company

EFFECTS OF AIR POLLUTION ON HUMAN HEALTH



- Lung cancer
 - Asthma attacks
 - Nose irritation
 - Birth defects
 - Heart disease
 - Difficulty in breathing
-



EFFECTS OF AIR POLLUTION ON THE ENVIRONMENT

- Acid rain
 - Global Warming and Climate Change
 - Smog
 - Low visibility
-



WHAT CAN WE DO TO CURB AIR POLLUTION?

- Adopt clean technologies in industry
 - Use renewable energy
 - Avoid open burning
 - Dust suppression at construction sites
 - Prevent veld fires
-



WHO IS AT RISK?

- All adults who spend time outdoors
- Children who are still developing their physiological systems
- People with pre-existing conditions (e.g. lung disease, heart disease, diabetes and asthma)



Energy Efficiency through IoT based Energy Monitoring & Analytics System (EMAS)

E Nand Gopal, Manager – Clean Energy, PwC India
Nilesh N. Shedge, Energy Tech. Director, Enerlly.com

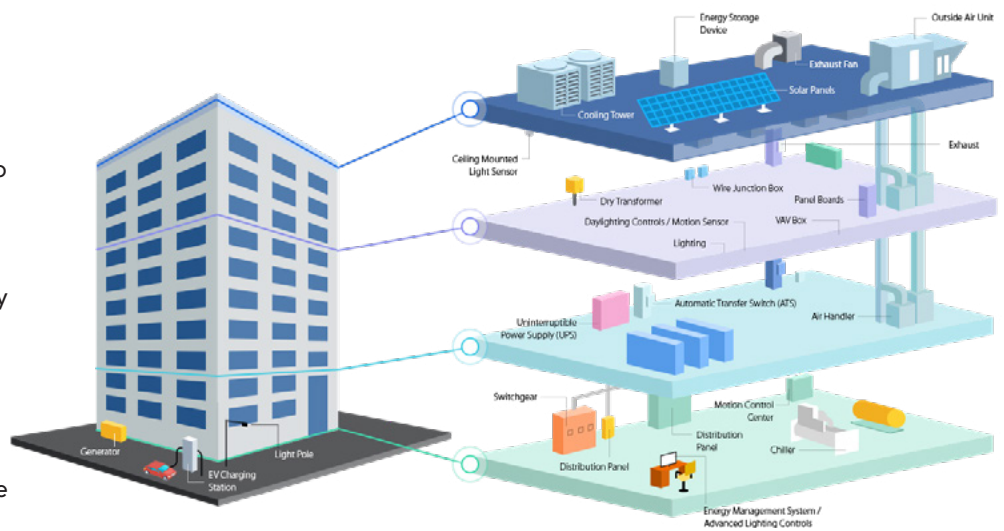
THE INDUSTRIAL SECTOR PLAYS A PIVOTAL ROLE IN THE OVERALL ECONOMIC DEVELOPMENT, EMPLOYMENT CREATION AND EFFECTIVE REDUCTION IN POVERTY OF THE COUNTRY. Zimbabwe's manufacturing sector contributes nearly 10% to the country's GDP. The prevailing power deficit leads to unmet demand/load shedding in end-use sectors including industries. Industries, competing in the global markets, need to be watchful of both, production costs as well as environmental impact of their activities. The rising energy costs and increasing awareness of adverse environmental impact has brought energy efficiency to the forefront.

The rationale for energy efficiency (EE) in the country are three-fold. Firstly, the vintage of technology in manufacturing sector requires innovative approaches to energy conservation. Energy technology is changing so rapidly that state-of-the-art techniques have a half-life of ten years at the most. Secondly, the economy is on a track of recovery, which implies the capacity utilization of the industries is gradually increasing, thus moving for energy efficient options can help improve the product yield. Thirdly, a reduction in energy costs to manufacture the product can be immediate and permanent, thus enhancing profit margins of industries.

Based on experiences of travelling across the country and conducting energy audits of multiple industries, in Zimbabwe, industries are typically reluctant to invest in energy monitoring. For instance, Panasonic factory in Japan has 6000 monitoring points (learning from a site visit, 2013). Similar size factory in Zimbabwe would fail to reach 100 monitoring points. The most recent advance in EE in industry is monitoring of process parameters based on Internet of Things (IoT) and analysis of behavior/pattern of data using machine learning

to provide precise control and run factories efficiently.

A close and real-time monitoring of energy flow data is thus a necessity for reducing energy costs and increasing environmental friendliness. Industries (and commercial facilities) usually depend on the monthly electricity bill to assess the energy performance of their plant, but a monthly energy bill can only provide a broad picture, which isn't enough to analyze the energy distribution down to applications and >

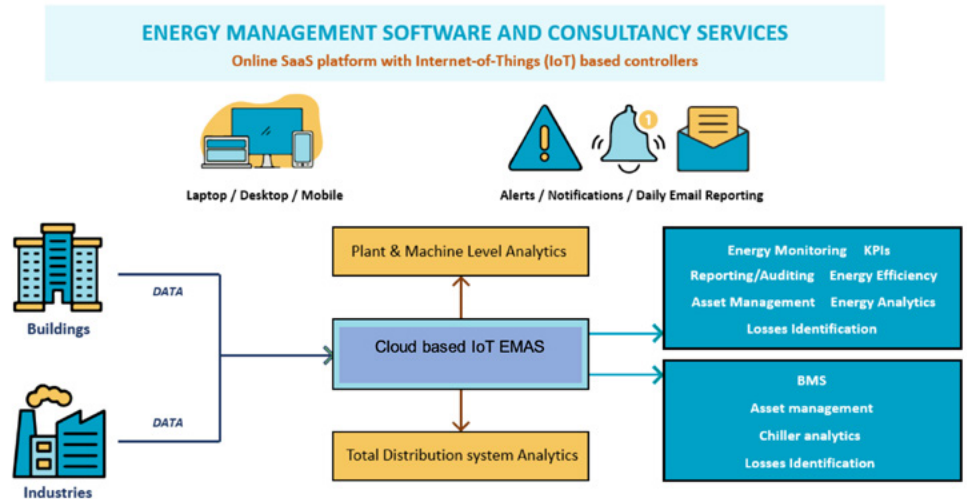


doesn't provide actionable information. For insights and proper analysis, the real-time energy and power data is of utmost importance. A typical cycle of energy efficiency improvement is presented in the figure.

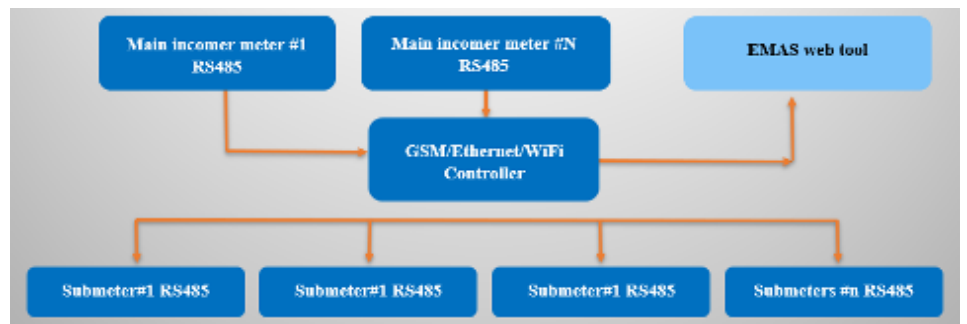
A typical energy management system uses energy meters, air / water / steam flow meters to measure the data. Recorded data is transferred to a system and engineers spend days analyzing the data to draw patterns and arrive at meaningful trends (which is a tedious process and is not religiously followed by industry). Based on these trends, energy losses are quantified. A plan of action is drafted to either reduce, reuse or optimize the energy consumption. The verification is done by recording the data post implementation of EE measure. There is a lot of human involvement in the process and it is prone to errors. Since the manual activities are not real-time, many opportunities to take immediate action are lost. As a result, the inefficiencies get aggravated over a period of time leading to excess production costs.

In an IoT based energy management system, all the tasks in the Cycle of Energy Efficiency, except "Optimization" i.e. taking action to reduce the losses is automated and done by an IoT tool, thus minimizing human errors. The IoT tool assists in making an informed decision by providing insights into energy performance indicators of total plant, sub-process, machine level and to identify losses in systems. The IoT system then uses data analytics-based machine learning to predict and capture the losses in the system such as over/under loading, idle running, leakages etc. The IoT system can be tailored based on the needs of the industry, providing hourly/daily/weekly energy performance reports and send alert notifications through WhatsApp, Email or alarm in case the energy performance indicators vary beyond pre-set thresholds.

A systematic view of an IoT based energy management and analytics tool is presented in the figure.



An Internet of Things (IoT) based Energy Analytics and Monitoring system comes with a hardware controller and Software-as-a-Service (SaaS) online platform, that assists industries to gain competitive advantage by gaining energy efficiency and compliance. The IoT controller collects the data in real-time through RS485 based energy meters and transmits it to cloud platform, where it is analyzed and displayed on the online secured portal (see figure for IoT EMAS setup).



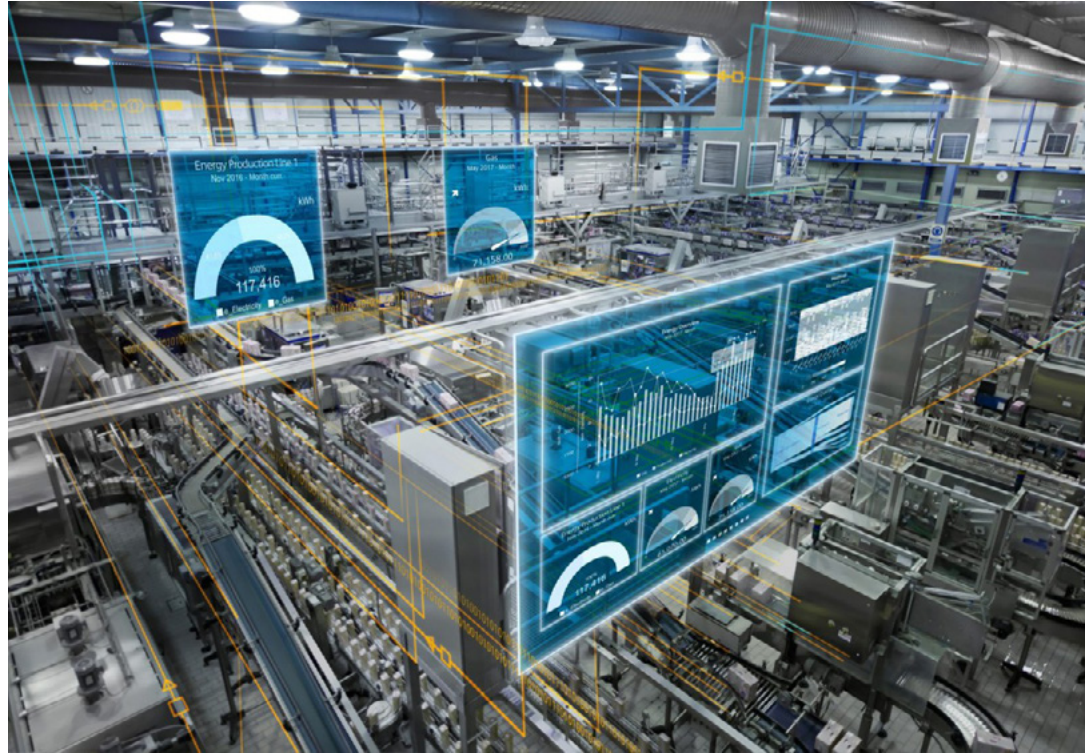
The online secured portal can be accessed using right credentials (login/password) through any digital device having Internet connectivity. Under the hood, IoT operates complex algorithms that analyze parameters against different international standards such as ISO 50001:2018 Energy Management System. An IoT EMAS can offer following features.

1. Real time monitoring parameters like Voltage, Current, PF, kVA, kVAh, kW, kWh, Hz and power quality parameters harmonics, unbalances.
2. Mapping of Analytical parameters like Specific Energy consumption (kWh per unit production), Specific Energy Cost and Specific GHG Emission
3. Easy access to historical data (measured/analytical data) which can be downloaded from the portal
4. Automated Benchmarking, Target setting which enables to adopt LEAN manufacturing techniques such as KAIZEN/5S
5. Losses identification in equipment such as Transformers, Air compressors, Pumps etc.
6. Asset management for Solar Photovoltaics, Diesel Generator set, etc.
7. New features with more analytical capabilities can be added frequently as a software update, making it more advanced
8. Set and receive alert and notifications for parameters for taking remedial action
9. Daily Automated Email reporting

10. Easy integration of communication-based flow meters/gas meters BTU meters for HVAC and other systems

The tool can assist industry build a roadmap for energy efficiency based on the feedback received from analytics software. Successful case studies have proven energy savings results of up to 10% in industry and the payback period is under one year. IoT based EMAS can help industry reduce energy cost, enhance profitability and assist Zimbabwe achieve its GHG reduction targets.

Disclaimer: The views in the article are of authors and do not reflect the views of firms associated.



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CIVIL SOCIETY ORGANIZATIONS PILE PRESSURE ON AFDB TO PUBLICIZE FOSSIL FUEL FINANCING EXCLUSION POLICY

By Wallace Mawire

SEVERAL CIVIL SOCIETY ORGANIZATIONS (CSOS) FROM AFRICA AND A FEW INTERNATIONAL ORGANIZATIONS HAVE SUBMITTED A PETITION TO THE PRESIDENT OF THE AFRICAN DEVELOPMENT BANK, DR AKINWUMI ADESINA CALLING ON THE LEADERSHIP OF THE BANK TO IMMEDIATELY PUT IN PLACE AND PUBLISH ON THE AFDB WEBSITE A FOSSIL FUEL FINANCE EXCLUSION POLICY WHICH STATES THAT THE BANK WILL NOT FUND, PROVIDE FINANCIAL SERVICES OR CAPACITY SUPPORT TO ANY COAL PROJECT ON THE AFRICAN CONTINENT.

The petition was submitted on Africa Day on the 25th of May, 2020 by the Zero Emissions Omissions Campaign led by a coalition of NGOs, CSOs and volunteers from across the African continent. The initiative is conducted by the African Climate Reality Project based in South Africa.

According to the organizations, the call is in accordance with previous correspondence sent to the AfDB President in October 2019, where they welcomed their announcement made on 24 September 2019, in which they reiterated AfDB's commitment to no longer fund coal on the continent, but to rather build the "largest solar zone in the world" in the Sahel region.

"While recognising your commitment to rid Africa of coal's influence and to accelerate the use of renewable energies, we are convinced that, given the climate emergency and the short timeline to achieve net-zero emissions, the AfDB can and should do more by officially and definitively disengaging itself from any current or

future fossil fuel projects," the organizations said in the letter.

In the petition, the organizations said that according to the Intergovernmental Panel on Climate Change (IPCC), Africa is expected to experience devastating climate change impacts. These impacts are already affecting the continent and its people, hampering economic development, sometimes eroding years of economic progress, exacerbating conflict, and pushing hundreds of thousands of people every year into forced migration, especially those living in arid zones and areas affected by desertification and floods.

Recently, torrential rains triggered devastating floods and landslides across East Africa, aggravating an already challenging situation as countries in the region battle a triple crisis of climate change impacts, the corona virus pandemic, and the locust invasion.

The destruction caused by the floods killed hundreds of people in Kenya, Uganda, Somalia, Rwanda, and Ethiopia, while displacing hundreds of thousands - and also ironically washing away a hospital in Uganda as people move into makeshift camps which make social distancing impossible. Migration also often depends on mobility and access to resources, which means those that were most vulnerable to the floods were unable to migrate. Instead, they have remained in the same locations, increasing their susceptibility to future climate-induced harms.

It is reported that while the extreme weather events and associated risks threaten the lives and livelihoods of millions of Africans, the urgency to shift African economies' dependence on fossil fuel based energy generation to renewable energies has never been more crucial.

It is added that a report by the IPCC highlights that if fossil fuel projects continue at the current global rate, Africa is heading straight for an average warming of 3 to 4 °C as a climate hotspot - and a new study shows that globally, up to 3 billion people will be living in a climate too hot for human survival by the year 2070.

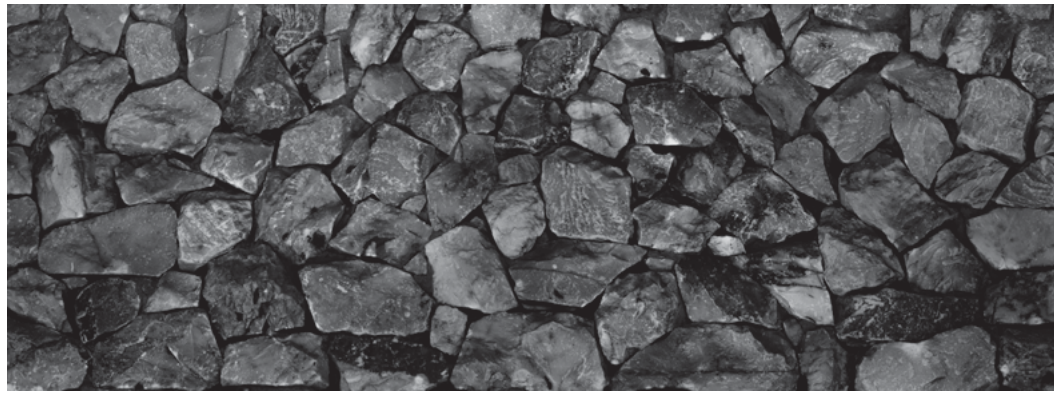
The scenario would have disastrous consequences, ranging from extreme heat that would affect the majority of the continent's land to increased risks of extreme drought, extreme flooding, and a decline in agricultural yield, leaving millions of people with no food to eat.

The IPCC report also made it clear that anyone who supports the fossil fuel industry knowingly, contributes to untold suffering around the world. Despite this scientific consensus, in November 2019, the AfDB approved a long-term Senior Loan of \$400 million to support the building of an integrated Liquefied Natural Gas (LNG) plant, including a liquefaction facility in Mozambique.

The organizations said that in doing so, the Bank is ensuring that Africa is locked into years of emissions that it simply cannot afford.

Recent data reveals that solar, wind and other green technologies now provide more than one-third of the world's power. The organizations said in the letter that while this signifies a positive trajectory for the future of renewable energy, the current economic crisis due to the corona pandemic is likely to slow this process.

However, experts show that there are long term prospects for renewables to emerge stronger than ever, especially if governments and major financial institutions integrate support for clean energy into COVID-19 economic-recovery programs.



According to the organizations presenting the petition, given the urgency of the climate crisis, 2020 has become a fundamental year in which the AfDB must support the African continent in increasing our ambition to leave fossil fuels in the past, and leap for the age of renewable energy and sustainable development.

Therefore, the AfDB has been urged to immediately develop an AfDB policy that the bank will not fund, provide financial services, or capacity support to any fossil fuel projects on the African continent following the development of a draft policy, immediately publish the draft on the AfDB website and allow a public comment period of a minimum of 30 days, shift the AfDB's investment portfolios to 100% renewable energy projects and sustainable, low-emission agriculture and infrastructure, publish a roadmap to reduce portfolio-wide emissions and align with 1.5°C Paris Agreement goal, publish a timeline for the construction of the "largest solar energy zone on the planet" in the Sahel region before the end of 2020 and support recovery and response plans of the most vulnerable countries as grants, not loans to avoid worsening the debt crisis.

According to Nicole Rodel, Communications Officer for the Climate Reality project, this is the second petition to the AfDB which the Zero coalition has delivered on the same initiative.

She said that the first one which began in November 2018 called on the AfDB to shift to renewable energy and improve their transparency. The petition gained over

6 800 signatures by the time of Africa Day last year in 2019, according to Rodel.

She said they delivered the results to the AfDB at the Southern Africa Regional Development and Business Delivery office and met with representatives of the bank to discuss the petition.

Rodel added that there was some positive news in 2019 due to efforts of so many civil society organizations and individuals when the AfDB pulled out of funding the Lamu coal plant in Kenya and when the President of the bank announced at the United Nations Climate Action summit that the bank was getting out of coal.

She added that following that announcement, the coalition sent communication to the bank last year to welcome the announcement and called on the leadership of the bank to put in place and publish a coal exclusion policy and shift the investment portfolio to 100% renewable energy projects and sustainable, low-emission agriculture and infrastructure initiatives.

They have also developed a digital toolkit which is being used to support and share the petition to tell climate action stories.

According to Rodel, on the recent petition, at least 336 individual signatures have been appended including endorsements from 26 organizations.

"Our hope is that we can all work together to create a more sustainable, climate resilient, and just future for the African continent," Rodel said.

WATER HYACINTH SPREADS UNCONTROLLABLY ACROSS THE COUNTRY'S WATER BODIES

By Bright Chituu; Photos: Green Records Company

The increased proliferation of water hyacinth in different water bodies across Zimbabwe has become a grim reality of the dangers of invasive alien species. Unprecedented growth of water hyacinth in water bodies over the years, entails urgent action to curb the problem, which is fast becoming an issue of national importance.





UNCONTROLLED DISPOSAL OF EFFLUENT, SEWAGE AND URBAN AGRICULTURE IN UPPER CATCHMENT ACTIVITIES HAS CAUSED AN INCREASED NUTRIENT LOAD IN WATER BODIES. WATER POLLUTION REMAINS BY FAR THE LEADING FACTOR RESPONSIBLE FOR PROMOTING THE GROWTH OF THIS UNWANTED WATER WEED. FAILURE TO DEAL WITH WATER HYACINTH COULD FURTHER AFFECT WATER QUALITY, CAUSE FISH DEATH, INCREASE COSTS OF WATER TREATMENT AND REDUCE THE AESTHETIC USE OF THE ENVIRONMENT. ANALYSIS OF WATER HYACINTH IN THE LAST 40 YEARS FROM 1980 TO PRESENT INDICATES THAT THE PROBLEM IS WORSENING EACH AND EVERY DAY. DRASTIC MEASURES ARE THEREFORE REQUIRED IN ORDER TO CONTROL THE COLONIZATION OF WATER BODIES BY WATER HYACINTH.

Water hyacinth, botanically known as *Eichhornia crassipes*, is considered the most notorious, free-floating alien weed that originated from the Amazon basin and Ecuador regions of Brazil, South America. The plant is non-native to the environment and it inhibits growth of many species. The proliferation of water hyacinth is becoming a problematic global phenomenon.

The introduction of water hyacinth across the tropical, subtropical, and warm temperate regions of Africa, Asia, Australia, Europe, and North America was through human activity. Humans introduced water hyacinth as an ornamental species to adorn inland water bodies. The large blue, purple and violet flowers of water hyacinth, along with their glossy leaves, and bulbous petioles attributed to the popularity of water hyacinth as an ornamental species. The International Union for the Conservation of Nature (IUCN) has identified water hyacinth as one of the top 10 invasive alien species in the world.

The spread of *Eichhornia crassipes* has triggered adverse ecological, economic and social impacts in warm tropical and sub-tropical countries globally. Firstly, water hyacinth affects the ability to abstract water from water bodies. It also adversely affects the ability to undertake social and recreational activities at the water bodies. Selected recreational activities include boat cruising and canoeing. Water hyacinth is denoted by its' thick, broad, glossy leaves and its floating characteristics. At its peak, water hyacinth grows almost four feet off the water's surface and extends below the water surface with purple feather-like roots.

Water Hyacinth as an invasive alien species, reproduces quickly and can rapidly cover the surface of a water body in very little time. Consequently, sunlight is prevented from penetrating



through the water column, leading to the death of native aquatic plants. The death of these native plants leads to an influx of bacteria that consume the decaying plant matter. These bacteria deplete the dissolved oxygen and available resources leading to the death of fish, and other types of aquatic life. Ecological effects of water hyacinth include the loss of local aquatic biodiversity. Social impacts of water hyacinth infestation include the reduction in water recreational activities (swimming, fishing and boating).

In the year 1937, Zimbabwe recorded the first presence of water hyacinth and by the end of 1988, the infestation had expanded to include the Lake Chivero, Manyame Dam, Manyame river and its tributaries, Lake Mutirikwi, wetlands in Chinamora, Mutoko and Bindura as well as dams in Triangle. Even if the invasion has affected many water bodies, Lake Chivero is of great concern, since it is the main water reservoir supplying Harare.



Photo: Green Records Company

Lake Chivero, formerly known as Lake McIlwaine, stood as the most affected waterbody as a result of the diminished water quality. The spread and rapid invasion of water hyacinth in Lake Chivero is largely exacerbated by high levels of eutrophication aggravated by nutrient-rich agricultural run-off, effluent from sewage and industrial manufacturing.

Due to high levels of contamination, an increased level of chemicals is required for water treatment. This is also associated with increased cost of water purification.

Efforts to mitigate the spread of water hyacinth started in 1956 when herbicides were used as a control measure. In 1986 manual removal of weeds was adopted following the concern of the possible undesirable effects caused by herbicides. However, this method had limited success because physical removal of weeds proved to be expensive. Instead of reducing the spread of the weed, the manual removal becomes an indirect way of spreading the weed. This is because the physical removal releases the offspring plants hence promoting its infestation.

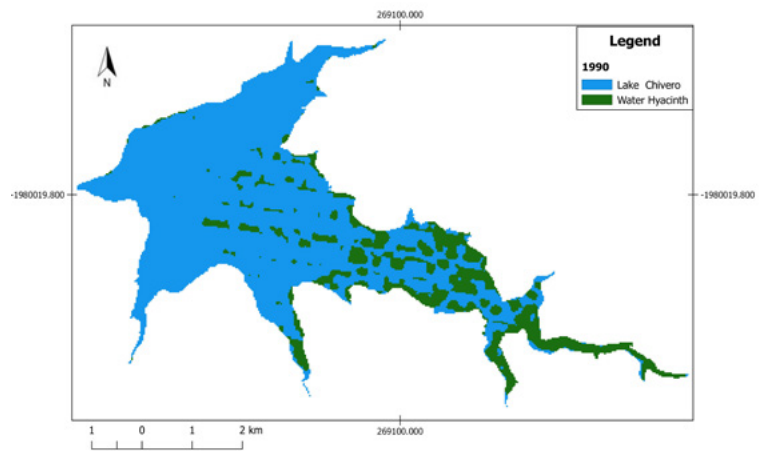
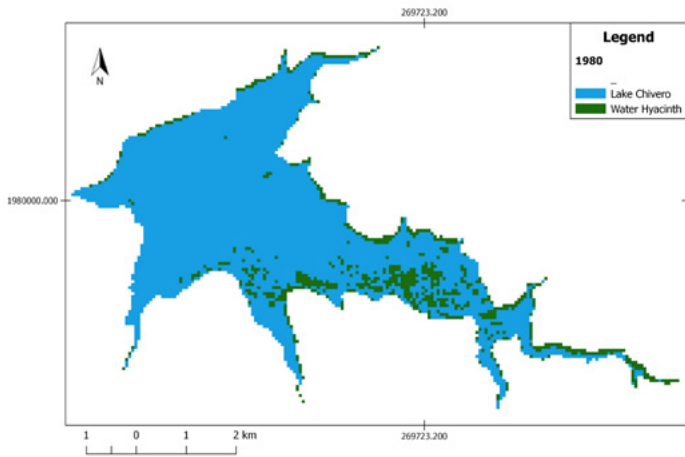
Curbing the problem of water contamination in Lake Chivero

could be done through the practice of Integrated Water Resource Management (IWRM), Resource Efficient and Cleaner Production (RECP), catchment management, enforcement of environmental laws, watershed management and public awareness.

Scientific research confirms that water hyacinth is spreading in the water bodies of Zimbabwe, hence the need to promote measures that improve water quality. Within the next 20 years it may be difficult to carry out a boat cruise in some of our water bodies and the treatment of water will become more costly due to the deadly effects of water hyacinth. Action should begin now.

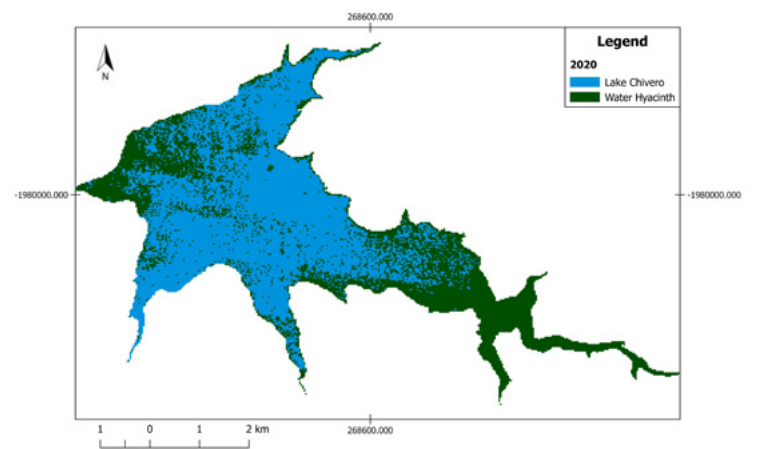
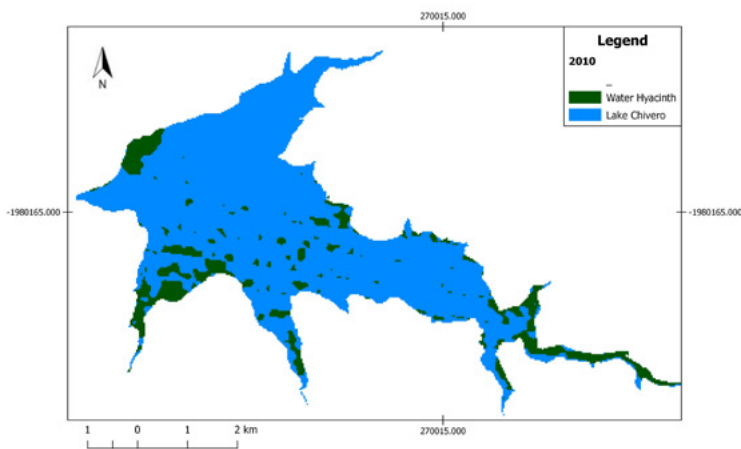
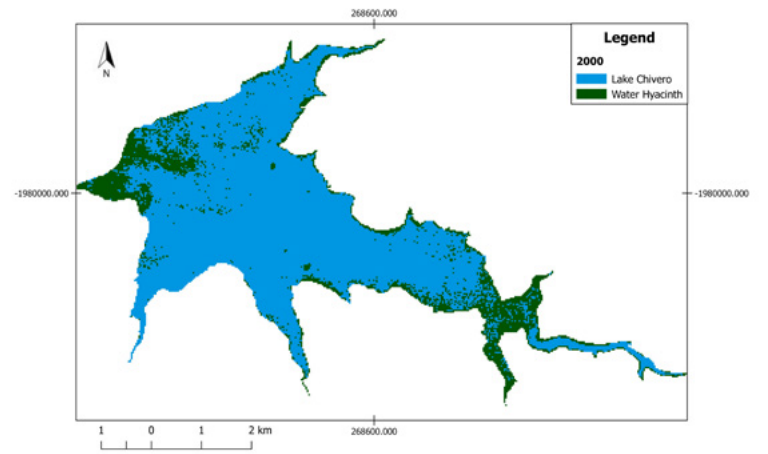


Photo: Green Records Company



Year	Hectares	Percentage
1980	368.48	13.96%
1990	473.76	17.94%
2000	450.3	17.05%
2010	453.23	17.17%
2020	894.62	33.88%

Lake Chivero Surface area 2,632 ha





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HARARE'S WETLANDS PREDICAMENT AND THE PLEA TO ENHANCE SUSTAINABILITY OF LAKE CHIVERO

By Tendai Keith Guvamombe; Photos: Green Records Company



ENVIRONMENTALISTS ARE STILL GUIDED BY A NOTION THAT HARARE WAS BUILT IN AREAS SURROUNDED BY WETLANDS. RESEARCH CONDUCTED HAS SHOWN THAT GREATER PART OF THE CITY HAS WETLAND AREAS.

Since time immemorial, the extensive network of water-rich low lands has benefited both humans and ecological systems. However, the harmonious beneficitation has come to elapse with the increase in human activities.

Ecologically, wetlands are a permanent shield for endangered species, flora and fauna. The most adorable process is the natural purification of water which runs directly into river basins. Wetlands play multiple roles in providing ecosystem services.

Harare's case has seen wetlands being affected by pollution. Wetlands try by all means to provide natural purification processes, but albeit to a certain limit.

"Harare's water crisis will not be resolved through borehole drilling but the ability to hold a sustainable future for local wetlands," says Julia Pierini, an Environmentalist.

Local Authorities could be spending millions of dollars on water treatment chemicals due to reduced water quality.

Selestino Chari, Harare Wetlands Trust, Programs Manager reiterated that local authorities are spending more than double on water processing chemicals. Embracing sustainable wetlands preservation would effectively ease local authorities' budget expenditures.

Environmentalists and the Civic Society Organisations (CSOs) have been lobbying with Local Authorities to deal with emerging developments on wetlands. The housing developments in some wetlands located in Zimbabwe's capital city have also become an issue of concern.

In an interview with Green Business Gazette, Bornwel Choga, another Environmentalist, confirmed the link between Harare's wetlands and Lake Chivero.

"Both Upper Marimba and Lower Marimba rivers originate from wetlands and they feed directly into Lake Chivero." "Mabvuku spring gives rise to the development of a wetland which gave birth to Mukuvisi River a major tributary which feeds into Chivero Dam."

Illegal land developments have resulted in the siltation of local rivers a major threat to the sustainable future of Lake Chivero.

Professor Christopher Magadza from University of Zimbabwe Department of Ecological Studies said water of Lake Chivero has dwindled due to siltation of tributaries and streams.

"Siltation has affected the depth of the lake and this will worsen the water crisis in the City of Harare."

According to the renowned Professor, the depth of the Lake has been reduced from 41 metres in 2010 to only 17 metres in 2019. The statistics are based on his research findings as a University Lecturer.

"We usually come to measure the depth of the lake on a periodic basis. Ten years ago the depth was 41metres, but it has been reduced to 27 metres and today the depth is 17 metres."

Professor Magadza cited wetlands invasion as the main culprit to the siltation of the water body which is the only hope for the Capital City.

"Wetlands Invasion is the main cause of siltation of Lake Chivero. Failure to curb the ongoing activities will affect Harare".

Waste disposal from unsustainable catchment activities has contaminated the life-saving waters of Chivero Dam.

Before the onset of the current predicament, wetlands used to neutralize anthropogenic substances and waste through natural purification.

Perturbed by the developments, Minister of Environment, Climate, Tourism and Hospitality Industry, Honourable Mangaliso Ndlovu has launched a campaign to declare Lake Chivero and Darwendale Dams as Ecologically Sensitive areas.

This will be done in terms of (113) (1) of the Environmental Management Act (EMA) [Chapter 20:17] as read with Section 7 (2)

(a) of the Environmental Management (Effluent and Solid Waste Disposal) Regulations 2007 (Statutory Instrument 6 of 2007).

“The Minister of Environment, Climate, Tourism and Hospitality Industry intends to declare Chivero and Darwendale Dams and their respective catchments as Ecologically Sensitive Areas, The declaration also seeks to facilitate the restoration of ecological health of the water bodies allowing Harare and its satellite towns to continue the ecosystem services that they provide,” reads part of the Press Statement issued by EMA.

The development will probably spare wetlands and existing water bodies from human activities.

Wetlands Background

Calls to uphold Wetlands Preservation and Protection was adopted in 1971 by a group of environmentalists who met in Iran at a place known as Ramsar.

This became known as the Ramsar Convention. Zimbabwe is amongst global nations which are signatories to United Nations Convention on Wetlands Protection.

Environmentalists have been pushing for the domestication of the Ramsar Guidelines on Wetlands Protection.

Monavale Vlei is an example of a Ramsar Site which is found in the Capital City along the Lower Marimba River.

“The Minister of Environment, Climate, Tourism and Hospitality Industry intends to declare Chivero and Darwendale Dams and their respective catchments as Ecologically Sensitive Areas”

Photo: Green Records Company

EUROPE CERTIFIES FIRST ELECTRIC ENVIRONMENTALLY FRIENDLY AEROPLANE



By Wallace Mawire
Photos ©Pipistrel

IN A MOVE HIGHLIGHTING PROGRESS TO INTRODUCE ENVIRONMENTALLY FRIENDLY AVIATION SYSTEMS GLOBALLY, THE EUROPEAN UNION AVIATION SAFETY AGENCY (EASA) HAS ANNOUNCED THE CERTIFICATION OF AN ELECTRIC AIRPLANE, THE PIPISTREL VELIS ELECTRO, THE FIRST TYPE CERTIFICATION WORLD-WIDE OF A FULLY ELECTRIC AIRCRAFT, ALSO REPORTED TO BE AN IMPORTANT MILESTONE IN THE QUEST FOR ENVIRONMENTALLY SUSTAINABLE AVIATION.

"This is an exciting breakthrough," said EASA Executive Director Patrick Ky. "This is the first electric aircraft EASA has certified but it will certainly not be the last, as the aviation industry pursues new technologies to reduce noise and emissions and to improve the sustainability of aviation."

It is reported that the Velis Electro is a two-seater aircraft intended primarily for pilot training. Slovenia-based Pipistrel is a leading small aircraft designer and manufacturer, specialised in energy-efficient and affordable high-performance aircraft. The Velis Electro joins a product line-up of similar, but conventionally powered, aircraft.

It is added that the certification, completed in less than three years, was only possible in that time-frame due to close cooperation between Pipistrel and EASA, with the common goal of ensuring the aircraft met the high standard of safety needed for certification. It has also been added that the project also brought important learnings that will support future certifications of electrically powered engines and aircraft.

The aircraft is powered by the first certified electrical engine, the E-811-268MVLC, certified by EASA for Pipistrel on May 18, 2020.

"The type of certification of the Pipistrel Velis Electro is the first step towards the commercial use of electric aircraft, which is needed to make emission-free aviation feasible. It is considerably quieter than other airplanes and produces no combustion gases at all," said Ivo Boscarol, founder and CEO of Pipistrel Aircraft. "It provides optimism, also to other electric aircraft designers, that the type certification of electric engines and airplanes is possible."


The certification project developed in two streams, firstly the typical certification activities related to the aircraft and in parallel a coordinated flight test program using a fleet of (non-certified) Alpha-Electros under EASA permit to fly.





It has also been reported that during the course of the projects, EASA gained first-hand experience in electric flight, learning more about batteries and their management systems, as well as electrical engine power units. This information has been used to develop the E & HPS Special Condition to further enable electric flight.



A close-up photograph of a person's hand plugging a blue and black electric vehicle (EV) charging cable into the charging port of a silver car. The background is blurred, showing other vehicles and bright light, suggesting an outdoor parking or charging station. The text is overlaid on the top half of the image.

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OFF THE GRID SAINT - GOBAIN'S NEW PLANT HARNESSES RENEWABLE ENERGY



THE MONTH OF FEBRUARY 2020 SAW THE OPENING OF THE NEW SAINT-GOBAIN CONSTRUCTION PRODUCTS ZIMBABWE (SGCP ZIM) TILE ADHESIVE PLANT IN MSASA, HARARE. This further cements the company's role as the market leader in designing, manufacturing and distribution of building materials and solutions which are key in buildings, infrastructure, transportation and industrial applications.

The Weber Plant, at its full capacity will be able to produce 15 000 tonnes of tile adhesive per annum as the company strives to deliver on its goal of providing high quality solutions that ensure comfort and convenience in homes as well as in industry.

Perhaps, the most outstanding feature about this new Weber plant is that it comes with a 36kWp solar installation that will allow the factory to operate off the grid whilst a number of manufacturers are battling with incessant load shedding as well as the high cost of electricity. The building being suitably located in the Msasa industrial area, away from

buildings or shading from trees, fully harnesses the sun with roof mounted panels. This means that the manufacturing plant will benefit from extended periods of unimpeded sunlight shining down and generating the much-needed energy for the plant.

At a time when most manufacturing plants are having to use diesel generators to meet production targets, which comes with a recurring cost of fuel and a carbon footprint, Saint-Gobain has ensured that it meets its production targets and the company's commitment to contribute to the common good by limiting the impacts of its activities on the environment.

The company is not only pushing towards sustainable industrial production, but also continuing to serve the region and generate much-needed foreign currency by exporting to Malawi, Mozambique and Zambia.

This new Weber plant developed by Saint Gobain demonstrates how industry can take a lead in Inclusive and Sustainable Industrial Development through fostering industrial productivity, environmental stewardship, creation of employment and promotion of Sustainable Development Goal (SDG) Number 7 (Clean and Affordable Energy).



The new Saint Gobain Weber Plant in Harare – a case study of renewable energy and green manufacturing

RARE BUT PRECIOUS THE PORCUPINE NOT ENDANGERED - YET IMPORTANT



By Wadzanai Diana Manyame

PRESERVATION OF BIODIVERSITY IS KEY TO THE SUSTAINABLE DEVELOPMENT OF THE WORLD. IN THIS ISSUE WE PROFILE ONE OF THE FASCINATING FAUNAL SPECIES EXISTING ON EARTH - THE PORCUPINE. SOMETHING DIFFERENT FROM THE USUAL, A RARE BUT PRECIOUS ANIMAL THAT IS ON DEMAND FOR ITS QUILLS, BEZOARS AND MEAT. THE PORCUPINE IS A LARGE MAMMAL WHICH IS NOCTURNAL, SOLITARY AND SLOW MOVING. THE RODENT HAS SHARP QUILLS ON ITS BACK, WHICH CAN BE A MENACE TO PREDATORS. DESPITE INCREASED AWARENESS ON BIODIVERSITY CONSERVATION ACROSS THE WORLD, PORCUPINES REMAIN VULNERABLE TO POACHING, HABITAT LOSS AND HUNTING. THESE HERBIVORES ARE ADAPTABLE AS THEY ARE FOUND IN A VARIETY OF HABITATS, AS LONG AS THERE IS VEGETATION. A PORCUPINE IS NOT LISTED AS AN ENDANGERED SPECIES BUT IS REGARDED AS A THREATENED SPECIES.

A porcupine is a type of rodent which is found in several regions across the world. About 25 species are in existence across the globe. The porcupine is native to more than 30 countries. They occur in North America, South Africa, South America, Asia and Africa in a wide range of vegetation types from semi-desert to tundra. These regions have been termed as the Old World and the New World and it has been discovered that they live on the opposite sides of the Atlantic Ocean.

Old World porcupines (family Hystricidae) live in Europe, Africa, and Asia. Examples include the North African crested porcupine, the African brush-tailed porcupine and the Indian crested porcupine. The New World porcupines (family Erethizontidae) live in North, Central, and South America and these include the Canadian porcupine, the Mexican hairy dwarf porcupine and the Brazilian porcupine. In Zimbabwe the most common porcupine is called the Cape Porcupine (*Hystrix Africae australis*).

All porcupines have short, stocky legs, but their tails range from short to long, with some being prehensile. The most striking feature on the porcupine are its quills, which are sometimes termed spines. It is believed that each porcupine has up to 30 000 hollow quills on its body and no matter how many it loses, these quills always grow back. The quills are used to make some of Africa's favorite ornaments and some even believe them to be a good luck charm. The porcupine quills can also be dyed and used in decorative work. The hollow rattle quills also serve as musical instruments and were once used as containers for gold dust. As a result of these perceived or real demands, the life of the porcupine is threatened.

The quills take various forms depending on the species but all are modified hairs embedded in skin musculature. Old World porcupines (*Hystricidae*) have quills embedded in clusters, whereas in New World porcupines (*Erethizontidae*), single quills are interspersed with bristles, underfur and hair. These quills can grow up to 35cm long. No porcupine can throw its quills. Instead they detach easily like any hairs and fur on any other animal. Thus the quills are not as dangerous as they were described by the philosopher Aristotle who warned of the dangers of getting too close to a porcupine. Aristotle described the porcupine as the quilled beast which could shoot its deadly needle like darts over great distances, at hunters and predators. The quills on any porcupine, whether new world or an old world, are just modified hairs made out of keratin. Porcupines have muscles at the base of each quill that allow them to stand up when the animal is excited or alarmed. Like all hairs, quills do shed and when the porcupine shakes, loose quills can fly off but not with a deadly force.

Even though the porcupine bears quills, its life is still in

danger from predators and human beings. One porcupine predator, the fisher, is able to flip the North American porcupine onto its back, exposing its unprotected belly making it more vulnerable. In North America, the fisher has been reintroduced in some areas with the aim of bringing destructive porcupine populations under control. Large cats especially lions and human hunters threaten Old World porcupines whilst predators such as martens, wolverines, pythons, eagles, and great-horned owls threaten the New World porcupines. In Zimbabwe, the porcupine is a revered totem called "Ngara, Chiwasa, Chikandamina or Nungu" in local Shona dialect.

Other than the wildlife predators, another threat in the life of a porcupine comes from the human wildlife conflict. As the human population increases, there is pressure on available resources and the need to exploit new lands arises. Human beings go on to exploit forests and idle land which is a habitat to animals such as the porcupine. The short

sighted and slow-moving porcupine becomes victim to the land clearing and forest fires either through death or being forced to look for a new habitat. Porcupines feed on cultivated crops too. When humans settle close to a porcupine hub, the porcupine can become a serious agricultural pest. To get rid of them, porcupines are smoked out of their burrows, hunted with spears, nets and dogs. These practices, over the years, have eliminated porcupines from settled areas. If these practices continue, porcupines will be completely eliminated from the face of the earth.

Illegally hunting for porcupine meat is a serious challenge especially in Asian countries. There are superstitions tied to the alleged qualities of the meat and these have resulted to the relatively vulnerable mammal being a frequent target for poachers. Porcupine meat is believed to possess health related benefits. There are claims that porcupine meat cleanses kidneys and increases fertility. Wildlife experts say that rampant killing of porcupines

could lead to them being labelled endangered soon.

Excessive hunting has been cited as the porcupine's greatest threat, and the 1990s saw a reported population decline of at least 20 per cent. Commercial farming of porcupines encouraged by Southeast Asian governments is also another contributory factor as it is actively fuelling the illegal hunting. Research from the University of East Anglia, published in *Biological Conservation*, has shown that the continual consumption of the South East Asian porcupine (*Hystrix brachyura*) as a delicacy is having a devastating effect on wild populations.

In an article by Peter Yeung (2019), another important factor which is likely to lead porcupines to become extinct is the stomach content. In Southeast Asia, porcupines are being poached for their stomach content, an onion-shaped mass of undigested plant material in their gut known as bezoars. Demand is being predominantly driven by China following some beliefs that bezoars, which accumulate in the digestive tract, have potent medicinal properties, including the ability to cure diabetes, dengue fever, and cancer. This is despite the fact that there is no scientific evidence to validate any curative properties of bezoars. The Philippine porcupine, the Asiatic brush-tailed porcupine, and the Malayan porcupine, which live throughout Southeast Asia, are all flagged as threatened and declining in number by the International Union for Conservation of Nature (IUCN).

Although no porcupine has been listed as endangered yet, continuation of these practices may drive them towards becoming endangered or extinct. It is therefore imperative to employ robust measures to protect this rare mammal for the benefit of future generations.



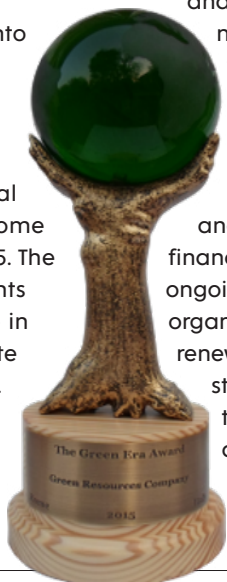
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In recognition of its efforts, GRC scooped the International Global Green Era Award in Rome (Italy) on the 27th of July 2015. The coveted award further cements GRC as a global powerhouse in environmental, energy, climate and sustainability consulting.

The Green Era Award – One of the international accolades attained by Green Resources Company



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RENEWABLE ENERGY SOLUTIONS

GRC solar power solutions are equipped with remote monitoring devices that can be viewed online. We are proud to be using only proven technologies from trusted suppliers and manufacturers. We have also found value partnering with leading internationally recognized and respected companies. Quality is part of our culture and we prioritise high quality installations led by experienced experts.

We constantly evaluate potential markets and new technologies and establishing new business relationships within the sector as the renewable energy market continues to expand.

GRC oversees every phase of the development process - including site selection, project development and design, facilitating project financing, construction, installation, and ongoing maintenance. To date, the organization has carried out a national renewable energy market and feasibility study (peri-urban, rural and urban) that was financed by SNV and HIVOs, designed and installed solar home systems for over 100 households, installed and designed to the

tune of 250kw (combined) commercial solar systems and in partnership with W Giertsen Germany. We also implemented Solar for Health Projects funded by UNDP, where four District hospitals were connected with 40Kw Solar systems. GRC is registered with Procurement Regulatory Authority of Zimbabwe (PRAZ) as a preferred supplier of solar energy solutions and is also a member of the Renewable Energy Association of Zimbabwe (REAZ).

ENVIRONMENTAL MANAGEMENT SOLUTIONS

Our Environmental Management Solutions Division offers consultancy services to industries, NGOs, CBOs, Government departments, miners, power developers, infrastructure developers, water infrastructure development projects, farmers and property developers etc. The aim of the services is to identify the environmental, social, and economic impacts of development projects, so that damage can be prevented and mitigation action taken. GRC offers Environmental and Social Impact Assessment (ESIA) services to clients that legally require the study.

We have carried out assessments on various projects in the country that require EIAs, including mining, construction (roads, buildings, bridges, power generation etc) telecommunication, electricity distribution lines and other projects that have got significant impact to the environment.

GRC has carried out over 200 ESIA's since its inception. Some of its leading projects include: 150 base stations, 15 housing infrastructure developments, 420MW (combined) solar power generating projects, transboundary electricity transmission lines, mining projects, environmental impact assessment notification for Zambezi Transnational Water Project (a project that intends to abstract water from Dete to Zimbabwe and distribute it to Mozambique, Botswana, S. Africa, Namibia and Zambia). GRC in partnership with Outrun carried out an ESIA for the National Matebeleland Water Project, (a project which aims to abstract water from Dekamouth Zambezi to Bulawayo).

Green Resources Company is a member of the Environmental Professional Council of Zimbabwe (EPCOZ), member of Business Council for Sustainable Development of Zimbabwe (BCSDZ)

and registered with Environmental Management Agency (EMA) as an Environmental Impact Assessment (EIA) Consultant.

AGRIBUSINESS SOLUTIONS

Green Resources Company works with smallholder farmers, peri-urban farmers, urban farmers and other institutions to set up sustainable smart agriculture projects. Climate change adaptation is the major focus of the trainings. We offer training in oyster mushroom production, food processing (solar drying), fish farming, horticulture and we provide market linkages for farmer's produce. The division also offers micro-irrigation technology for small holder farmers and solar water pumping, and landscaping services.

GRC WISHES AND ASPIRATIONS

GRC is looking forward to see a global economy driven by green energy,

where everyone is a steward of the environment and has access to healthy food. We aspire to see a prosperous world where a green economy is the foundation of Inclusive and Sustainable Socio-Economic Development.

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By Tawanda Collins Muzamwese

CHEMICALS PLAY A PIVOTAL ROLE IN THE DEVELOPMENT OF ECONOMIES WORLDWIDE. MORE THAN 100 000 CHEMICALS ARE KNOWN AND WORK IS UNDERWAY TO DISCOVER MORE CHEMICALS. However, chemicals are associated with toxicological effects on human health, safety and environment. Many people have died due to exposure to chemicals. Flora and fauna has suffered dire consequences of chemical exposure. One of the main causes of the burgeoning chemical crisis has been the business model of paying for chemical quantities. For many years, chemical suppliers have been paid for the volumes of chemicals that they supply to chemical users. This has motivated them to produce and pump more chemicals onto the market. Consequently, there has been no incentive to save chemicals. In recent years, a new world order has been coined, which changes the paradigm of rewarding chemical quantities to one where performance is the cost driver.

What is chemical leasing?

Developed by the United National Industrial Development Organisation (UNIDO), chemical leasing pays for the services and functions of chemicals rather than the quantities supplied. Under chemical leasing, both the supplier and user of chemicals have the same goal of reducing chemical consumption and fostering efficiency. The application of chemical leasing has been demonstrated in electroplating, painting, agriculture, metal finishing and other chemical intensive sectors. Payments have been related to number or units electroplated, unit of area painted, area of land that has been fertilised or fumigated. Therefore chemical suppliers can no longer sit in their laurels and ignore chemical leasing.

How has chemical leasing been received in developing countries?

The implementation of chemical leasing in developing countries started at a lukewarm level as many stakeholders

were not sure whether chemical leasing would take them out of business or not. Furthermore, the traditional approach of materialism and wanting to see stockpiles of chemicals became a hindrance to adoption. Lack of technical capacity to implement chemical leasing was also a major challenge. However, concerted efforts by development partners such as UNIDO, National Cleaner Production Centres (NCPCs) and private sector companies enabled chemical leasing to gain global relevance. Many developing countries started to adopt chemical leasing after seeing it being demonstrated in other organisations and those organisations reaping the practical benefits of chemical leasing. Early sceptics have been quashed by the quintessential evidence that chemical leasing makes business sense.

Why do big chemical companies dread chemical leasing?

Leading Sub-Saharan Africa consulting experts, Toxiconsol t/a African Sustainability Consultants carried out research and interviews with some major chemical suppliers in order to find out why they struggled at first to embrace chemical leasing. Many reasons were cited including the following:

- "There is a belief that chemical leasing will take chemical companies out of business"
- "There is a belief that the business benefits of chemical leasing take a long time to be achieved"
- "There is concern that in some sectors like food and beverages, altering chemical models could affect food safety"
- "There are fears of chemical leasing leading to loss of jobs in the chemical value chain"

These beliefs remain unproven and are myths that selected organisations have. Through exposure, awareness and training on chemical leasing, these perceptions were changed and more companies realised that they could

run chemical leasing alongside other service portfolios related to chemicals management. Realising that large chemical manufacturers can no longer rely on bulk chemical suppliers, there has been a shift in the way of doing business. Due to increased awareness on sustainable development, green consumers are no longer rewarding chemical companies for the bulk of their chemicals but for the functions of the chemicals.

Case Studies of chemical leasing in Zimbabwe

In Zimbabwe, chemical leasing is in its infancy in most industrial sectors. In the year 2020 two training workshops have been carried out in Zimbabwe to sensitise stakeholders about the importance of chemical leasing and how it can be implemented. Through this interaction, a leading paint company has embarked on chemical leasing and is being paid for the area painted instead of the amount of paint supplied. The company is the first in Zimbabwe to adopt chemical leasing in its service portfolio.

The organisation has implemented chemical leasing for its commercial and residential clients, where clients no longer have to pay for the volume of paint supplied but for the area covered. The paint manufacturer from Zimbabwe is maintaining ownership of the paint whilst driving efficient utilisation of the chemical paint. It is hoped that other paint producers can also follow suit and gain practical experiences of mainstreaming chemical leasing in their operations. Another case study from Zimbabwe is the payment of cleaning services based on the area that has been cleaned instead of the paying for cleaning chemicals.

What policies and strategies are required at national level to steer chemical leasing forward?

In order to drive the implementation of chemical



leasing forward, there is need for adequate policy support and strategies that result in scaling up. Although demonstration projects have been done in different parts of the world, they remain anecdotal. Proper policy interventions are needed to steer chemical leasing. Among the mechanisms that can be implemented include Safe Chemicals Management Policies that have stronger regulations on chemicals. This will ensure that companies find chemical leasing relevant. It is also necessary to include chemical leasing in national laws.

From a policy perspective, countries must avoid subsidies on chemicals such as industrial chemicals, fertilisers and other chemicals. These subsidies lead to the proliferation of chemicals and discourage the efficient utilisation of chemicals. It is very difficult to promote chemical leasing when there are subsidies on chemicals. The true cost of chemicals and the externalities caused by chemicals should be laid bare in order for stakeholders to start taking chemical leasing seriously.

Awards such as the Global Leasing Awards also help to raise awareness on chemical leasing. These awards should also be done at national level in order to ensure that chemical leasing is scaled up.



ZIMBABWE MAKING TREMENDOUS PROGRESS IN MANAGING CLIMATE CHANGE IMPACTS

By Wallace Mawire

ZIMBABWE HAS MADE TREMENDOUS PROGRESS IN THE MANAGEMENT OF CLIMATE CHANGE IMPACTS AND REDUCTION OF GREEN-HOUSE GAS EMISSIONS, ACCORDING TO A RECENT STATEMENT RELEASED BY THE MINISTRY OF ENVIRONMENT, CLIMATE, TOURISM AND HOSPITALITY INDUSTRY AND SHARED WITH VARIOUS STAKEHOLDERS.

According to Mr Elisha Moyo, Principal Climate Researcher in the Climate Change Management Department of the ministry, despite the progress made, gaps and opportunities still exist and further work is required to achieve climate resilience, follow a low carbon development pathway and achieve compliance with global and regional environmental obligations such as the Nationally Determined Contributions (NDCs), as well as achieving the country's developmental aspirations.

Mr Moyo made the remarks in a recent call for input by the ministry for new Green Climate Fund (GCF) readiness activity areas, revised GCF country programme draft and call for information on GCF proposal and concept note development for projects.

Mr Moyo is the Climate Technology

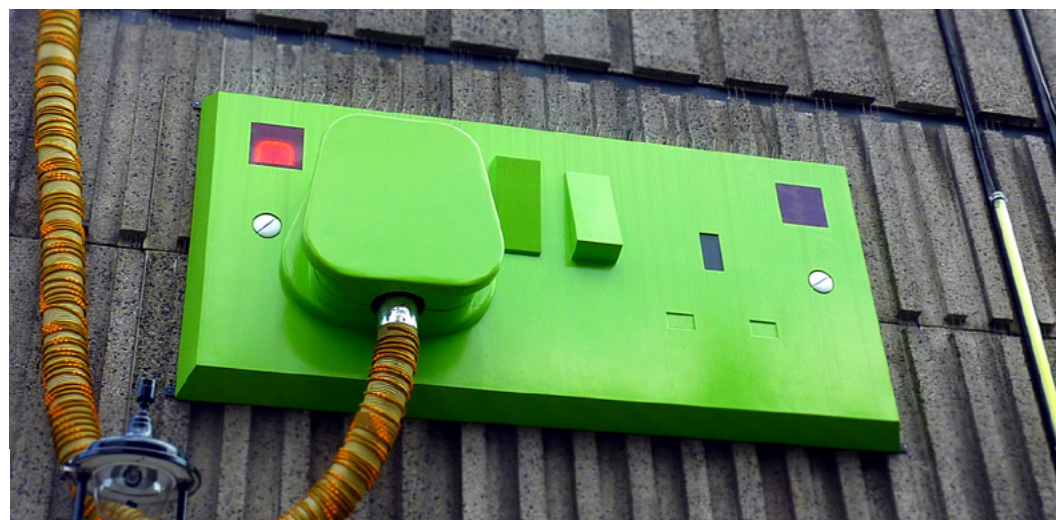
Centre and Network (CTCN) National Designated Entity (NDE) and GCF Alternate National Focal Point contact person in the country.

The Green Climate Fund National Designated Authority is calling for input which will shape the country's readiness project and GCF country pipeline.

It is reported that Zimbabwe has been accessing various forms of climate funds including readiness funds from the Green Climate Fund. The country also intends to utilize its readiness quota in a programmatic approach for the next three years.

The responsible ministry says that important capacity gaps remain for the implementation of the country programme and successful engagement of Zimbabwe with the Green Climate Fund and other climate funds.

It is added that on a yearly basis, the National Designated Authority (NDA) will update the national priorities through a consultative process coupled with a gap analysis for climate change interventions in both mitigation and adaptation. It will then communicate its priorities to the Accredited Entities (AEs) active in the country and share it with stakeholders. The Accredited Entities are the implementing



entities that act as a country's programme managers of the fund grants. It is reported that this will enable avoidance of duplication and enhance coordination among actors in the country.

The Country Programme, a five-year strategic document for engagement with the Green Climate Fund (GCF), was developed for the Government of Zimbabwe through funding from the Green Climate Fund Readiness and Preparatory Support Programme.

The country programme provides a springboard for strategic projects of national importance for funding to the GCF and support the country's economic transformation.

Average annual temperature has increased by more than 1°C in the past century and evidence points out that climate is a major driving factor for most of Zimbabwe's socio-economic activities, especially in the energy and agriculture sectors, such that Gross Domestic Product (GDP) is closely linked with rainfall patterns.

Climate change hazards exacerbate poverty, food insecurity, malnutrition, water shortages and environmental degradation among other developmental challenges, which threaten to derail the development strides made by the Government of Zimbabwe since independence.

The country's Nationally Determined Contributions (NDCs) clearly articulate the country's ambition to reduce greenhouse gas (GHG) emissions by 33% by 2030, with the energy sector leading in mitigation efforts and agricultural sector leading in adaptation.

The country has also developed the Low Emission Development Strategy (LEDS) to broaden the mitigation targets across sectors and support the development of projects for funding from the Green Climate Fund.

The Green Climate Fund (GCF) is a global fund created to support the efforts of developing countries to respond to the challenge of climate change. It aims at supporting the implementation of the Paris Agreement.



The GCF helps developing countries limit or reduce their greenhouse gas (GHG) emissions and adapt to climate change. It seeks to promote a paradigm shift to low-emission and climate-resilient development, taking into account the needs of countries that are particularly vulnerable to climate change impacts.

A fundamental principle of the Green Climate Fund is that developing countries have ownership over the results of the projects and programmes financed using GCF resources (Country Ownership Principle). In this sense, each country must set its national priorities and present its strategy for engagement with the fund through a Country Programme. To receive GCF funding, countries are requested to develop so called "Country Programmes" outlining

the needs of their country under climate change and how the funding will be used to address these needs, both in terms of mitigation and adaptation.

Cognizant of the urgency to act in addressing the challenge of climate change, in 2013, the Government of Zimbabwe established the Climate Change Management Department as well as several policies and strategies to address climate change.

It is reported that the country's total greenhouse gas (GHG) emissions contribute less than 0.05% to global emissions, making it a low emitter (Zimbabwe's Nationally Determined Contributions), yet the country has suffered the brunt of climate change in recent years.





GLOBAL SOCIAL MEDIA PRESSURE MOUNTS ON CLIMATE ACTION

By Tendai Keith Guvamombe

Unpredictable weather patterns across the globe have become a centre of concern among environmentalists and members of the public.

Despite the COVID-19 pandemic gripping the world, a number of environmental groups have shown resilience and continue to encourage the implementation of climate mitigation and adaptation. Youth involvement in climate actions cannot be underrated.

The current lockdowns worldwide, have presented avenues for new modes of climate action. This has seen climate activists launching virtual campaigns in spite of a global pandemic.

Gone are the days when participants used to wait for invitations to attend Global Climate Conferences in foreign lands. Professionals and seasoned players in the environmental sector were amongst the first to embrace the world of virtual conferences.

Therefore, the shadow picture of a global disaster has given birth to innovative minds. The conversations, debates and awareness campaigns being held via online platforms have ignited environmental cohesion among climate change activists.

Twitter campaigns have been vibrant in heralding climate change awareness. Momentum that has been gathered, is starting to yield more results toward the environmental sustainability.

Climate Reality posted on its microblogging twitter account about the effects of heat waves and veld fires in the Arctic.

@Climate Reality "Why it's so damn hot in the Arctic right now? Siberia's three-digit heat wave and wildfires are a glimpse into the future of the Arctic."

Concurrently, Earth Day Network raised a flag on the sudden increase of temperatures in polar regions. Geographically, polar regions are known for extreme cold temperatures due to their distance away from the equator where there is limited intensity of the sun's rays.

Climate Change has broken all the usual weather patterns at the polar regions including drastic shifts from extreme cooler conditions to unprecedented hot patterns.

The opposite has started to transpire at the Congo Basin as the rain forest is reportedly suffering from climate change. Naturally the Congo rainforest is known for torrential rain weather patterns all year round due to the existence of Inter Tropical Convergence Zone (ITCZ). However, current trends taking shape at the equatorial region are affecting the vitality of the rainforest.

These climate change updates frequently posted on different online social media platforms, are a testimony on how individuals now view climate reality. An increased number of stakeholders are taking to social media platforms to spread the message on climate change.

African youths in the fight against climate change have played a significant role in raising awareness on climate issues during the current lockdown periods. In an interview with Jean Mhandu, Africa's Regional Director for Earth Day Network said he has managed to gather momentum on climate change awareness despite COVID-19 setbacks. He sees the relevance of digital platforms in enhancing climate ambitions.

"To ensure everything does not completely stop, especially our efforts to combat climate change, which will likely to impose such pandemics or worse in the near future, we have taken action to educate most people through social media platforms."

"We are conducting several Webinars on many environmental topics including climate change and COVID-19, learning about global action to combat climate change."

The ongoing virtual campaigns can be viewed as a stepping stone towards climate actions.

Increased climate action across the globe will possibly push countries under Paris Agreement on Climate Change to update their Nationally Determined Contributions (NDCs). Climate pledges will see nations working round the clock on global emissions reduction through mitigation.

As the number of individuals who become connected to internet across the world increases, there is a greater potential of reaching out to billions of people in order to raise awareness on both climate mitigation and adaptation.



HUMAN WILDLIFE CONFLICT ESCALATES – AS INTEGRATED CONSERVATION AND DEVELOPMENT PROJECTS TAKE SHAPE

By Diana Tapedzanyika

ZIMBABWE IS ENDOWED WITH ABUNDANT NATURAL RESOURCES INCLUDING WILDLIFE RESOURCES OF ALL KINDS. IT IS FAMOUSLY KNOWN TO BE A WILDLIFE DESTINATION FOR THE BIG FIVE (ELEPHANT, BUFFALO, LEOPARD, RHINO AND LION). WILDLIFE PLAYS AN IMPORTANT ROLE IN THE GROSS DOMESTIC PRODUCT (GDP) OF THE COUNTRY THROUGH TOURISM, A KEY SECTOR OF THE ECONOMY. DIRECTLY AND INDIRECTLY, TOURISM CONTRIBUTES TO THE LIVELIHOODS OF LOCAL COMMUNITIES LIVING IN AND AROUND WILDLIFE AREAS.

For these local communities, not all is rosy as they have to pay the price of living with wild animals. The way a tourist perceives wildlife is different from how a local person views it as they are constantly in conflict with wildlife. In the perspective of a local person, living with wildlife might be a nightmare because most wildlife can cause environmental damage, destruction of property and livestock

as well as disrupting agricultural fields of local people. This is a phenomenon commonly known as Human-Wildlife Conflict. In addition, wildlife poses safety risks to human beings who can be killed when they encounter some of the wildlife species. Many stories have been told of people who have been killed by some wildlife species or have been trampled to death.

Human-Wildlife Conflict is not only a problem in Zimbabwe, but also a challenge in many parts of the world. It occurs when there is coexistence of humans and wildlife sharing the same space and resources. There tends to be conflict because the needs and behaviour of wildlife negatively impacts on human goals resulting in inter specific competition for shared resources. It was then recognized that due to this conflict, local communities must have a share of the resources and also benefit from the wildlife in their

area in order to minimize the impacts of HWC on household income and increase the tolerance of people towards wild animals. One way of achieving this is through Integrated Conservation and Development Projects (ICDPs) also commonly referred to as Community Based Natural Resources Management (CBNRM).

ICDPs aim to make communities bearing the costs of living with wildlife actually gain a sense of ownership of the resource through benefiting both indirectly and directly therefore recovering losses of property from HWC. An example of ICDPs is CAMPFIRE and the goal of this initiative is to increase the tolerance of communities by changing their attitude to be more favourable by supporting certain levels of conflicts. It also seeks to get local communities to actively participate in the conservation and management of the natural resources in their areas.

However the success of these CBNRMs initiatives has been highly contested.

Over the past years, there has been an increase in HWC as a result of the exponential population growth of both people and wild animals, agricultural expansion. The increase of HWC has been the major deterrent for CBNRM because the amount of damage and destruction of property caused by wild animals now far exceeds the benefits accrued from the projects. A new menace called climate change has also come to the party, adding more stress to the already overburdened CBNRM programme.

Climate change is fast becoming a catalyst in the encroachment of wildlife habitats by humans and vice-versa. The shifting of seasons as a result of climate change is negatively affecting agricultural activities and production. Decreased agricultural production increases human dependency on natural resources, which leads to encroachment into wildlife habitats by human beings, thereby increasing HWC.

The decline in the natural resources base intensifies competition between people and animals. Climate change affects local economies of communities, leading to poverty and poverty increases illegal activities such as poaching and poaching increases risks to wildlife attacks which increases cases of HWC. Lastly, the increased frequency of extreme weather conditions such as flooding and drought can result in the migration of people towards protected areas where resources such as firewood are readily available. Some scientists argue that climate change can

reduce HWC as it causes death of a lot of animal species through increased extreme weather events. However, other studies have proved that climate change has a big hand in the increase of HWC.

Climate change adaptation in Zimbabwe has been focusing mostly on agriculture, yet a significant portion of districts in agro-ecological regions not suitable for agriculture, rely on wildlife as a source of livelihood. It is now being recognised that natural resources play an important role in the livelihoods of rural communities. Therefore, adaptation projects are now being extended to cover natural resources such as Non-Timber Forest Products (NTFPs).

An example of such initiatives is the Zimbabwe Resilience Building Fund projects aimed at enhancing the adaptive capacities of rural communities through commercialization and utilization of NTFPs. Such projects need to be extended to wildlife based areas.

ICDPs are under threat from climate change through the increase in HWC. Therefore there is an urgent need to come up with innovations which are aimed at increasing the adaptive capacity to prevent the collapse of CBNRM in areas in which local economies are dependent on wildlife. We must be proactive now rather than being reactive later, if we are to prevent further damage from being done.

Balancing the needs of humanity and wildlife is essential in order to strike a peaceful co-existence. In the quest for sustainable development, there is an urgent need to address Human Wildlife Conflict.





SPECIAL FEATURE: BIRDS OF ALL KIND

By Diana Tapedzanyika
Photos: Green Records Company

THE COEXISTENCE OF HUMANS AND NATURE IS SAID TO OCCUR IF HUMANS LEARN TO LIVE IN HARMONY WITH NATURE BUT WHAT DOES LIVING IN HARMONY WITH NATURE MEAN? ARE HUMANS ABLE TO LIVE IN HARMONY WITH NATURE?

The plethora of challenges being faced by the world today such as climate change, biodiversity loss, deforestation, land degradation, waste, global warming could be a clear indication that human beings are failing to live in harmony with nature as they have left a massive trail of destruction on the natural ecosystems. Environmental activists purport that in this complicated relationship between humans and nature, humans are more dependent on the latter and nature can actually function without humans because it has always regulated itself.

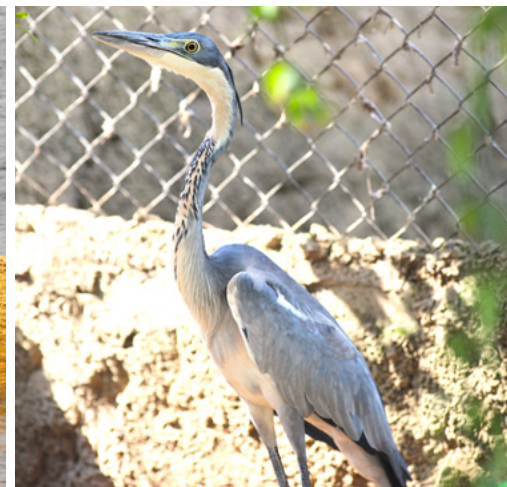
The interference of humans in natural

ecosystems has compromised the ability of nature to regulate itself by offsetting some of nature's natural processes. One way we are doing so is by causing the loss of biodiversity, in the process causing the extinction of keystone species which play a very critical role in the ecosystem. Anthropogenic factors are the single leading cause of biodiversity loss in the world and even the winged inhabitants of the sky have not been able to escape and save themselves from the reach of humans. In this issue under the Birds of All Kind section we focus on Vultures also known as Nature's Clean-up Crew as we build momentum towards the International Vulture Awareness Day (IVAD). The International Vulture Awareness Day (IVAD) is commemorated globally on the first Saturday of September every year. This day has been set aside to raise awareness on vultures across the globe and conservation efforts of a species

whose population has been drastically dwindling over the years. According to Birdlife Zimbabwe, Vultures are the most threatened bird species and their greatest threat being humans.

Vultures are one of the least celebrated bird species whose presence in the ecosystem can be hardly recognised but absence can be greatly felt.





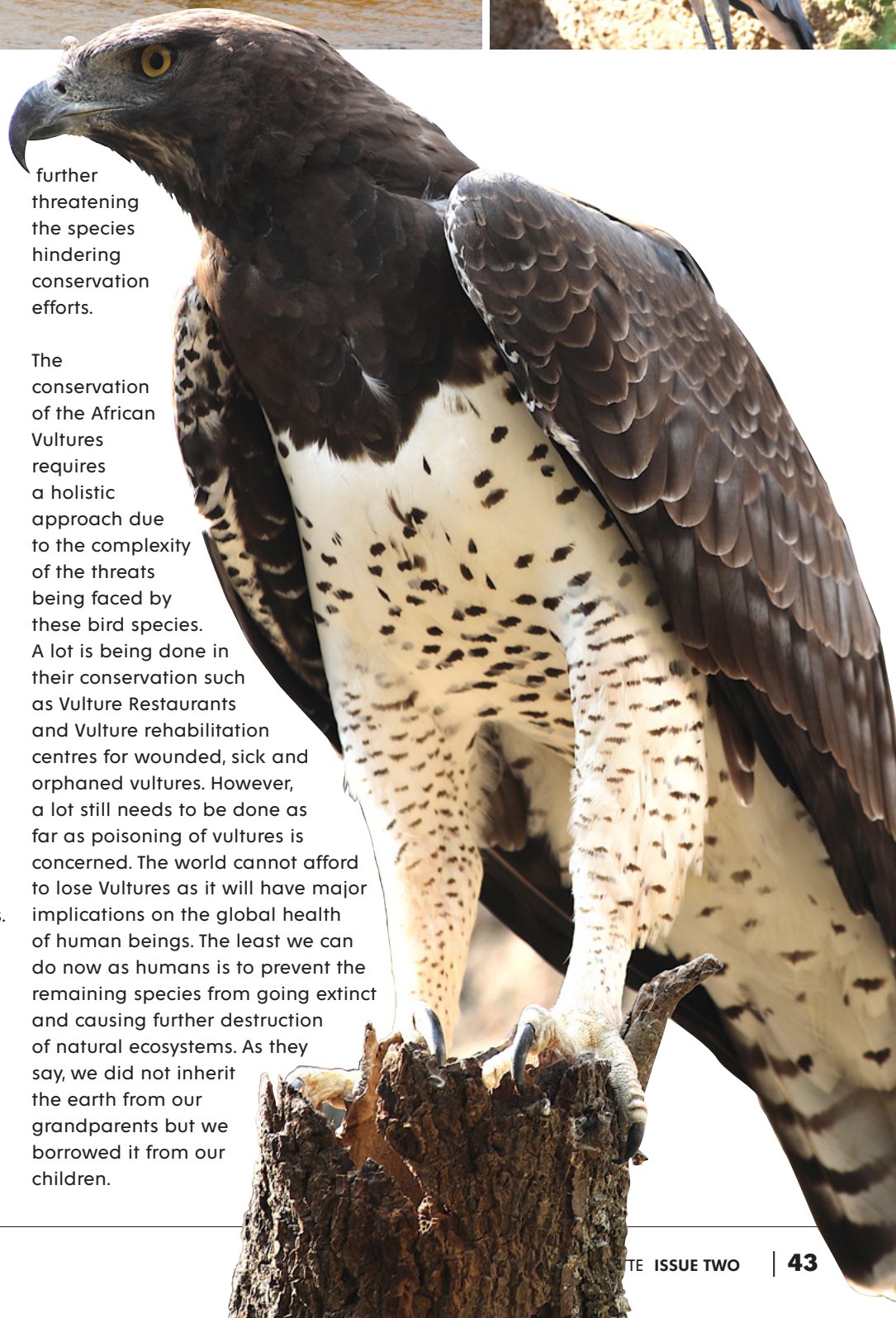
They play a very important role in keeping the natural ecosystem clean thereby safeguarding the health of the ecosystem. Vultures also prevent the spread of lethal diseases such as anthrax, cholera, rabies and Botulism. There are 23 species of vultures found in the world and of these species, 11 species are found in Africa. Vultures are Critically Endangered birds in Africa with 7 vulture species listed as Critically Endangered birds under the IUCN Red List. Zimbabwe is home to 6 species of vultures namely Lappet-faced Vulture, White-backed Vulture, White-headed Vulture, Hooded Vulture, Cape Vulture and Palmnut Vulture.

Their numbers have been declining, with populations in Africa said to be decreasing at a very alarming rate of over 80%, putting them in a grave danger of extinction. The leading cause of vulture deaths is deliberate and unintentional poisoning by poachers. One poisoned elephant carcass can kill up to hundreds of vultures at the same time. Vultures have been found after feeding on poisoned elephant carcasses. Electrocution by electric poles, use in traditional medicines and habitat loss are also other causes of the declining numbers of vultures. The death rate of these species far exceeds the birth rate.

Banning of commercial trade of the species can also increase the demand of the species on the global market which in turn fuels poaching of vultures

further threatening the species hindering conservation efforts.

The conservation of the African Vultures requires a holistic approach due to the complexity of the threats being faced by these bird species. A lot is being done in their conservation such as Vulture Restaurants and Vulture rehabilitation centres for wounded, sick and orphaned vultures. However, a lot still needs to be done as far as poisoning of vultures is concerned. The world cannot afford to lose Vultures as it will have major implications on the global health of human beings. The least we can do now as humans is to prevent the remaining species from going extinct and causing further destruction of natural ecosystems. As they say, we did not inherit the earth from our grandparents but we borrowed it from our children.



DIAPERS POSE A HEADACHE FOR LOCAL AUTHORITIES

THE BABY BOOM BRINGS EXCITEMENT TO PARENTS AND THOSE AROUND THEM AS THE SIGN OF VITALITY AND EXPANSION OF GLOBAL PROGENY. GLOBAL POPULATION IS CURRENTLY 7 BILLION PEOPLE AND ESTIMATED TO GROW TO 9 BILLION PEOPLE BY THE YEAR 2050. All of us at some point went through the diapers and nappies stage as part of our stages of development in life. However, diapers are associated with significant environmental pollution and generate solid waste.

Countries across the world are being encouraged to develop ways in which to make diapers not become a menace to society as well as a global health risk. Disposable diapers

although they serve a convenient purpose, they can be a menace to municipalities and communities if they are not properly managed. In some cases these diapers are being burnt at uncontrolled dumpsites.

Diapers can generate ozone depleting substances during their decomposition processes. The main concerns have been due to the generation of plastic waste which is a key material in the modern day diapers. Traditional mothers in a few decades ago, used to have reusable or washable nappies. However due to hygienic concerns and global innovation, disposable ones have become more popular in many countries.

There is a serious risk of environmental contamination as a result of faecal matter. This unsavoury reality also brings to the fore the possibility of groundwater being contaminated.

Emergence of alternatives include the following:

- Washable cloth nappies
- Biodegradable diapers

The reusable diapers also come with their cost to the environment including a high water and carbon footprint. As manufacturers and researchers battle to come up with sustainable options, it is essential to ensure that those who currently use diapers, dispose them in an environmentally friendly manner.

GREEN PURCHASING A NEW NORMAL OF DOING BUSINESS

EVERY DAY, CONSUMERS ACROSS THE WORLD, MAKE COMPLEX PURCHASING DECISIONS BEFORE ULTIMATELY PARTING WITH THEIR HARD EARNED CASH. MANY FACTORS DRIVE THE DECISION TO BUY. CHIEF AMONGST THEM INCLUDE PRICE, QUALITY, AVAILABILITY AND DELIVERY TIME. FACTORS FOR SELECTING PRODUCTS AND SERVICES ALSO VARY DUE TO DIFFERENT PREFERENCES AND TASTE.

The growing list of factors considered by customers is also now including environmental sustainability. A new generation of green consumers are starting to question the sustainability of a product before they can purchase it. The so called, "Green Consumers", are interested in buying products which are

not only cost-competitive but also environmentally sustainable as well.

Businesses which ignore environmental issues in their production processes risk facing product boycotts. Banishment from global supply chains has also happened for businesses which ignore environmental sustainability.

Green purchasing can be implemented by individuals, private companies and public sector entities. This entails coming up with a criteria for selecting products and services. Many companies are including environmental criteria in their purchasing decisions. Greening the supply chain can

ensure that environmental impacts are prevented. From a loss control perspective, companies can eliminate environmental emergencies by carefully selecting suppliers to avoid environmental risk.

There are arguments that green products are more expensive than conventional ones. Assessing costs throughout the life cycle provides a clear picture of costs and benefits of green products in order to avoid short term financial thinking. In the long term, eliminating environmental damage in the supply chain could be the solution to the global sustainable development challenges.



GREEN BUILDINGS OFFER PLATFORM FOR RESOURCE EFFICIENCY

BUILDINGS ARE SOME OF THE BIGGEST CONSUMERS OF ENERGY AND NATURAL RESOURCES IN DIFFERENT PARTS OF THE WORLD. Materials used in the construction of the buildings, operation and maintenance of buildings all have an interaction with the environment. From the extraction of sand, mining of iron, processing of steel, production of glass, usage of chemicals for painting, energy consumption during the operation of the building and water consumption by the occupants – buildings have a significant impact on the environment. If this is not managed, it is very clear that development of the world's economy will be littered with scars on our mother earth.

Green Building technologies have emerged as a panacea to the ecological impact of buildings. Green buildings are deliberately designed in a manner that ensures that there is a saving of natural resources. Some buildings are designed with an open plan that ensures that direct sunlight gets into the buildings, thereby minimising the need for artificial lighting. Reduction in artificial lighting saves energy and reduce Greenhouse Gas Emissions. Due to the fact that green buildings save electricity, there is a significant financial saving as well.

Biomimicry is also implemented in selected buildings so that they imitate the marvels of nature in a manner which saves resources. The Eastgate Building in Harare has been designed in a manner that adopts biomimicry and uses

significantly less energy than a building of its size. The passive cooling systems and natural lighting ensure that the carbon footprint of the building is greatly reduced.

Globally, more green buildings are being developed in different parts of the world including a range of the following innovative systems

- Buildings with natural lighting systems
- Buildings with renewable energy technologies (solar, wind etc)
- Buildings which adopt rainwater harvesting
- Buildings which use environmentally friendly materials for their construction
- Buildings which have environmentally sound management of waste infrastructure
- Buildings which are water efficient

Sustainability of buildings can reach a stage where buildings are certified to international standards. Globally, there is an international standard called Leadership in Energy and Environmental Design (LEED). The LEED is a global rating system for buildings. This initiative was developed by the United States Green Building Council. In different parts of the world including Zimbabwe, there is also the emergence of Green Building Councils. These stakeholders continue to play a leading role in promoting green building technologies in both developed and developing countries.

Corporate Social Responsibility (CSR) Programmes – Beyond Greenwashing

GOING GREEN IS A MANTRA THAT HAS GRIPPED MANY CORPORATES IN ALL SECTORS OF THE ECONOMY. FURTHERMORE, CORPORATE CITIZENSHIP HAS TAKEN COMPANIES BY STORM. THIS HAS RESULTED IN MANY COMPANIES IMPLEMENTING CORPORATE SOCIAL RESPONSIBILITY (CSR) PROGRAMMES. AN ASSORTMENT OF CSR PROGRAMMES ARE BEING IMPLEMENTED BY DIFFERENT ORGANISATIONS WITH VARYING LEVELS OF SUCCESS.

Enterprises can implement activities that are in response to their stakeholder needs. True CSR is done with the desire to enhance stakeholder value. It is now common for organisations to develop Stakeholder Engagement Plans as well as CSR Strategies. As more and more companies take CSR seriously, we have to set the precedence for future CSR Programmes to meet global best practice.

Social and environmental concerns are also addressed in CSR projects of companies including human rights, preventing child labour and investing in community projects. Infrastructure development in local communities and enabling inclusion in supply chains are all forms of CSR. Some organisations have built schools for local communities or financed income generating projects for local women. Other CSR projects can focus on vulnerable groups such as orphaned and vulnerable children, women groups and youths. By empowering these groups it is possible to uplift communities and enhance their livelihoods.

Tree planting activities and environmental reclamation projects are also shining beacons of CSR. Other sustainability initiatives are necessary in order to achieve sustainable development.

In its different forms, Corporate Social Responsibility is a type of self-regulation for businesses and it goes beyond meeting the requirements of laws.

There are many cognitions why CSR is implemented by different organisations. Some companies implement CSR from a purely ethical dimension. In some circumstances CSR is implemented based on the need to attain business profitability.

However, in recent years there is also a realisation that some organisations are misusing CSR and misrepresenting facts about their CSR work. This includes but not limited to exaggeration of environmental initiatives. This new wave of corporate mischief is called "Greenwashing". This malpractice involves providing false information regarding the company's sustainability performance. Stakeholders are increasingly wary and able to scrutinise sustainability information provided.

CSR has also transformed from merely being a philanthropic driven initiative anchored entirely on donations to society. What if some donations are not in line with the priorities of the society? Donations, community contributions and any activity to uplift a community should be done with the indulgence of the community in order for it to be sustainable.

Getting into Corporate Social Responsibility merely as a marketing tool does not work. In the long run, companies that are genuine in their pursuit of CSR can get the maximum value from it.

In order for CSR to work, a buy-in at the Board and Executive Level is necessary. In addition, a formal CSR Strategy or Plan is essential to ensure that the programmes are organised. Moreover, a Stakeholder Engagement Plan is necessary in order to determine the needs and expectations of the stakeholders. The leading organisations across the world have developed CSR to a stage where there are able to appoint CSR Managers or CSR Executives. The increased

recognition of CSR at corporate level also means that it is perceived well within the business hierarchy.

Reducing pollution, empowering local communities, incorporating local suppliers, better relations with employees, upholding human rights in the workplace and community engagement are all noble actions towards sustainable development.

If done in a sincere a genuine manner, CSR can improve the approval rating of an organisation and improve its moral standing with its key stakeholders. Holistically, CSR can drive business competitiveness and shareholder value. Interesting topics are emerging in the field of CSR including the need to promote human rights at work as well as eliminating modern slavery.

Firms which ignore CSR or lie about their sustainability performance, stand the risk of being shamed in their own countries. Media attention on environmental injustices has heightened in the last decade to the extent that public exposure is destroying top brands.

Non-Governmental Organisations (NGOs) and Civil Society Organisations (CSOs) are piling pressure on firms to uphold good corporate citizenship. Understanding the power and influence of these non-state actors brings a clear understanding of reality to corporates who may be ignoring CSR. The NGOs and CSOs push for specific "causes" or ethical movements which can drive investors and customers away if corporates ignore them.

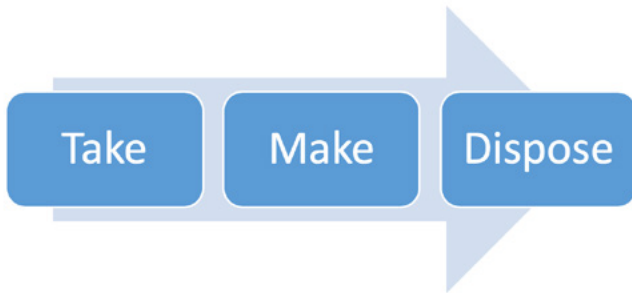
Investors are also beginning to request companies to demonstrate good corporate citizenship in different parts of the world. The lack of CSR plans has resulted in some companies failing to get investments. A new calibre of shareholders is emerging which is demanding accountability to stakeholders.

WASTE TO ENERGY CONVERSION (WTE) A PANACEA TO ZIMBABWE'S ENERGY CHALLENGES

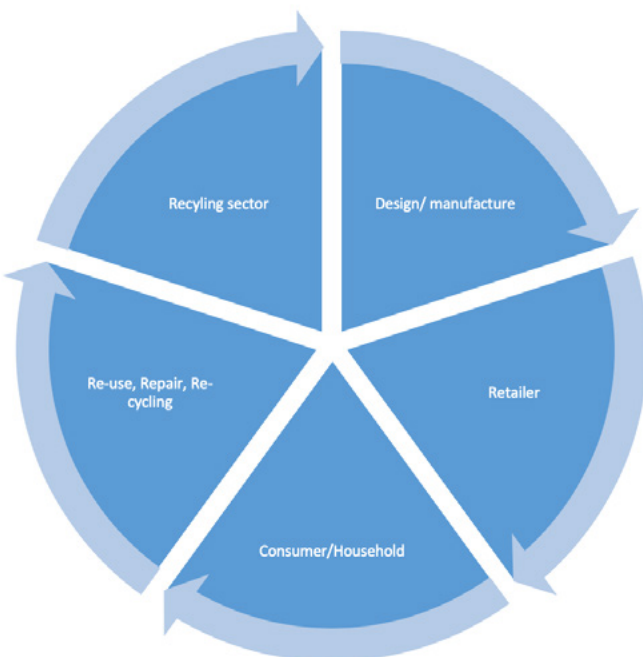
By Freedom Kudakwashe Muranda

SCIENTISTS ESTIMATE THAT ABOUT 2.01 BILLION METRIC TONS OF MUNICIPAL SOLID WASTE (MSW) IS GENERATED GLOBALLY. ACCORDING TO THE WORLD BANK, THIS FIGURE IS EXPECTED TO GROW TO ABOUT 3.40 BILLION TONNES BY 2050. Part of this waste is non-recyclable and can be converted to energy through Waste to Energy (WTE) conversion technologies. These technologies provide a mechanism of establishing a circular economy. The term "circular economy" (CE)

Linear Economy



Circular Economy



expresses a new concept that focuses on maintaining the value of products, materials and resources in the economy for as long as possible, thereby minimizing waste generation (European Commission, 2015). The concept of CE reduces the demand for raw materials. The circular economy aims to correct the misguided means of production depicted by the linear economy. The linear economy is based on "take, make and dispose" philosophy.

The circular economy can be clearly demonstrated by Waste-to-Energy technologies. The process of converting waste to energy involves using modern biological and combustion technologies to recover energy from waste. On average, Zimbabwe is estimated to generate about 1.65 million tonnes of waste in a year in urban areas. Greener technologies involving waste to energy conversion are a positive step for Zimbabwe towards achieving its sustainable development objectives and establishing circularity. Sustainable waste management, energy efficiency and clean energy supply are becoming an imperative and Zimbabwe needs to implement WTE technologies to address these aspirations.

There is a growing need to develop public policies to encourage and support WTE projects. The traditional method of disposing waste at landfill sites is unsustainable and uses up land, contributes to environmental degradation and leads to increased generation of greenhouse gases which contributes to climate change. Waste to energy conversion technologies provide a highly valued source of renewable energy. The greatest benefit of WTE today comes from converting waste into ash, reducing by up to 90 percent the volume of waste going to landfills. Most of this ash can then be used in road construction projects.

Small and medium sized enterprises (SMEs) can use Anaerobic Digestion (AD) to convert waste to energy (WTE). Anaerobic digesters can be developed for energy and thermal energy recovery using briquetting technology. The following initiatives can be developed by various sectors in the economy to adopt Waste to Energy conversion and reduce demand on the national grid in turn reduce Green House Gas (GHG) emissions from the use of fossils fuels to generate electricity. The promotion of energy generation from solid waste by building anaerobic digester facilities to waste recycling centres and institutions requires scaling up. In addition, the use of sawdust for cogeneration of energy and firing of boilers remains a viable option.

WTE is an effective means for sustainable waste management and can be used as an effective supplement to fossil fuel-based power sources. This circular economy based model can generate revenue for municipalities and governments while also reducing landfill requirements in urban environments and generating renewable energy. There are several waste to energy pathways that the industrial sector can adopt to produce electricity, gas for fuel, ethanol, heavy oil and biogas. The following model illustrates the pathways for waste to energy conversion:

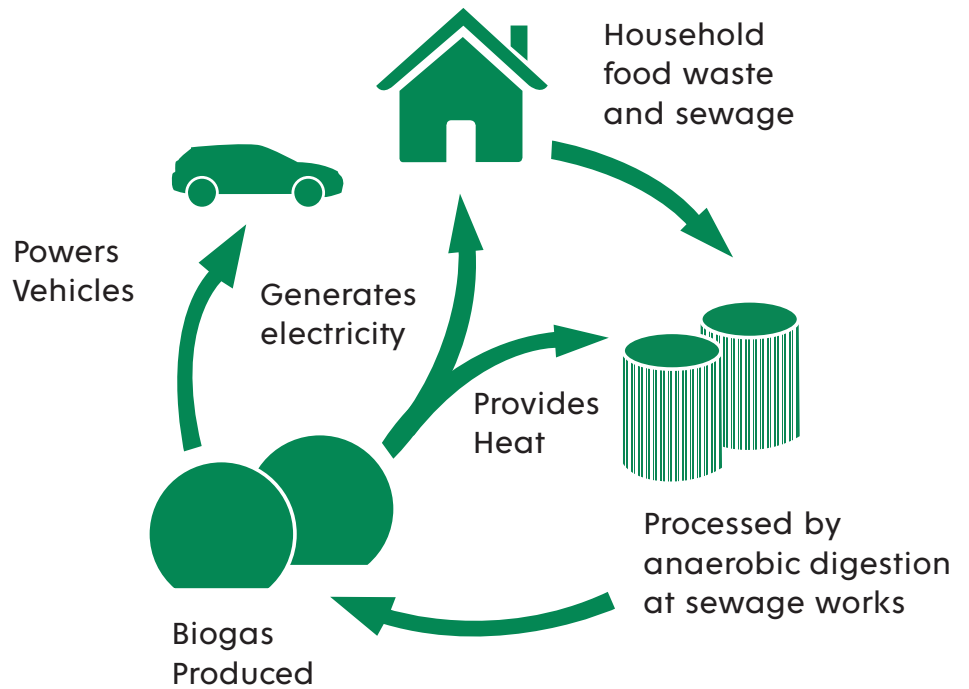


Photo: Green Records Company

Pyrolysis and Gasification

As Solid Waste Treatment Methods

By Freedom Kudakwashe Muranda

AS TONS OF SOLID WASTE ARE BEING GENERATED EACH MINUTE, ENVIRONMENTAL PRACTITIONERS AND MUNICIPAL MANAGERS STRUGGLE WITH WAYS TO SUSTAINABLY TREAT IT. SOLID WASTE HAS BY-PRODUCTS WHICH ARE DETRIMENTAL TO THE HEALTH OF BOTH FLORA AND FAUNA AS WELL AS POSING A RISK OF CONTAMINATION AND POLLUTION TO ENVIRONMENTAL BODIES. THE MOST COMMON METHODS THAT HAVE BEEN USED AND EMPHASIZED ACROSS THE GLOBE INCLUDE RECYCLING, REUSING AS WELL AS COMPOSTING. HOWEVER, WHAT THEN HAPPENS TO THE RESIDUAL WASTE THAT CANNOT BE RECYCLED, REUSED OR SENT THROUGH FOR COMPOSTING?

Landfilling has been an option but there are some disadvantages associated with this process. This include the possibility of leachate contamination of underground water sources and the production of methane with contributes to global warming. Another major disadvantage to consider is that of land coverage. The fear therefore, is that if not managed properly, most arable or habitable lands could end up posing as landfills or illegal dumpsites.

Pyrolysis and gasification are 2 processes that can be used to deal with residual waste. There are more than 100 facilities operating around the world, capable of processing over 4 million tonnes of waste per year. The two processes are options that can be used to recover value from waste by thermal treatment. They are used on carbon-based waste products such as paper, petroleum-based wastes like plastics, and organic materials such as food scraps and they turn wastes into energy rich fuels by heating the waste under controlled conditions.

Pyrolysis and gasification use high temperatures and little oxygen to break down waste containing carbon.



Pyrolysis degrades waste to produce char, pyrolysis oil and synthetic gas also termed syngas. The gasification process then breaks down the hydrocarbons left into a syngas using a controlled amount of oxygen. Syngas constitutes of carbon monoxide and 85% hydrogen, with small amounts of carbon dioxide and methane. It has a calorific value and can be used as a fuel to generate electricity or steam. It can also be used as a basic chemical in the petrochemical and refining industries. The gasification process requires the use of small amounts of oxygen whilst pyrolysis uses none.

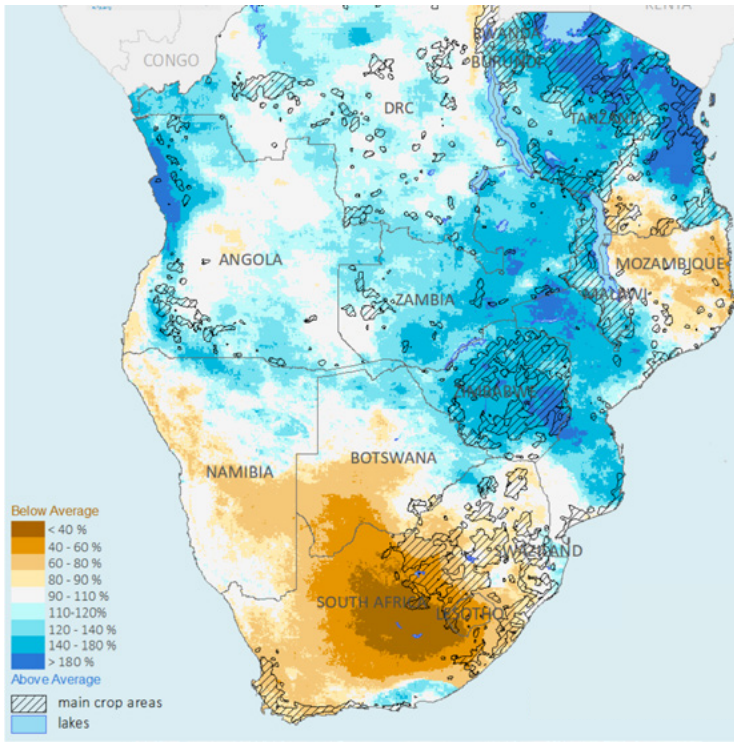
There are a number of advantages associated with the 2 processes. These stand in as a few reasons why pyrolysis and gasification should be considered as waste treatment methods despite the high costs of plant set up. There are increased possibilities for recycling associated with the process. The processes offer more scope for recovering products from waste compared to other waste treatment process such as incineration. The gases, oils and solid char from pyrolysis and gasification are not only used as fuel but can also be purified and used as a feedstock for petro-chemicals. The by-products can be sold to allow for revenue inflow or used onsite and reduce expenditure rates thus making the processes economically viable.

The processes also offer better energy efficiency and contribute to the reduction global warming. This can help achieve renewable energy targets, address concerns about global warming and contribute to achieving Kyoto Protocol commitments. The research for the Community Recycling Network argues however that, it is important to identify which fuel is being displaced by using waste to produce energy. If coal, a greenhouse gas emitter is being replaced then gasification and pyrolysis become viable processes in the context of climate change. However, if a cleaner fuel such as gas and renewable energy sources such as wind and solar is to be displaced, then pyrolysis and gasification would be labelled poor options in terms of climate change. In terms of climate change mitigation, pyrolysis and gasification should be avoided because they divert energy from true renewable sources like wind and wave energy but there still are cases where coal and firewood are still being used as sources of energy. One has to weigh the pros and cons and make an informed decision when it comes to employing the different waste management treatment method.



METEOROLOGICAL SERVICES DEPARTMENT PREPARES TO HOST REGIONAL RAINFALL SEASON FORECAST

By Wallace Mawire



The Meteorological Services Department (MSD) is preparing to host the Southern Africa Regional Climate Outlook Forum in August 2020 to discuss the 2020/2021 rainfall season forecast.

It is reported that the forum will provide a platform where the meteorological and hydrological agencies within the SADC region will come up with a regional rainfall season forecast for sharing with stakeholders in the climate-sensitive sectors.

Previously, the SADC Secretariat through the Climate Services Centre (CSC), which coordinates the Southern Africa Regional Climate Outlook Forum (SARCOF) process, held the 23rd Southern Africa Regional Climate Outlook Forum (SARCOF-23), in Windhoek, Namibia from the 19th to 27th August 2019 last year.

A consensus regional seasonal forecast was issued during the SARCOF-23 and implications for the climate-sensitive sectors were also provided.

The Meteorological Services Department in Zimbabwe on 4 September 2019 then held the National Climate Outlook Forum (NACOF) for the dissemination of the national seasonal outlook for the 2019/2020 rainfall season.

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Second and Third party Inspections



INTERVIEW WITH PETRECOZIM CHIEF OPERATING OFFICER – MR TAWANDA MASUKA



TOWARDS ENVIRONMENTALLY SOUND MANAGEMENT OF WASTE

Environmentally Sound Management of waste is a key pillar in achieving sustainable development. The private sector in Zimbabwe is leading the way in promoting Extended Producer Responsibility (EPR). A clean environment free of land pollution is essential to ensure we build sustainable cities. In this issue of the Green Business Gazette (GBG), we interview the best private sector-led waste management initiative in Zimbabwe, a project being coordinated by PetrecoZim (Pvt) Ltd. This interview was carried out by GBG Editorial Team and the interviewee Mr Tawanda Masuka (TM) (Chief Operating Officer – PetrecoZim), provides deeper insights into the operations of PetrecoZim (Pvt) Ltd.

GBG: Waste management is one of the areas for achieving sustainable development. Can you briefly tell us about PETRECO and the activities that you do?

TM: PetrecoZim (Pvt) Ltd is a company that was set up by some companies in the beverage industry to specifically address the problem of post-consumer (Polyethylene Terephthalate) (PET) bottles pollution. It was registered in 2011, but started operations in 2014. PetrecoZim was set up as a collective Extended Producer Responsibility (EPR) effort by the beverage industry to address an emerging environmental problem premised on achieving industry self-regulation. Other problem waste streams at the time were diapers and kaylite which has since been outlawed due to lack of traction from the value

chain. We have made great strides on the PET front to the extent that it is now a visible industry. A group of leading companies agreed to set up the initiative voluntarily based on international best practice and committed to fund the capitalisation and subsequent subsidies required to support the operations of the company. These companies include Delta Beverages, Schweppes Zimbabwe Limited, Dairibord Zimbabwe Limited (incorporating Lyons), Tanganda Tea Company, Mutare Bottling Company, Coca-Cola Central Africa and MegaPak Zimbabwe. AFDIS joined the initiative at a later stage. Membership was open to the rest of players in industry and remains open to bottlers, converters, brand owners and importers. The key deliverable for the initiative is to reduce the environmental footprint of post-consumer PET bottles in the country. Some of the activities to achieve this mandate are as follows: -

- Collection of PET bottles from the stream
- Conversion of the bottles into raw material for downstream industries, both domestic and export.
- Recruitment and training of waste pickers
- Enterprise development and promotion of recycling
- Researching and being the reference point for all matters PET in the country.

GBG: How are stakeholders viewing your work in waste management and are you getting the support that you require?

TM: As you would expect, waste management is an area that is attracting interest from various

stakeholders and naturally our initiative has not been an exception. Various stakeholders including regulators, local authorities and communities do appreciate the work we are doing. However, the initiative can achieve even a much bigger impact if other industry players that are not participating in this programme and other similar programmes are held to account for their environmental footprint individually. We have a big challenge of "free riders". We believe that the regulator has a bigger responsibility to play in this regard.

GBG: Which waste types do you process at your facility?

TM: We are a specialist recycler focusing only on PET bottles. However, we do have the capacity and competence to handle other solid waste streams such as paper and other plastics without changing anything on our model. We reserve the right to expand our product portfolio should there be a compelling case. In fact, some of our agents countrywide that we support with equipment and expertise, are already handling a diverse product portfolio, which covers a lot of solid waste streams.

GBG: Have you developed any partnerships with the private sector in order to manage and treat waste?

TM: As a private sector founded, funded and governed initiative, the private sector footprint is everywhere on our project. We are by definition an extension of the beverage industry value chain with respect to management of their packaging waste. We are therefore obliged to offer a waste management service to our membership, but we have

been able to offer this service to other players outside our membership. However, we experienced a lot of knowledge gaps during the formative stages of this initiative, being a greenfield project. We have therefore relied on some individual experts in the fields of material science and chemical engineering to develop standard templates for our key production activities and processes. In the end, we managed to achieve ISO 9001:2015 certification in our quest to achieve standards in waste management. We believe this is a first for the industry.

GBG: Your model has been successful in setting the pace on environmentally sound management of waste in Zimbabwe. Do you have plans to scale up and replicate your model?

TM: Upscaling is the next logical thing to do. We have covered a lot of ground in promoting the recycling of PET in the country as our footprint is already national. We are happy that this has by and large been embraced by all communities, providing livelihoods for a lot of people at the bottom of the pyramid. However, in order to achieve long-term sustainability, we believe that local waste beneficiation is the way to go in order to localise employment, create new industries and close the loop. However, this requires more funding as waste beneficiation tends to be more capital intensive as you move down the value chain.

GBG: What challenges exist in the waste management sector and how are you overcoming these challenges?

TM: There are many challenges in the waste management sector. Firstly, the market is very volatile and prone to global economic shocks thereby making the future very unpredictable. This explains why the world over, the sector relies on subsidies from the state, private sector or international organisations to survive. Historically, a lot of businesses in the sector have struggled to come out of adverse economic cycles. There is need for buffer funding to insulate and sustain the industry during difficult times. The sector is also a fertile ground for government regulation, locally and internationally which is a big risk.



We have seen that the Green Fence policy in China and subsequent ban on solid waste streams in 2018 caused a lot of carnage in global waste value chains that relied on China as a market. Closer home, the developments in SA which provides the biggest regional market for recyclables is creating a lot of anxiety in the region. The industry is also subject to market distortions, misinformation and outright cheating. But the major issue perhaps relates to high costs which affect the whole country but are magnified in the waste sector due to lack of infrastructure, incentives and support systems. The ambiguous interpretation and enforcement of legislation creates room for free riders and uneven playing field whose ultimate effect is to undermine noble efforts by other players. It also becomes difficult to enforce recycling standards and best practices across the market when all the market players are not on the same page.

In terms of overcoming these challenges, we are doing a lot. The issue of uneven playing field and free riders is really dealt with at the regulator level. Apart from moral persuasion which hasn't been working, we can only present facts and figures and our views for consideration. We are always engaging with the regulator formally and informally to lobby for certain positions which we feel are critical for the future and growth of the industry.

Right now we have flagged the issue of cooking oil bottles which we believe is a ticking environmental time bomb. We believe that the market issue can be dealt with by developing a domestic end-use market that localises employment and closes the loop. That way, the industry will be somewhat insulated from events and regulations in

other countries. The strategy of exporting waste to other countries on its own is not sustainable, because it's too prone to events happening in other countries which are uncontrollable. The issue of high costs is really up to the individual company's strategy to contain costs.

For us, despite receiving funding from our members, we enforce standard business practices to reduce costs. But while this is noble and imperative, the solution lies in unlocking more funding to ameliorate the high costs burden. We therefore continuously scout for new funding opportunities by growing membership and engaging the donor community for support. But the objectives are not always financial. In actual fact, our key imperatives border on meeting social and environmental targets.

Some challenges to do with designs and recycling standards are dealt with internally at industry level through self-regulation. But in the main, we always share our experiences and expertise at various environmental forums to change perceptions and perspectives, influence policy and lobby for certain positions of interest. Distortions, misinformation and cheating are inherent challenges that are dealt with at a strategic level.

GBG: How are you mainstreaming gender in your operations and value chain?

TM: Fortunately for us, some of our members and partners have gender mainstreaming as part of their performance metrics. The issue of gender mainstreaming therefore becomes a standard reporting item. Our industry is traditionally male dominated but certain sections of the value chain like waste picking have high female concentration.



GBG: Going forward, what message do you have for other stakeholders who are starting up waste management facilities?

TM: The message is very simple. Waste management is not a walk in the park. Aspiring industry entrants should expect to get their fingers burnt. However, there are bigger opportunities in the sector. Waste management is part of the big discussions happening on big forums on sustainability and climate change. This is the industry for the future. Ignore it at your own peril.

Notwithstanding the aforementioned, we do have a deliberate recruitment policy that favours female employees in certain roles. Ordinarily some of our processes such as sorting, weighing and housekeeping are ordinarily manned by women to protect their quota. However, the waste collection space upstream is somehow dominated by women but this is not by our design. We therefore take advantage of the existing situation by encouraging other women in communities to encourage their peers and earn a living through waste collection.



RESOURCE EFFICIENT AND CLEANER PRODUCTION (RECP)

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Intermittent Energy

Batteries & Solar Products



AREAS OF EXPERTISE

Installations

Site Assessments

System Maintenance

Quoting & Bill of Quantities (BOQ)

System Sizing & Resizing

System Upgrades & relocation



1st Floor Angwa city mall next to NMB Bank
Show Room/ Satellite Office: 8 Glenara Avenue, Eastlea, Harare
Contacts: sales@intermittentenergy.org.zw/ magetsikuvanhu@gmail.com

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www.intermittentenergy.org.zw

INTERMITTENT ENERGY PRIVATE LIMITED



“EPC providing Installation, Engineering, Procurement and Construction of Solar PV Energy systems for Residential, Commercial, Industrial and Solar farms”

INTERMITTENT ENERGY PRIVATE LIMITED is a registered Solar Energy system installation company doing things differently in the Zimbabwe market. With a focus on partnership, female empowerment, sweat equity and strategic growth; Intermittent Energy is changing the way Solar Energy business is conducted in Zimbabwe. Intermittent Energy was registered in 2017 and has been actively in existence for almost ten years, firstly as a subsidiary of another company before gaining its own identity in 2012. As of 2013 the company waded through the resistance of solar in society as it gradually solidified.

Intermittent Energy has a focus on creating access to renewable energy and education to as many as those who need it. Intermittent energy believes that renewable energy should not be limited to only those that can afford but should be scaled up through low-cost models. Through this drive, the company was then able to establish itself in the niche market of being the kind of company that not only handled installations of solar products for the end user, but also procurement, design, construction and partnership with larger entities to provide trusted sub- contractual services with the utmost professionalism.

Intermittent Energy is driven by the phrase, ‘Magetsi Kuvanhvu’, meaning power to the people and by this chant, the utmost is done to honor it. In line with this thrust, there has been a drive to provide power to district offices such as Guruve. Similarly, there has been rural installations in Zvishavane, Rusape, Selous, Gweru, Mutare, Murewa, Nyanga, Vic Falls and Hwange coming up.

Intermittent Energy promotes women empowerment. We believe that women should be nurtured, encouraged and given equal opportunity. In line with this trajectory, Intermittent Energy is a strong supporter of the “Pink Hat initiative”. This initiative includes bringing together as many women as possible in electrical work and renewable energy projects to design, construct, supervise, engineer and install fully functional solar PV energy powered systems. Through this initiative, Intermittent Energy is putting

its money in women sincerely. We do not pretend to be supporting women empowerment, but we are purposeful in having women in our installation teams. Our female engineers are fully qualified and competitive just like their male counterparts. Intermittent Energy female engineers have MSc Renewable Energy and have proven ability to design systems, install solar systems and lead project teams.



Intermittent Energy was formally registered in 2018 as an entity and has since grown in leaps and bounds. The organization has entered into strategic partnerships with fellow established brands in the solar industry across the SADC region of Africa. Intermittent Energy conducts solar installations for every section of society and industry. The ability to be malleable enough to do residential installations and Megawatt size solar farm systems. Intermittent Energy conducts site assessments, procurement, system design, structural engineering, construction and installation of renewable energy projects. The equipment and products have warranty and guarantee locally. This ensures quality and peace of mind to our customers.



The vision for Intermittent Energy is to achieve increased synergy with industry as well as attaining diversity. As an organization, we are actively pursuing cooperation with stakeholders in the solar industry as well as improving awareness and support towards community building and development. Intermittent energy is a true Zimbabwean "one step at a time" success story. The organisation was established from the thoughts and hard work of those within the organization resulting in Intermittent Energy's current status and position in the market.

Vision

To Provide affordable electric power solutions with the use of Solar panels, Photovoltaic energy, lithium Ion and gel solar batteries to all those who want it, whilst also doing our best to provide it to those who need it.

Mission

Provide an efficient, effective product and service delivery that ensures the utmost care to detail and professionalism in the installation, design and supply of Solar Photovoltaic products and services for Zimbabwe and its' neighbours.

Values

- Efficiency
- Humility
- Professionalism
- Technical prowess
- Practicality
- Innovation
- Dynamism





Intermittent Energy

Batteries & Solar Products



TECHNICAL CAPACITY

MSc Renewable Energy qualified Engineers (team leaders for large scale systems).

Class 1 electricians (team leaders for average to mid level systems).

6 x installation teams allowing for 6 sites of up to 10 kVa to be active simultaneously.

Pink Hat Initiative for equal opportunity for Women in Renewable Energy.

All teams are employed by Intermittent Energy (We do not subcontract for the sake of looking larger than we actually are).

PS: should there be need for expedited completion on a site or project teams are then collapsed into one and as many as are needed to complete job in the time expected will be made available.

Advisable to ensure that all jobs are allocated before 10 am on day of installation at the latest, this ensures that there is ample time to complete the 10 kVA or smaller on the same day. This is in order to ensure that we as installers are not in the client's personal home space in late evening into night without necessity. For projects we are capable and able with all required personnel equipment.

LONG TERM PLAN

Provide lasting solar PV installation solutions for suppliers and retailers

Produce a level of quality that becomes the standard to be measured upon in installation classification and professionalism nationwide

Mastery of your product list and procedures, to give us an added advantage for both selling points and installation preference in both the market and with your organization for Africa

Become priority level selection for installations, consulting and technical exchange

Become a priority level consideration for specials, bulk sales and promotional pricings

Empowering more women in solar PV industry at all levels from electrical class 1 all the way to MSc/PHD in Renewable energy

Periodically conduct CSR (corporate social responsibility) drives including:

- Donation of total payment to select charities and schools to aide less fortunate
- Donate systems to schools, orphanages and rural establishments that would benefit
- Create employment for locals in locations where projects permit outsourcing of hands on labor teams
- Awareness Campaigns for Solar PV system advantages, basic use and best practices in communities

REGISTERED WITH

ECZ (Engineering Council of Zimbabwe)

ZIE (Zimbabwe Institute of Engineers),

REAZ Renewable Energy Association of Zimbabwe)

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TARGET CHIPUNGU



WHO IS TARGET CHIPUNGU?

Target Chipungu is the founder of Intermittent Energy Pvt Ltd. The organization which he leads, is a leading engineering company that provides renewable energy services to individuals and companies in order to increase their lead time on service provision. Target pioneered the formation of Intermittent Energy Pvt Ltd and has continued to play an active role in catapulting it to excellence at national and regional level. Target holds an MSc in Renewable Energy from University of Zimbabwe, Certificate in Project Management and a Bsc Degree in Industrial Engineering.

TARGET'S PHILOSOPHY

"I love what I do because this type of job involves projects especially residential homes. The joy that a client has when you leave them with access to energy is enough to drive me".

TARGET'S EARLY YEARS

Target Chipungu realized that he had a passion for electrical work in his early days of secondary school when he began to pursue his purpose through seeking exposure at every given opportunity. He then realized he had a knack for electrical work due to his lack of hesitancy. From an early age, Target never exhibited fear when it came to problem solving, assembly and insulation. As a result, it came naturally to him that he had to pursue the relevant qualifications to allow him to fulfil his passion and talent in electrics unencumbered. He went on to be attached at Zimbabwe Power Company Kariba Power Station at a time when the water levels were decreasing.

As an intern, Target always pushed himself to come up with ideas of how to solve the current power situation. He became committed to facilitating a solution-oriented mindset and implementing ideas that would help alleviate the challenge of power supply. He was biased towards renewable energy and has developed keen interest in solar. After completing his

first degree, he decided to embark on a Masters Degree in Renewable Energy, where he further advanced himself in solar PV (photo voltaic) energy. Target consolidated his foothold on the renewable energy sector through networking and working with different stakeholders in the industry.

TARGET PIONEERS THE "PINK HAT INITIATIVE"

During Target Chipungu's internship, a supervisor who was a woman visited him on one occasion to assess progress. The Supervisor was unpleasantly surprised to find that there were only a few women on site. That reaction from her struck Target and he realised that in the energy sector there were very few women taking part and getting involved.

Inspired by this challenge, Target decided to change the narrative by initiating reforms. One of the reforms that he championed include, giving more women a chance to showcase themselves in renewable energy. As a result, Intermittent Energy began to prioritise employing women and incorporating them in the operations of the company. As a company, Intermittent Energy realized that women can be equally faster and reliable in comparison with their male counterparts. As a result, "pink helmet initiative" was born to promote women empowerment in the energy sector. The pink hat initiative is an undertaking where the organisation identifies qualified female engineers, Class 1 rated, with capacity and passion for renewable energy.

Target Chipungu believes that the Pink Hat Initiative is a groundbreaking initiative which should be accelerated throughout the renewable energy industry.

"In some cases, we have expanded our search criteria to also include unqualified female individuals whom we can take through formal training. This has been achieved through our long-standing partnerships with Non-Governmental

Organisations (NGOs). These organizations have databases of women who can benefit from the training that we offer. The training and skills are harnessed for community development as well as creating employment for the newly trained women. The key skills that we teach them are to do with electrical work, solar power installations, solar energy system maintenance and best practices in the industry"

TARGET'S OUTLOOK FOR THE RENEWABLE ENERGY SECTOR

Target believes that the renewable energy sector is growing at a fast pace. However, he notes that the Solar PV energy market to date in Zimbabwe is flooded with organisations and individuals who hold minimal expertise, less qualifications and international exposure. Target opines that most individuals and organisations doing renewable energy work are being led and managed by individuals who do not have adequate technical expertise in renewable energy. He believes that improved capacity building, training and certification are urgently required. His hope is that more companies emulate intermittent Energy, by having adequately qualified active team leaders. Target believes that this endeavor would mean that projects are in the hands of capable and qualified installers, thereby guaranteeing quality service delivery with attention to best practice. His desire is for Zimbabwe and the SADC region of Africa to have 100% to energy, even in what seems the most remote areas.

"For every passion that you have, there is a road to be taken to pursue it. If you do not decide to take that road, do not think that you will still catch up with your passion and succeed" - Target Chipungu

GREEN BUSINESS MAKES PROFITS



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CAN WIND POWER GENERATION SUCCEED IN ZIMBABWE?

by Tawanda Collins Muzamwese

Beyond curiosity – Growing interest on wind power

Although, the wind blows every day in Zimbabwe, is it enough to facilitate commercially viable wind power projects? Global studies are heading towards positive indications of the existence of wind resources for possible commercial development in Zimbabwe. The global recognition of the possibility of wind power development in Zimbabwe gives keen interest to many investors, private sector and policy makers in the field of renewable energy. Having noted the growing interest in renewable energy including wind power, the Green Business Gazette opines that wind power requires evidence-

based analysis of its prospects in the country, backed by internationally recognised methodologies of resource quantifications. This article attempts to explain the dynamics of wind power and affirms the need for Zimbabwe to pursue vigorously the possibilities of wind power in the country as well as carrying out all practicable steps to get closer to yielding wind power at commercial scale.

Role of Energy in socio-economic development

It is widely recognised that Energy is a key enabler of socio-economic transformation in different parts of the world. Dealing with climate change

and global warming demands drastic shifts in the energy mix, including decarbonising our economies from overreliance on fossil fuels. The increased calls for scaling up renewable energy continue to influence its inclusion in the energy mixes of different countries. As Zimbabwe gears itself to fully implement the National Renewable Energy Policy, the potential for wind power generation is a great opportunity to bolster the national energy mix. Many questions have been raised concerning the prospects of generating wind power in Zimbabwe and there is need to answer them once and for all. The Green Business Gazette takes readers through a pragmatic review of the possibilities of wind power in Zimbabwe based on the

scant available evidence and proposes the way forward for urgent studies to either prove or disapprove the existence of commercially viable wind power in Zimbabwe.

Facts about wind power generation

Although wind turbines can start rotating at wind speeds as low as 2 metres per second (m/s), globally it is widely acknowledged that wind speeds of at least 10 – 15m/s metres per second give the most technically and economically viable possibilities of wind power generation, with 15 m/s being the most efficient. When wind speeds are above 25 m/s a braking system may be required to enable the wind turbine to cut out or come to a stall. Wind turbines convert the kinetic energy of the wind into electricity. This process is carried out without generating emissions to the environment. Commercial wind turbine deployment requires millions of dollars to construct and maintain, hence a factual approach to decision making is necessary when investing in wind technologies.

Tacking stock of our wind resources and moving forward

International Renewable Energy Agency (IRENA) estimates that the average wind speed in Zimbabwe is 4 to 6 metres per second. An African Development Bank Wind Atlas estimates ranges of wind energy potential of between less than 4 to 6 metres per second at an altitude of 50 metres. This means that there are good chances of generating wind power in Zimbabwe albeit in specific areas. The wind speed viable for commercial wind power production in Zimbabwe is believed to be mainly concentrated in the Eastern and the Southern parts of the country. Investors must be guided accordingly in the process of determining the locations with the highest potential for wind technology deployment and generation of wind power.

Remote studies should be coupled with empirical studies on the ground to verify the potential for wind power. Although wind power is possible in the locations identified in the eastern and southern

parts of the country, it is necessary to ensure that operation, maintenance and outlets of spare parts are established to deal with all the needs of running the projects throughout the life-cycle. Noise impacts and aesthetic impacts on the landscapes need to be assessed in order to mitigate adverse impacts on the local communities.

The security of Zimbabwe's energy supplies should not be based upon one energy source, but must be based on an energy mix. Solar energy already shows an advanced potential amongst the renewables, but the potential for wind energy should be fully explored. Practical scientific studies to ascertain the level of wind resources for energy generation should be fully supported by development partners, private sector and government agencies.

Public private partnerships will be necessary in order to harness the ability of the country to finance and technically develop wind projects. The potential for wind has been alluded to be present in Zimbabwe by international organisations and early work by ZERO Regional Environmental Organisation. What is left is for the country to scale up validation and further scientific studies to verify the wind resource potential. Time is definitely not on our side in the green energy revolution.

Policy support has been established through the National Renewable Energy

Policy and this needs to be coupled with a scientific approach coupled with green financing framework to finance the technical assessments and move beyond pilots to commercial generation of wind energy.

Investors are not concerned with renewable energy investments without a feasibility study of the technical and business case. This cautious approach is very necessary in order to avoid unnecessary loss of income through investment in projects which are not profitable. It is therefore essential to prove the case for wind technology in Zimbabwe in order to leverage investment. Approaching renewable energy investments from purely an "eco-centric approach" is not ideal as it will result in apathy by the private sector financing facilities which always balance ecological and commercial goals.

Several projects across the world have become dormant when improperly planned and done without proper feasibility. Therefore, the need for data regarding the viability of commercial wind power generation is to a great extent a means of due diligence and cautious approach to green investments. At the same time, we cannot become slaves of our own fears and require a factual determination of the extent of our fears. In certain cases fears can turn out to be foundations of hope. In ascertaining the wind power resource



that Zimbabwe has through tests on the ground; Zimbabwe will be able to end the debate once and for all, rather than contemplate what could be or what could have been. Technological advancement is also progressing to the level where wind energy is being harnessed with lower wind speeds and at a lower cost.

The collaboration amongst stakeholders in industry, research, academia and civil society as well as public sectors is necessary. Zimbabwe has some of the leading researchers, experts including those in the field of renewable energy. Despite the opportunity that exists, we need to see the scientists to contribute to bodies of knowledge and assist in determining whether or not Zimbabwe can invest in wind technology.

A decisive conclusion to the debate is necessary and validation of international studies that propose the existence of wind energy potential should be proved or disapproved. Once this process is completed, stakeholders can consider these inputs in making decisions and also making recommendation on the investment priorities of the country in the renewable energy fraternity in Zimbabwe.

How can this be done?

The wind speed of the proposed site for wind generation can be determined by measuring wind speed on a pole erected at the site where the proposed wind turbine is to be installed. The monitoring should take place over several months in order to determine a pattern and also determine the average wind speeds over sustained wind speeds

What factors will determine and encourage generation of wind power?

Altitude of a place is very important. In areas where wind power is earmarked to be generated it should be noted that the wind speed increases with an increase in distance from the ground. Therefore turbines should be located at higher positions starting from at least 10 metres height minimum. In most countries ranges of 50m to 80 metres are very common.

How reliable is wind energy?

Several project developers and investors are concerned about the intermittent nature of wind power. It can be unreliable at times, depending on the

level of wind at a particular time. Lack of predictability also makes investments risky to make. However, long term studies of wind patterns can allay this fear. The reliability depends on location where the wind project is installed, but there is no definite prediction of how wind patterns manifest themselves in any area.

Are the energy economics of wind power attractive?

The high investment costs in wind turbines are usually the main concern for many investors. With policy instruments, incentives and support infrastructure; wind can be made competitive and economically viable option in the energy mix. Costs have to be considered for installation as well as operation and maintenance. Research carried out by the International Renewable Energy Agency (IRENA) suggests that global costs of installing wind turbines ranges between US\$ 1800/kW to US\$ 2200/kW when installed onshore and US 4500/ kW when installed off-shore. In the case of markets such as Zimbabwe, the cost is lower as it is onshore, rather than offshore installation. There are also costs associated with operation and maintenance of wind turbines. These range from US\$ 0.01 to \$ 0.025/KW. As technology, research and development advances, we are likely to see a fall in the costs of wind technology. As the costs fall, there will be increased chances of wind energy investment in Zimbabwe.

How do we finance wind projects in Zimbabwe?

There are multifaceted sources of financing wind power projects in Zimbabwe. These sources need to be explored jointly and in combination in order to ensure that there are high chances of success. Government financing, International Climate Finance Facilities, private sector investors and Development Finance Institutions (DFIs) should be greatly explored. Public Private Partnerships (PPPs) can also be explored including Build Operate and Transfer (BOT) Models. Innovative finance instruments can be developed learning from experiences of other countries



which have established Green Funds or Renewable Energy financing facilities. Projects from Non-Governmental Organisations (NGOs) can also enable a transition towards scaling up wind power.

How to address asymmetric information amongst stakeholders?

Investors act on information that is availed to them, therefore the need to package our investment portfolio for renewable energy in a compelling manner. In the case of renewable energy, both local and international investors require factual information on the availability of the specific energy resource. In the case of wind energy; it is now imperative that research centres, universities, consultants, think-tanks and other energy experts work in collaboration with the Ministry of Energy and Power Development in order to fast-track the assessment of the country's wind energy resources. Stakeholders with information should also share this with other key stakeholders such as the Ministry of Energy and Power Development and also Zimbabwe Energy Regulatory Authority (ZERA). Sharing information ensures that there is a collaborative approach in issues of energy. Private sector players are also encouraged to complement efforts of government in the drive towards clean and renewable energy taking the lead in investing in renewable energy.

The modern wind turbine typology

As we pursue the possibility of wind power generation in Zimbabwe, we must be guided by what the best practice is across the world. This ensures that our projects are comparable. The 3 blade wind turbine remains the most reliable and cost effective in the world. These turbines can have between 80 to 100 metres diameter. Such wind turbines can generate energy or between 2 to 3MW at a minimum of 80 metres in height. These typologies could yield between 7000 to 10 000MWh on an annual basis. Smaller turbines tend to generate less energy than large ones. Small turbines are those classified to generate less than 100KW.

As a rule of the thumb, small turbines are costly to maintain in comparison to large turbines. Other variants of turbines exist which need further investigation.

Possible Environmental Impacts

The positive environmental impact is the fact that wind power reduces emissions and also reduce the effects of climate change. These positive impacts can ensure that the country can achieve its targets such as the Nationally Determined Contributions (NDCs). Zimbabwe has committed to reducing emissions from the energy sector by 33%. Wind projects are associated with environmental impacts which require mitigation. Although studies worldwide have confirmed that wind projects

generate an average noise level of about 50 Decibels (dB), there have been no confirmed effects on hearing loss. The noise generation exists and it is hard to ignore. There have been environmental impacts related wind projects regarding death of birds, due to collisions with wind turbines. In planning for wind projects, mitigation measures should be crafted to deal with these negative environmental issues in order to make the wind projects sustainable. Potential investors intending to invest in wind energy in Zimbabwe should develop Environmental Management Plans (EMP) to deal with these environmental impacts. Moreover, Environmental Impact Assessments (EIA) should be carried out for wind projects in accordance to national policy requirements.



EXTREME GREEN BUILDINGS - BAHRAIN CASE



HOW EXTREME CAN WE GO IN GREENING OUR ECONOMIES? THE KINGDOM OF BAHRAIN SEEMS TO HAVE AN ANSWER THROUGH EXTREME GREEN BUILDING DESIGN.



WORLD TRADE CENTRE BAHRAIN LOCATED IN MANAMA, THE CAPITAL CITY OF BAHRAIN, STANDS TALL WITH THREE WIND TURBINES GENERATING WIND ENERGY. In a world where energy security and emission reductions have taken centre stage, the case study of green building design in Bahrain gives evidence of the momentum gained by sustainable architecture. The green architectural marvel stands tall with 50 storeys and 240 metres in height, the first of its kind to integrate wind technology into building design.

Many countries can learn lessons on how to integrate architecture with environmental sustainability. If green building design is successfully scaled up, taking a leaf from Bahrain, it is quite clear that the carbon footprint of buildings will be reduced. History was made in 2008 when the building became the first building to be integrated with wind turbines.

Designed by leading architects Atkins, the World Trade Centre Bahrain is the epitome of building sustainably.

The three wind turbines have proven capability of generating a combined wind power of a magnitude of 675 KW – each turbine contributing 225 KW. Between 11 to 15 percent of the energy needs of the building are met by the wind power generated through the wind turbines. The azure skyline of Manama is blessed to have the wind turbines supported by the twin towers, making it stand out amongst all buildings in the skyline of Manama, the capital of Bahrain.

The building is evidence that buildings can integrate sustainable and green concepts. The result is massive reduction in greenhouse gas emissions. Dubbed the jewel of the Arabian Gulf, Bahrain takes the lead in mainstreaming sustainability in buildings.



Photo: Tawanda Muzamwese



ENVIRONMENTAL DISASTER – “MV WAKASHIO” SPILLS OIL IN MAURITIUS

by Tendai Guvamombe

THE WORLD WOKE UP TO A DISASTER ON THE 25TH OF JULY 2020 WHEN LEADING AQUATIC STARLINER VESSEL MV WAKASHIO CRASHED ONTO A CORAL REEF AND RAN AGROUND CLOSE TO MAURITIUS.

Although crew was successfully evacuated, the events that have transpired a few days later, are pointing to a major environmental catastrophe with oil leaking into the Indian Ocean thereby affecting the Island Nation of Mauritius. It is estimated that the carrier was carrying close to 4000 tonnes of oil.

An environmental destruction of aquatic organisms and habitats is underway with many species being immobilised. Local efforts are underway to try and clean-up the area with stakeholders, government, volunteers and NGOs being involved in one way or another.

A local NGO Casela Nature Parks has made announcement that it will be providing shelter for birds and assist in their care, clean-up and rehabilitation. Residents of the Island nation now fear for the worst as the spillage of oil spreads in its precincts.

Preliminary efforts are involving use of sugarcane leaves and straw to act as an absorbent material to create barriers for containing the spillage.

Owned by the Japanese shipping company Nagashiki Shipping, believed to be registered in Panama, it is clear that this incident of MV Wakashio will shake Mauritius and its ability to deal with emergency situations. It is the first time that Mauritius is facing an unprecedented environmental disaster of such magnitude.

International NGOs and environmentalists have raised their ire over the disaster as having cast a dark cloud in the efforts to conserve pristine aquatic environments.

The incident has generated media fever, grabbing the attention of Global Media Institutions, thereby making the MV Wakashio case, a running story.

Amid all the media frenzy, global stakeholders have expressed anxiety at the nature of the oil spillage, as the future of aquatic life is in peril. The incident will have far reaching effects on biodiversity of wetlands, especially in the precincts where the vessel has stood motionless for over a fortnight.

The cargo ship is reported to have leaked more than 1000 tonnes from its 4000 tonnes of fuel.

Meanwhile, the Mauritian leader, Pravid Jugnauth has since declared

the incident a "State of Environmental Emergency".

The small island is incapacitated to respond to the emergency and France is reported to have come to the rescue.


Remarks by French President, Emmanuel Macron are a testimony of how global leaders are indebted to issues of biodiversity and the environment.

"When biodiversity is in peril there is urgency to act. France is there, alongside the people of Mauritius. You can count on our support dear Jugnauth", says French President Emmanuel Macron on his micro-blogging twitter account.

Nagashiki Shipping, owners of the vessel claim to have mechanisms devised to mitigate the impacts of the oil spillage. "Oil prevention measures are in place and an oil boom has been deployed around the vessel."

The MV Wakashio oil leakage in Mauritius adds to the statistics of the escalation of oil spillages that have occurred in the past in different locations across the world.

Most of these were scientifically proven to cause the destruction of habitats meant for birds, marine mammals, sea turtles and dozens of fish.



"When biodiversity
is in peril there is
urgency to act." -
Emmanuel Macron

A large patch of leaked oil travels on ocean currents near the Pointe d'Esny in Mauritius. The worsening oil spill is polluting the island nation's famous reefs, lagoons and oceans.
© AFP VIA GETTY IMAGES



MINING AND THE ENVIRONMENT – SMALL SCALE MINERS URGED TO ADOPT SUSTAINABILITY

Photos: Jack Chimbetete, (JSI International)

MINING IS A KEY ENABLER OF SOCIO-ECONOMIC DEVELOPMENT IN BOTH DEVELOPED AND DEVELOPING COUNTRIES. IT IS ALSO A KEY SOURCE OF GENERATING FOREIGN CURRENCY. HOWEVER, IF MINING ACTIVITIES ARE CARRIED OUT WITHOUT ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT, THERE IS A RISK OF ENVIRONMENTAL DEGRADATION.

The Green Business Gazette takes a brief analysis of the environmental impact of mining activities in order to raise greater awareness amongst key stakeholders. Environmental degradation, deforestation and air pollution and impacts that should be dealt with by all stakeholders in the mining sector especially emerging mining enterprises.

The exposure to hazardous chemicals is also a key risk especially when it comes to mercury which is used in gold amalgamation. Reckless use of mercury can have toxicological impacts. In as much as we want to increase productivity of mining activity, it is essential that mining and mineral processing be carried out in an environmentally sustainable manner.

Programmes to replace vegetation, fill gullies and restore pristine lands should be well planned. Impacts of mining can also result in drowning of human beings and livestock, if water fills pits that are left unattended.

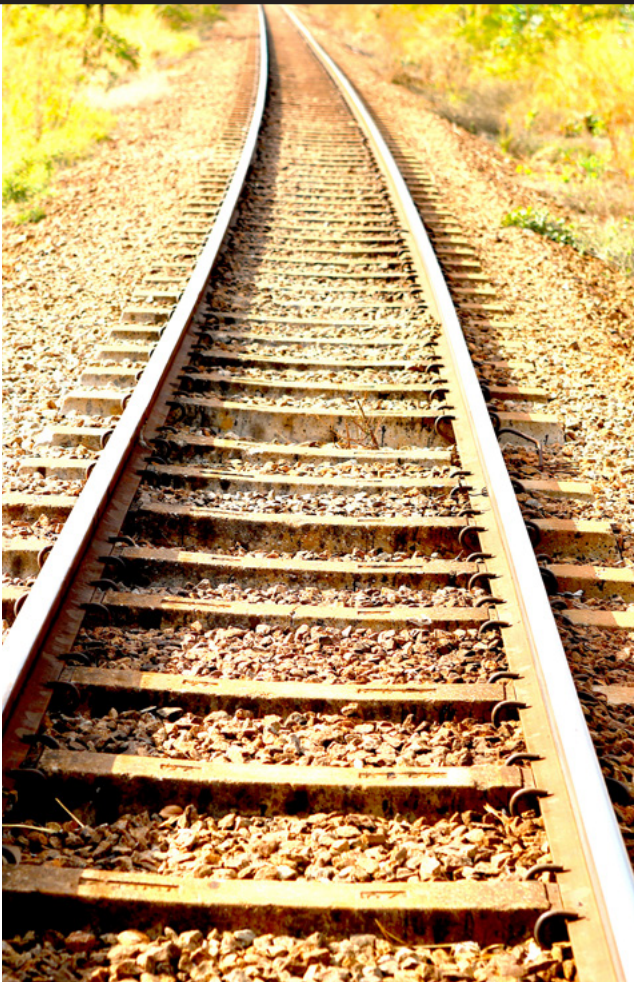
In order to access investment and financial support, it is imperative that mining operations follow environmental and social management plans. Major financial institutions have made environmental sustainability a condition for releasing funds.

Areas such as Penhalonga, Mazowe and Shurugwi have a hive of small scale mining activities and the clarion call is to ensure that sustainable mining is espoused into their activities. The analysis carried out by the Green Business Gazette in Penhalonga noted concern in the level of environmental degradation and implores training and capacity building in responsible mining activities. In order to ensure sustainable socio-economic development in the country, it is necessary to promote environmentally friendly mining.





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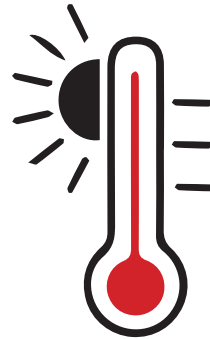
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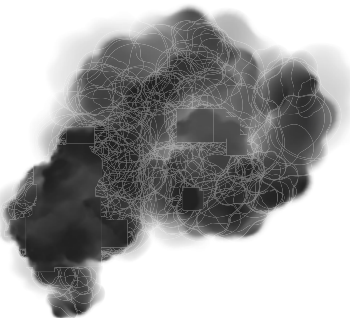
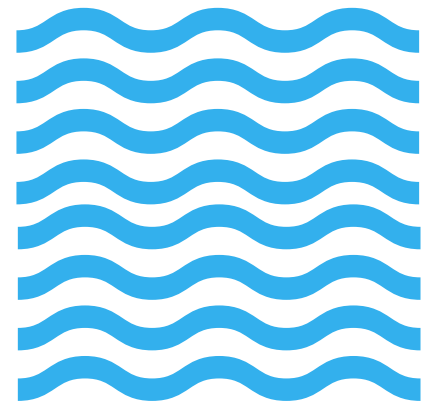
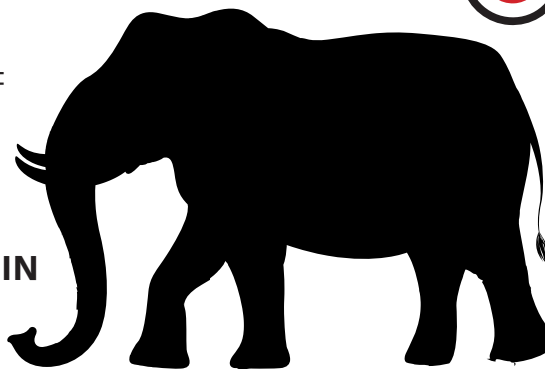
Global temperatures will rise by 2°C by 2030 if climate change is unabated



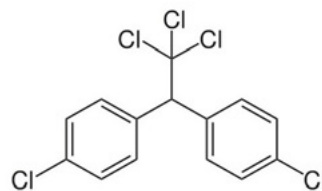
THE EFFECTS OF CLIMATE CHANGE COULD RESULT IN SEA LEVEL RISE BY 90CM IN COASTAL COUNTRIES.

AN ELEPHANT HAS A GESTATION PERIOD OF 22 MONTHS BEFORE GIVING BIRTH

AN ELEPHANT CAN LIVE UP TO 60 YEARS IN THE WILD AND 80 YEARS IN CAPTIVITY



Exposure to smog can increase the chances of low birth weight



DDT

Dichlorodiphenyl trichloroethane

The pesticide (dichloro-diphenyl-trichloroethane) DDT can pass to children through breast milk, in areas where DDT is used for malaria control



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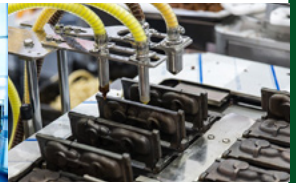
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